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Finance, growth and social fairness

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Publication date:
2014

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):
Sucre Reyes, M. A. (2014). *Finance, growth and social fairness: Evidence for Latin America and Bolivia*. CentER, Center for Economic Research.

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Finance, Growth, and Social Fairness: Evidence for Latin America and Bolivia

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June 30, 2014

Finance, Growth, and Social Fairness: Evidence for Latin America and Bolivia

Proefschrift

ter verkrijging van de graad van doctor aan
Tilburg University op gezag van de rector magnificus,
prof.dr. Ph. Eijlander, in het openbaar te verdedigen ten
overstaan van een door het college voor promoties
aangewezen commissie in de aula van de Universiteit op
maandag 30 juni 2014 om 14.15 uur door

Maria Antonieta Sucre Reyes

geboren op 6 september 1975 te Cochabamba, Bolivia.

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To my parents, German and Graciela.

To my husband, Wilco and my children, Femke, Maaïke, and Lex.

To my sister, Edna and my brothers, Pablo and Marcelo.

Acknowledgments

The conclusion of this thesis not only means reaching a titanic academic goal, but it also represents the closing of an important and challenging period of my life. Through these years of my doctoral project I have been trying to reach a balance between academic, work, and personal goals. I am quite fortunate for all that I have learned about economics and life during this (long) time, but even more privileged for all the precious moments that I have experienced as the mother of three lovely children.

I am deeply grateful to my supervisors, Prof. dr. Henk van Gemert and Prof. dr. Lex Meijdam. Thanks to all their support, patience, and guidance this project is now reaching its conclusion. Being their student has been a great honor. I appreciate and admire them not only for their professional profiles but also who they are as persons. Their constructive and wise minds have encouraged this thesis through all its stages and have also helped when the time came to confront difficulties and challenges. They have come alongside me in bringing to fruition this huge academic goal but also indirectly in understanding and supporting my personal goals.

I would also like to thank to Prof. dr. Jeffrey James, who has been present throughout my post-graduate education. First he supervised my Master's thesis, and after some years in the last stages of my PhD project he has served as the advisor for the last chapter of the present dissertation. During my last stays at Tilburg University I could always pass by his office to have a chat, and even when I have been in Bolivia he has been always kind and helpful by replying promptly to my e-mails, giving me many constructive comments and suggestions. Lastly, I am grateful to him for accepting a seat on my PhD committee.

My thanks also to the other members of my committee: Prof. dr. Thorsten Beck, Prof. dr. Robert Lensink, and Prof. dr. Clemens Kool. I appreciate their interest in my work and their insightful comments on my manuscript. Their questions and suggestions have helped a lot in improving the thesis. Each committee member contributed in his own way by commenting from his own perspective. During my master and doctoral program I had already met them through several of their publications, and it has been great to have them in person as my committee. I am proud to have such a prestigious group of evaluators.

Tilburg University provided a great research environment, and I would like to thank the staff and faculty members for their kindness and assistance. At the beginning and in the process of my research, I have knocked on the office doors of people such as Prof. dr. Vasso Ioannidou, Prof. dr. Arthur van Soest, and Prof. Jan van Ours. I am grateful that they gave me the time for a talk or replied to my e-mails when I was far away from The Netherlands. In the last years of my program I have also received the support of various staff members at Tilburg University. I am particularly grateful for the assistance and warm encouragement of Dr. Bertha Vallejo, Project Manager at the Tilburg School of Economics and Management (TiSEM). She has arranged various administrative and logistic issues related to my PhD thesis during the last 4 years. Neither will I forget the sympathy and assistance of some office managers, such as Ank, Loes, Anja, Corine, Yvone and Nicole.

As an external PhD candidate at Tilburg University, although I attended various 2 or 3-month intensive academic stays in The Netherlands, I carried out most of the research in Bolivia parallel to my work

(teaching) and family duties. Therefore, I have also had the support and encouragement of some people in Bolivia to whom I would also like to express my gratitude.

I want to thank Dr. Carmen Ledo, the coordinator of the Center of Planning and Management (CEPLAG) at Universidad Mayor de San Simón in Cochabamba, Bolivia. For more than 3 years I have been a PhD candidate fellow at this research center. She has given me her institutional support and practical advice, and she has encouraged me to go on in difficult situations when I felt like “throwing in the towel.” She has provided me a work space at the CEPLAG and has been available in her office for a talk even after my fellowship position finished in the center. Her optimism and confident personality is something that always infused me with positive energy and hope.

Special and heartfelt thanks to my husband for pushing me to pursue this goal. He was the one who persuaded me to apply for the doctoral program at Tilburg University. He always believed in me, even when I felt like digging a hole and I had no hope in my PhD project. He also had to tolerate many times my bad mood when I felt frustrated or tired. His typical easygoing and positive approach to life helped me to convince myself that all was doable or fixable. These years have not been an easy ride; as a married couple and being parents of three children, we have had to confront several challenges and obstacles. I feel that we both learned a lot about life and strengthened our commitment to each other and to our family.

I would like to express my gratitude to my parents for their unconditional support in this period of my life and for always being for me during these years. They have always been the cornerstone of my life, supporting my choices and advising me with their parental wisdom. Since I was a small child I have seen in them the best example of perseverance and effort, and at the same time a model of loving, dedicated parents. They did their best to not only give me a good education but also to teach me what is really valuable in life. ¡Gracias, pa y ma, ustedes siempre serán mi adoración y mi fuente inagotable de inspiración!

I would also like to offer my special and warm thanks to my three children. During these years they provided unforgettable and unique moments. Although there were also difficult moments to face with them as a mother, they very often made me feel like the happiest woman on earth. They have been born and grown up with their mother trying to achieve her professional challenges while at the same time trying to give them the number one place in her life. I am very grateful that God blessed me with such lovely children. They are one of the best things in my life, the storm and the rainbow of my existence. In the last few years, despite their young ages they have also been my personal coaches, cheering me up with their magical encouraging words or even by sharing their smiles with me.

My two brothers and my sister also deserve my gratitude. They have always been an important part of my life. Although they did not exactly understand why and what I was doing as a PhD student, they often supported me with a word and their caress as well as sometimes covering my absences with my children. On various occasions I was able to concentrate on my work and my thesis duties knowing that my children were in the best hands. ¡Gracias por todo, hermanitos, los quiero mucho!

I am also grateful to my parents in law. They believed in me and supported me with their caress and positivism.

Last but not least, I want to thank God. He has always guided me and given me strength...

Contents

Chapter 1

Introduction	1
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Chapter 2

Does financial development lead to economic growth and reduce inequality in Latin America and the Caribbean?	5
Abstract	5
2.1 Introduction	6
2.2 Theoretical Considerations	9
2.2.1 Theoretical considerations regarding the finance-growth relationship.....	9
2.2.2 Theoretical considerations regarding the finance-inequality relationship.....	15
2.3 Empirical Evidence Review	16
2.3.1 Empirical evidence on the finance-growth relationship.....	17
2.3.2 Empirical evidence on the finance-inequality relationship	21
2.4. Growth, Inequality, and Finance in Latin America and the Caribbean.....	22
2.5 Methodology and Data	31
2.6 Results and Discussion.....	35
2.6.1 Financial development and economic growth	36
2.6.2 Financial development and inequality	44
2.7 Conclusions.....	47
References	49
Annexes	55

Chapter 3

Access to finance, growth, and poverty: An empirical analysis for Bolivia	95
Abstract.....	95
3.1 Introduction.....	96
3.2. Theoretical and Empirical Considerations.....	101

3.2.1	The challenge of measuring access to finance.....	103
3.2.2	Microfinance and the poor.....	106
3.2.3	Country case empirical evidence on the finance-growth and finance-poverty relationships.....	107
3.3	Some Considerations about the Bolivian Financial System.....	115
3.3.1	The structure of the financial system.....	115
3.3.2	From financial repression to financial liberalization.....	118
3.3.2.1	The stage of financial repression before the application of the New Economic Policy.....	119
3.3.2.2	The New Economic Policy and financial liberalization.....	121
3.3.3	The microfinance miracle.....	124
3.4	What Data Say about Access to Finance in Bolivia.....	129
3.4.1	Recent regulatory measures related to access to finance.....	133
3.5	Methodology and Data.....	133
3.6	Results and Discussion.....	141
3.6.1	Access to finance and economic growth.....	142
3.6.2	Access to finance and poverty.....	147
3.7	Conclusions.....	150
	References.....	152
	Annexes.....	159

Chapter 4

	Alternative financial access mechanisms in Bolivia: The promising role of value chain finance.....	165
	Abstract	165
4.1	Introduction	166
4.2	Review of Related Literature	170
4.2.1	Microfinance, rural and agricultural (farm) finance	171
4.2.2	Main aspects of global commodity chains.....	173
4.2.3	Finance and global value chains: The promising role of value chain finance in addressing access to finance	175
4.2.3.1	Value chain governance and its role in access to finance.....	178

4.2.3.2 The role of foreign direct investment in access to value chain finance	180
4.2.3.3 The roles of trust and social capital in access to finance	182
4.2.4 Some main characteristics in the financing of small and medium firms	183
4.2.4.1 The determinants of financial obstacles for small and medium firms: International trends	183
4.2.4.2 Access to finance and firm innovation	184
4.2.4.3 The role of trade credit	184
4.3 Methodology and Data	185
4.4 Main characteristics of the dairy value chain in Cochabamba, Bolivia	187
4.5 Value Chain Finance in the Dairy Chain in Cochabamba, Bolivia	194
4.5.1 Main value chain financial mechanisms	194
4.5.1.1 Direct value chain financial mechanisms.....	194
4.5.1.2 Indirect value chain financial mechanisms.....	197
4.5.2 Governance, FDI, upgrading and value chain finance.....	198
4.5.3 The role of social capital on value chain finance	201
4.5.4 Evaluating the impact of a value chain financial access facility on the farmer segment.....	203
4.5.4.1 Econometric results	204
4.5.5 More about finance along the segments of the dairy chain in Cochabamba.....	206
4.5.5.1 Milk farmer segment.....	206
4.5.5.2 Processor segment	211
4.5.5.3 Trader segment.....	215
4.5.5.4 Consumer segment.....	217
4.6 Conclusions.....	218
References	220
Annexes.....	225

Chapter 1

Introduction

Over the last two decades, the role of finance in promoting economic growth and social fairness has received increasing attention in the economic literature. In the early 1990s King and Levine came up with a new and rigorous model to assess this relationship. Their approach was based on three components: endogenous growth theory, a modern view of financial intermediation, and advanced econometric techniques. Numerous empirical studies have appeared since then to estimate the impact of financial development on economic performance in terms of output, capital accumulation, productivity, and income distribution. In the beginning cross-country regressions were dominant, but later sector and industry level studies were carried out as well. Moreover, more rigorous econometric tools were adopted to shine a light on causality, and endogeneity and measurement problems were addressed by setting up large world-wide datasets. Levine's seminal chapter in the Handbook of Economic Growth (2005) presented an excellent overview of the stance of the literature. Meanwhile, researchers at the World Bank drew attention to financial access as an important mechanism driving both the relationship between finance and growth and the relationship between finance and poverty. As a result, the profession continued investigating the "finance and growth nexus" while incorporating this comprehensive concept. Next, the crisis arrived. A new and deeper perspective on the role of finance gradually emerged that mitigates the previous appraisals and policy recommendations. This process of reevaluating the optimal size of a financial system is still fresh and far from being conclusive.

An important limitation of the mainstream research on the finance and growth linkages is that most empirical investigations rely predominantly on general evidence based on international, pooled data sets. A major lesson of financial liberalization experiences worldwide, however, is the necessity for economic and financial policies to be based on a careful consideration of country characteristics. Indeed, some of the newest studies confirm that the impact of finance differs across regions and across countries and therefore stress the need for empirical knowledge at the regional and country case level. This thesis takes this need seriously.

Our case study centers on Bolivia, a country for which the relationship between finance, growth, and social fairness turns out to be particularly important. The country exhibits one of the lowest growth rates in the region and is seen as one of the poorest and most unequal countries in Latin America and the Caribbean. Poverty and inequality are not only deeply rooted in the country but they are also among the most distinctive features of the region. Currently, Latin America is regarded as the most unequal in terms of income and the fourth poorest region in the world (World Bank, 2012). In general, economic growth in Latin American countries has not met expectations, regardless of significant institutional reforms and an inherent potential to fare better. Consequently, the identification of factors that would promote economic growth and social fairness in Bolivia and the region becomes transcendental and necessary.

Considering this context, the present dissertation aims to evaluate the impact of finance on prosperity and social fairness in Bolivia and Latin America. At the same time, the study seeks to contribute to the scarce regional and country-level research in this field. With this purpose in mind, the existing theoretical and empirical literature has been reviewed and original empirical evidence prepared.

Moreover, the goal of this research is to conduct an integral investigation that does not rely only on macroeconomic evidence (at the regional and country case level) but also uses microeconomic evidence regarding the role of finance in a value chain context.

Throughout the thesis, different dimensions of finance such as financial depth, access to finance, and institutional diversification have been taken into account. Several of these aspects of finance have just recently been studied in the empirical literature. In this respect, observing the limited access to finance for certain agents in Bolivia – in particular, small-sized firms and rural and poor households – we have also considered value chain finance as an important alternative for making financial services accessible.

A key element of our work relates to the indicators of access to finance. The few attempts to measure this aspect of finance are very recent and sadly have significant limitations. One of these limitations is that they do not take into account the financial services supplied by non-bank deposit institutions. In this respect, it is important to realize that non-bank regulated and non-regulated deposit institutions account for a significant share of the financial system in countries such as Bolivia. Therefore, it was necessary to include this type of financial institutions when preparing and analyzing the financial access proxies.

As stated earlier, another innovative element of this dissertation is associated with value chain finance. With traditional and new sources of credit (i.e. microcredit) being limited or even closed to low-income and rural agents, value chains are appearing as an alternative to provide access to finance. Value chain finance breaks with the prerequisite of hard collateral to access credit. The existent business relationships between the chain actors replace the need for hard collateral. When a buyer with a reputation as a creditworthy purchaser or processor is willing to vouch for its suppliers (farmer or producers), even small agents become more attractive clients to financial institutions. As one might expect, limitations to credit provision are fewer, the terms and services are better, and the loans reflect the cash flow pattern of the business activities of the actors that are part of the value chain (UNCTAD, 2004; USAID, 2005; Conn et al., 2010).

Three comprehensive studies form the structure for this thesis. First, following this introduction, Chapter 2 reviews the large amount of theoretical and empirical work on the finance-growth relationship and the finance-inequality relationship. Additionally, given the economic and social peculiarities of Latin America and the need for a fresh look at the evidence (De la Torre, 2012), we examine and estimate both relationships for this region. With this purpose in mind, cross-sectional and panel data analyses are executed covering data on financial development, economic growth and inequality for Latin American and Caribbean countries. Our main findings suggest that financial development matters a lot for economic growth in the region. In the case of inequality, the evidence is mixed and even looks contradictory. On the one hand, cross-sectional outcomes support the hypothesis that financial development reduces inequality, but on the other hand, panel data results indicate the contrary. Therefore, it is likely that financial development reduces income inequality in the very long run while it raises inequality in the medium and long run. It is also possible that when evaluating the role of finance on growth and social fairness, other dimensions of finance such as access may be more important than depth or efficiency.

Specifically, the need to assess other dimensions of finance in addition to depth and efficiency is taken up in the next chapter. An important consideration in Chapter 3 is that financial development does not necessarily mean that finance is available for all on an equal basis. Based on these considerations, this paper reviews recent literature related to the issue of access to finance and its effects on growth and poverty. Then, given the economic and social peculiarities of Bolivia and the need for country case evidence, the relationships between finance and growth and between finance and poverty are investigated for this country, with the access dimension of finance playing an explicit role in the

regression equations. After presenting a contextual analysis of Bolivian financial intermediation, a cross-sectional analysis is executed over more than 300 Bolivian municipalities, covering proxies of access to finance as the explanatory variable, indicators of economic growth and poverty as the dependent variable, and a set of control variables. Among these control variables that influence growth or poverty – apart from financial access – geographical conditions are considered as a newly developed control variable. Our main findings indicate that access to finance is a significant factor in spurring economic growth and poverty reduction in Bolivia. Additionally, the contextual and econometric analyses highlight the role of microfinance institutions in the promotion of growth and the alleviation of poverty in the country. Among these MFIs, it is worth stressing the role of nongovernmental organizations (NGOs) and other semiformal institutions. Moreover, the Bolivian experience with microfinance as well as the historical evolution of its financial system from financial repression to financial liberalization suggests that the role of the government in building an effective and inclusive financial system should focus on regulation and on promoting the supply of financial services rather than on ownership and direct control.

The main findings of Chapter 3 support the hypothesis that in developing countries such as Bolivia, inclusive finance initiatives such as microfinance and financial intermediary diversification have had a positive effect on economic growth and poverty reduction. Yet we must also recognize that financial access is still very limited for many agents such as small and micro-sized firms and also rural and poor individuals in Bolivia. Therefore, when searching for alternatives to make finance accessible for these types of agents, Chapter 4 stresses the importance of value chain finance as an alternative to enable and extend financial access for those actors (mainly micro, small, and rural agents) who are usually left unserved by the financial system.

In Chapter 4, after reviewing the current diverse literature related to the topic, our original empirical evidence looks at the case of the dairy chain of Cochabamba, Bolivia. In this value chain case, after identifying its main characteristics we find which types of financial mechanisms are actually available to value chain actors. In general, access to finance appears to be an important factor in determining the upgrading of the whole chain and particularly in improving the situation of poor actors such as milk farmers. Sustaining this statement, based on original panel data evidence we found a positive effect of expanding access to credit – through an indirect value chain finance instrument – on the production patterns of milk farmers. Our case study analysis also reveals that poor actors – mainly small milk farmers – have very remote chances of accessing finance if they are not part of a value chain. The contractual relationship that farmers have with a large or “creditworthy” actor appears to be the “magical key” that enables certain financial access mechanisms for them. Therefore, direct and indirect value chain financial mechanisms act as a way to access finance. However, our case study also identifies some limitations of value chain finance, indicating the necessity to strengthen indirect value chain finance by means of the financial system. Additionally, our case study analysis also reveals the important influence exerted by value chain governance and social capital on financial access for poor actors of the value chain.

In Chapter 4, we see that the set of financial characteristics of the actors/firms involved in the dairy chain in Cochabamba is quite consistent with previous literature regarding international patterns of financing for small and medium firms. In the case of Bolivia, we find that larger, older, and foreign-owned firms face fewer financial constraints. The most innovative actors in the chain are those who have more access to external finance and foreign direct investment participation. Although trade credit and other informal finance exist as alternative finance mechanisms, these financial instruments have their limitations since they only meet short-term finance needs. While most short and long-term capital of micro and small producers is self-financed, we should realize that self-finance limits specialization, adoption of better technology, and productivity growth.

The results of this dissertation have implications for the design of financial and social policies at the regional and country case level. In the case of Latin America and the Caribbean, our results confirm that a more efficient financial system will have a positive effect on economic growth. This finding is still consistent with post-crisis empirical literature (Arcand, Berkes, & Panizza, 2001; Cecchetti & Kharroubi, 2012), which predicts that above a certain level, financial development can become a drag for the economy. As far as we know, financial systems in Latin America are far from being “too large.” Therefore, it is likely that financial development continues to be a powerful pro-growth instrument for the region.

Our case study of financial access in Bolivia shows the positive effect of a more inclusive and diversified financial system, not only in terms of growth but also in terms of social fairness. In this sense, it is important that the country keeps advancing on this path of making financial services more accessible to all. As a contribution to this process, the role of government should focus on regulation and stimulation, but also on the promotion of competition among financial institutions.

As stated earlier, it is evident that access to financial services is still limited in Bolivia. Therefore, value chain finance appears to be an alternative in these cases. However, in order to take advantage of these mechanisms it is important to promote the participation of these agents in value chains. Additionally, since value chain finance is highly related to the mainstream financial system, it is necessary for financial institutions to take a value chain approach. Traditional financial intermediaries offer a fixed set of loans without considering that agents are often part of a value chain. In this sense, bank and non-bank institutions should understand that the risk associated with a particular actor (i.e. small producer) can be estimated by regarding the risks and the competitiveness of the chain in which the agent is participating.

Furthermore, our case study shows that in operational terms, farmer associations play an important role in both direct and indirect value chain finance. In the case of indirect finance, the associations act as a kind of intermediary between the formal financial institutions and the farmers. Therefore, it is important to promote the formation and consolidation of “efficient farmer associations.”

Finally, we have also found evidence that foreign direct investment can have not only positive “spillover” effects on the economy in terms of output, employment, technological innovation, and efficiency, but also in terms of promoting alternative mechanism of finance for micro, small and medium-sized firms, as is the case of value chain finance. In this sense, it is essential as part of pro-growth and pro-social fairness policies to promote an attractive and proper scenario for foreign direct investment in the country and the region.

References

- Arcand, J. L., Berkes, E., & Panizza, U. (2011). *Too much finance?* The Graduate Institute. IMF & UNCTAD.
- Cecchetti, S., & Kharroubi, E. (2012). Reassessing the impact of finance on growth. *Bank for International Settlements (BIS) - Working Papers, No. 381*.
- Coon, J., Campion, A., & Wenner, M. (2010). Financing agriculture value chains in Central America. Washington, D.C.: Inter-American Development Bank.
- De la Torre, A., Ize, A., & Schmukler, S. (2012). *Financial development in Latin America and the Caribbean: The road ahead*. Washington, D.C.: World Bank Publications 2012.
- Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. Durlauf (Eds.), *Handbook of Economic Growth* (pp. 865-934). Elsevier.
- UNCTAD (2004). *Financing commodity based trade and development: Innovative agriculture financing mechanisms*. Report prepared by the UNCTAD secretariat for the Expert Meeting on Financing Commodity-Based Trade and Development: Innovative Financing Mechanisms. Geneva, 16–17 Nov. 2004.
- USAID (2005). *Value chain finance*. RAFI Notes 2. United States Agency for International Development. Washington, D.C.
- World Bank (2012). *World Development Indicators, 2012* [Dataset]. Retrieved from www.worldbank.org.

Chapter 2

Does financial development lead to economic growth and reduce inequality in Latin America and the Caribbean?¹

Abstract

Over the last 20 years, the role of finance in promoting economic growth and reducing inequality has received increasing attention in the economic literature. Some of the latest studies in this area suggest that its impact differs across regions and types of economies (Goaied, 2010; Barajas et al., 2012; Andersen et al., 2012), giving rise to a need for more specific empirical knowledge at the regional and single country levels. Additionally, it is evident that the last financial crisis has spawned a skeptical assessment of the finance-growth nexus. The present paper reviews the bulk of empirical work on the relationships between finance and growth and between finance and inequality. Additionally, given the economic and social peculiarities of Latin America and the need for a fresh look at the evidence (De la Torre, 2012), we examine both relationships for this region of the world. For this purpose, cross-sectional and panel data analysis are conducted using data of proxies of financial development, economic growth, inequality, and other control variables for Latin American and Caribbean countries. The main findings suggest that financial development matters for economic growth in the region. The results seem robust to different measures of financial development and sets of control variables. In the case of inequality, the evidence is mixed and even appears contradictory. On the one hand, cross-sectional results support the hypothesis that financial development reduces inequality, and on the other hand, panel data analysis suggests the opposite. Therefore, it is possible that financial development acts as an income equalizing factor in the very long term, while it raises inequality in the medium and even long term. It is also likely that at the moment of evaluating the role of finance on growth and social fairness, other dimensions of finance such as access to and diversification of financial services (for a given level of depth) should be more relevant. In this way, there is the necessity to consider and evaluate other aspects of the financial system that are at least as important as financial development.

¹ An earlier version of this chapter was presented at the international conference “*Tercer Encuentro de Economistas de Bolivia*” that took place in Cochabamba, Bolivia on 7 and 8 October 2010 and was organized by the Central Bank of Bolivia. The version presented at this event is available at: <http://www.bcb.gob.bo/3eeb/sites/default/files/Papers%203EEB%20-%20CD/MASucre-financial%20development.pdf>

2.1 Introduction

The relationship between financial development and economic growth has remained an important issue of economic debate. The pioneering contributions concerning this relationship are from Schumpeter (1912), Goldsmith (1969), McKinnon (1973), and Shaw (1973). A significant number of theorists, starting with Schumpeter, have emphasized the role of financial development in better identifying investment opportunities, reducing investment in liquid but unproductive assets, mobilizing savings, boosting technological innovation, and improving risk taking. However, not all are convinced about the importance of the financial system in the growth process. According to Lucas (1988), economists are “badly over-stressing” the role of financial factors in economic growth. Robinson (1952) synthesized the view of those who are skeptical about the role of finance as a growth factor when she wrote, “Where enterprise leads, finance follows.” In this view, economic growth creates demands for particular types of financial arrangements, and the financial system responds automatically to these demands (Bhattacharya & Sivasubramanian, 2003; Zang & Kim, 2007; Asongu, 2011).

Among other important and recent theoretical-empirical studies that have stressed the role of finance on growth are those by McCaig (2005), Levine (2005), Bertocco (2008), Dawson (2008), Brezigar, Coricelli, and Masten (2008, 2010), Lee and Islam (2008), Vaona (2008), Acaravci, Ozturk, and Acaravci (2009), Beck, Büyükkarabacak, Rioja, and Valev (2009), Caporale, Rault, Sova, and Sova (2009), Dabos and Williams (2009), Ghimire and Giorgioni (2009), Kiran, Yavuz, and Güriş (2009), Yay and Oktayer (2009), Antonios (2010), Goaid and Sassi (2011), Arcand, Berkes, and Panizza (2011), Asongu (2011), Bezemer (2011), Demetriades and Rousseau (2011), Ductor and Grechyna (2011), Fowowe (2011), Hassan (2011), Rachdi and Mbarek (2011), Andersen, Jones, and Tarp (2012), Barajas, Chami, and Rezaal (2012), Cecchetti and Kharroubi (2012), Oluitan (2012), and others. Specifically, one of the latest works of Levine refers to theoretical models showing that financial intermediaries and markets may arise to mitigate the effects of information and transaction costs. Therefore, financial systems may influence saving rates, investment decisions, technological innovation, and hence long-term growth rates. Also, Levine makes a critical review of empirical studies on finance and growth, concluding that we are still far from a definitive answer to the questions: Does finance cause growth, and if it does, how? (Levine, 2005)

In the last few years, after the recent crisis, concerns have increased that some countries may have financial systems too large in comparison with the size of their domestic economies and that in that situation more finance will give place to less growth. Specifically, the hypothesis that above a certain level financial development would become a drag for the economy is reflected in the work of Arcand et al. (2011), Ductor and Grechyna (2011), and Cecchetti and Kharroubi (2012). However, it is important to mention that this statement is not new. Already in the decade of the 1970s, studies such as those by Minsky (1974) and Kindleberger (1978) refer to this possibility. Later, other authors such as Easterly et al. (2000) and Rajan (2005) (as cited in Arcand, Berkes, & Panizza, 2011) also consider this hypothesis. Easterly et al. (2000) show that there is a convex and non-monotone relationship between financial development and economic growth, and even their estimations suggest that output volatility starts increasing when credit to the private sector reaches or surpasses 100% of GDP. Rajan (2005) also touched on the vulnerabilities of financial development, suggesting that too much finance would increase the probability of a “catastrophic meltdown” (Arcand et al., 2011).

In general, as a weak point, most of the empirical research on finance and growth relies excessively on general evidence (see Annex 2.1). One important general lesson of the financial liberalization experience is the need for policy to be based on a careful consideration of country conditions and differences. A “one size fits all” approach to financial policy needs to be replaced by the design of financial sector interventions that allow for the significant differences that exist in the economic and institutional characteristics of individual developing countries (Kirkpatrick, 2005). This issue points to

the need for cross-country econometric analysis to be complemented by more broad-based empirical evidence derived from regional (i.e. Latin America and the Caribbean) and single country studies. Specifically, recent studies such as the ones of Lee and Islam (2008), Dabos and Williams (2009), Goaid (2010), Barajas et al. (2012), and Andersen et al. (2012) suggest that there is considerable heterogeneity in the effect of financial development across regions and countries. Therefore, there is an urgent necessity for empirical evidence at the regional and single country levels.

As we will show in our review of empirical literature (Section 2.3), another important limitation of the existing empirical research on finance and growth is the concentration on the single objective of economic growth. But what if financial development benefits only the rich and powerful people? In comparison with the studies regarding the link between finance and economic growth, there has been little research about the relationship between financial development and inequality (see Annexes 2.1 and 2.2). Considering “socially fair development,” it is important to take into account that financial development could have distributional and poverty impact implications.

In this respect, Demirgüç-Kunt and Levine (2009) argue that economists underestimate the potentially important effect of finance on inequality. The authors note that while a growing body of theoretical and empirical research suggests that financial sector policies would have a first order impact on inequality, still many economists perceive financial markets’ imperfections as fixed. Even in some theories, credit constraints are erroneously seen as exogenous. Therefore, with finance regarded as unchanging, some theoretical and empirical models concerning inequality (i.e. Becker & Tomes, 1979; Galor & Zeira, 1993; Mookherjee & Ray, 2003)² proceed to consider how human capital, fertility rate, inflation, and other variables affect inequality, giving rise to policy recommendations that ignore finance as an additional equalizing instrument. It is evident that in reality, finance is not unalterable and that diverse dimensions of financial systems such as depth, access, and diversification would have a pronounced effect on inequality.

Despite inequality and poverty being very different things, there is evidence that inequality matters are related with poverty. In this sense, it is important to mention that for a given level of mean income, greater inequality generally means greater poverty or, even worse, that for a given rate of growth in mean incomes, greater inequality usually implies a slower rate of poverty reduction. In this respect, Beck, Demirgüç-Kunt, and Levine (2007) show that financial development may affect the poor by means of two channels: aggregate growth and changes in the distribution of income. Additionally, there is evidence that inequality is associated with greater prevalence of conflict and violence and may impair an economy’s ability to respond effectively to macroeconomic shocks (De Ferranti, Perry, Ferreira, & Walton, 2004).

Evidence also shows that poverty and inequality can undercut growth itself. So inequality not only prevents the poor from benefiting from growth but can also lower economic prosperity for a whole country and region. Nevertheless, taking these financial frictions as given and ignoring incentive effects, some recommendations to reduce income inequality only suggest public policies redistributing income from the rich to the poor. Much less emphasis has been put on financial development policies as a way to reduce income inequality (Beck, Demirgüç-Kunt, & Levine, 2007).

In reference to this last issue, although theoretical models make distinct predictions about the relationship between financial sector development and income inequality, little empirical research has been conducted to compare their relative explanatory power (Clarke, Xu, & Zou, 2003; Demirgüç-Kunt & Levine, 2009). Part of this is a data problem, since inequality indicators are not available for all countries and the time period covered by datasets is relatively limited. Additionally, it is also important to consider the presence of data inconsistencies in most of the cross-country datasets about inequality. Widely known and consulted international datasets such as Wider-UNIDO, Deininger

² As cited in Demirgüç-Kunt & Levine (2009).

and Squire, and Dollar and Kraay have important quality deficiencies. The main shortcoming relates to the fact that despite all the data resources measuring inequality, the definitions vary among and within countries. Therefore, these different definitions would compromise comparability between cases and bias results estimations (Lubker, Smith, & Weeks, 2002).

The issue of finance in the Latin American and Caribbean region is particularly interesting and important if we note that practically all their countries are considered to be developing economies. Economic growth in Latin American countries has not met expectations, regardless of significant institutional reforms and their inherent potential to fare better. Poverty and income inequality remain high and deep-rooted to the extent that the region is regarded as the most unequal in the world in terms of income. Indeed, one of the most distinctive features of Latin America and the Caribbean is its high degree of inequality. Few economic and social variables are as closely associated with the region as inequality. Living standards vary markedly among citizens both between and within countries. The region was already characterized by sharp income inequality before the debt crisis and structural reforms of the 1980s and 1990s, when inequality rose in most countries. However, it seems that around 2000, the rising trend in inequality came to a halt in some Latin American countries such as Brazil, Bolivia, Argentina, Venezuela, Peru, Chile, and El Salvador (De Ferranti et al., 2004; Lustig, Lopez-Calva, & Ortiz-Juarez, 2011).

In a certain way, many political and economic experiments that took place in the region in the last century have been perhaps motivated by the search for a model that would reduce inequality and poverty. Some of these political and economic efforts consisted of waves of heavy government intervention and protectionism, followed by privatizations and market-oriented reforms, followed recently in some countries by the undoing of market reforms and the nationalization of natural resources. Among the many reforms implemented in developing countries in the last 30 years, the liberalization and expansion of financial markets has been prominent. Latin American and Caribbean economies practiced "financial repression" policies for around four decades, from the 1940s to the 1970s. There was a significant government presence in the financial system reflected in state-owned financial institutions with directed lending to chosen sectors and interest rate ceilings with the purpose of raising investment and growth. Financial liberalization came at the end of the 1970s expanding financial markets in the region. However, compared to other developing regions, even in a scenario of financial liberalization, financial indicators have lagged behind those of other developing regions such as East Asia (Canavire & Rioja, 2009).

While the overall region is on its way to meeting the Millennium Development Goals relating to human development, it lags behind on achieving the poverty goal, as does Sub-Saharan Africa (Saavedra & Arias, 2005). Therefore, it is crucial for the region to identify and analyze factors that could promote economic growth and reduce income inequality and poverty (Blanco, 2007).

Given this necessity, the main goal of the present paper is to analyze the effect of financial development on economic growth and income inequality in the Latin American and Caribbean region. Toward that end, most of the existing empirical evidence published in the period 1993-2012 was reviewed with a focus on both relationships (finance-growth and finance-inequality). Additionally, since very few empirical analyses use samples that pool countries of the same region and even fewer studies focus on the Latin American region, we attempt to approach empirically both relationships for the case of Latin America and the Caribbean. This last task has been challenging not only considering the complications involved in building and analyzing panel datasets, but also due to certain peculiarities of the data in terms of availability and consistency.

Methodologically and in order to guarantee heterogeneity, one could think that the most optimal plan is to use a sample with countries of the entire world. However, we should consider that a specific regional level study could also offer heterogeneity. Despite losing the heterogeneity provided by the differences between different world regions (i.e. East Asia and Latin America), within the Latin

American and Caribbean region we can find significant variations across countries and across time. For example, if we regard the level of private credit as a percentage of GDP (as an indicator of financial development) in the period 1970-2004, the lowest level value in the region corresponded to Haiti (4%) and the highest level to Panama (41%). For the period 2005-2009, St. Lucia is at the top of the region with a level of 95%, while Argentina is at the bottom with 12%³. But the Latin American and Caribbean region is not homogenous, either in terms of its financial systems or in terms of income levels, resource endowments, and development levels, among other aspects.

In light of this, and in order to exploit the maximum number of observations and the maximum level of heterogeneity across countries in the region, the present work covers practically all the economies of the region (around 30). Perhaps this fact could be a strong point in our study in relation to others (i.e. Nazmi, 2005; Blanco, 2007; Bittencourt, 2010) that also approach the case of Latin America but consider only 5 to 12 countries. Even in a very recent work (Venegas-Martínez & Rodríguez-Nava, 2014) that analyzes the finance-growth nexus for Latin America, only the seven higher-income countries of the region are considered⁴. Additionally, in order to exploit not only variations across countries but then also variations across time, we complement our pure cross-sectional analysis with a panel data analysis. By combining time series of cross-sectional units (i.e. countries), panel data models offer more data (despite a small number of observations), more variability, more degrees of freedom, and more efficiency.

Although a larger number of countries would be better and desirable in terms of heterogeneity and efficiency, we should also consider that a smaller sample of countries has its advantages. It is likely that by selecting countries of a specific region of the world or with similar economic condition (developed or developing), we could control better for some socioeconomic, cultural, geographical, and other conditions than when pooling countries from different regions or economic conditions. However, taking out such differences as developed-developing or African-Latin American and therefore focusing on a group of similar countries brings with it a cost in terms of losing variability. Nevertheless, such a loss of variability is relative given the existence of important differences across countries and across time within such a group (i.e. the Latin American and Caribbean region).

The study is organized into seven sections. In the one that follows this introduction, some theoretical considerations regarding the finance-growth and finance-inequality relationships are briefly discussed. An empirical review summarizing the existing empirical works published on both relationships is presented in Section 3. In the next section, we attempt to present somewhat of a condensed diagnosis regarding some indicators of growth, finance, and inequality in the region. In Section 5, the most important points in terms of methodology and data related with our research are introduced. In the sixth section, the main results of our data econometric analysis are presented for both relationships and considering two different econometric techniques (cross-sectional and panel data analysis). Then finally, we present the conclusions.

2.2 Theoretical Considerations

2.2.1 Theoretical considerations regarding the finance-growth relationship

Three hypotheses about finance and growth

Regarding the finance-growth nexus, Patrick (1966) labels two possible hypotheses between financial development and growth as the supply-leading hypothesis and the demand-following hypothesis. The supply-leading hypothesis states a causal relationship from financial development to economic growth. This effect is exerted by means of variations in productivity and capital accumulation. On the

³ Based on Beck and Demirgüç-Kunt (2012) dataset on finance indicators.

⁴ The countries are: Argentina, Brazil, Chile, Colombia, Mexico, Uruguay, and Venezuela.

other hand, the demand-following hypothesis postulates a causal relationship from economic growth to financial development. So according to this hypothesis, financial development does not autonomously affect economic growth. On the contrary, economic growth gives place to an increasing demand for financial services that might induce an expansion in the financial sector⁵. Followers of this approach – among them Robinson (1952) and Lucas (1988) – argue that financial markets and institutions appear when needed. Therefore, if economies grow, business demand for financial services increases and the financial system grows in response⁶.

In addition to these two competing hypotheses, Patrick (1966) proposes the stage of development hypothesis. According to this hypothesis, supply-leading financial development can induce real capital formation in the early stages of economic growth. Innovation and development of new financial services opens up new opportunities for investors and savers and, in so doing, inaugurates self-sustained economic growth. As financial and economic development proceeds, the supply-leading characteristics of financial development diminish gradually and are eventually dominated by demand-following financial development. Surprisingly, there has been little empirical analysis of Patrick's hypotheses, for either developed or developing countries (Calderon & Liu, 2005).

Regarding the supply-leading hypothesis, which seems the strongest in empirical terms, most of the literature points out that financial development causes economic growth by increasing productivity and capital accumulation. Additionally, empirical development economics shows that economic growth is mainly driven by productivity growth, rather than, as commonly thought, through capital accumulation. Indeed, an important way in which financial development could influence growth is by means of facilitating technological innovations and low-cost production methods that could increase productivity. First, the adoption of technologies requires large sums of capital that could easily be mobilized in well-developed financial systems. Second, well-developed financial systems encourage the adoption of long-gestation productive technologies by reducing investors' liquidity risks. Finally, by providing hedging and other risk sharing possibilities, financial intermediaries and markets influence the assimilation of specialized and hence productive technologies. So countries with well-developed financial systems will experience larger productivity gains and therefore higher economic growth (Taddese, 2005).

Early theoretical contributions on the supply-leading hypothesis

With regard to the supply-leading hypothesis, the early quotations refer to Schumpeter (1912), Bagehot (1920), McKinnon and Shaw (1973) (as cited in Khan, 2000; Levine, 2004), and others. Schumpeter pointed out that the services provided by financial intermediaries such as mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions are important to give rise to technological innovation and consequently to achieve economic development. Bagehot argues that the distinguishing characteristic of English financial markets was the relative ease with which they were able to mobilize savings to finance diverse long-term and illiquid investment projects. This relatively easy access to external finance for firms was critical in promoting the implementation of new technologies in England and therefore may have a positive effect on economic growth (Khan, 2000).

The McKinnon and Shaw model

McKinnon and Shaw (1973) presented a financial repression model that stresses the negative effects of ceilings on deposits and loan interest rates. The fundamental argument is that financial repression in the form of interest rate ceilings would constrain financial deepening and consequently economic growth. An interest rate ceiling that gives rise to low or negative interest rates basically has two

⁵ Nicholas Stern's (1989) survey of development economics does not even regard finance as a factor of economic growth.

⁶ See: Robinson, Joan (1952) "The Generalization of the General Theory" in *The Rate of Interest*, London (as cited in Khan, 2000).

negative effects. The first one relates to the reduction in savings and hence the amount of available loan funds that are intermediated through the financial system. The second negative effect would affect the marginal productivity of capital⁷. Financial intermediaries would not have incentives to ration credit based on marginal productivity considerations. So the most probable scenario is that they would ration credit according to their own discretion and this would impede the efficient allocation of investment funds. High reserve requirements and directed credit programs (which are also part of financial repression policies) further intensify these negative effects.

To summarize, the McKinnon and Shaw model regards financial repression as a disequilibrium phenomenon that prevents markets from clearing and serving their allocative function in an optimal way. Their policy recommendations would then be to liberalize the financial system and allow the market mechanism to determine the allocation of credit. Under this scenario, finance would have a positive impact on economic growth (Andersen & Tarp, 2003).

Enriching the contributions of Schumpeter, McKinnon, and Shaw, more recent theoretical works highlight the role of financial development as a promoter of growth. Early overviews of this theoretical literature are presented by Pagano (1993) and Levine (1997). These new theoretical considerations are based on endogenous growth models indicating that investment in research and development, in physical capital, and in human capital are major determinants of economic growth. Thus the core questions for growth are how to finance these investments and how financial intermediaries allocate funds (Gross, 2001). In this way, these theoretical considerations point to the channels linking finance and growth and the functions that are performed by the financial system⁸. Financial development will take place when financial intermediaries, markets, and instruments perform their financial functions well, influencing economic growth positively.

The Pagano model

For Pagano (1993) this positive effect of financial development on growth occurs mainly by means of three channels: the savings rate, the fraction of savings channeled to investment, and the social marginal productivity of capital. In order to capture these potential effects of financial development on growth, he considers a simple endogenous model, named the “AK” model. Pagano’s model is basically composed of four equations that make reference, respectively, to the determinants of aggregate output (equation 1) and gross investment (equation 2), the identity of saving and investment (equation 3), and the determinants of economic growth (equation 4).

$$Y_t = AK_t \quad (1)$$

$$I_t = K_{t+1} - (1-\delta) K_t \quad (2)$$

$$\phi S_t = I_t \quad (3)$$

$$g = A I/Y - \delta = A \phi s - \delta \quad (4)$$

In equation 1, the aggregate output is a linear function of the aggregate capital stock (AK). This production function is a reduced form of one of two frameworks regarded by Pagano. One is a competitive economy with external economies, where each firm faces technology with constant returns to scale but productivity is an increasing function of the aggregate capital stock K_t . In the other

⁷ McKinnon in Chapter 6 of his book *Money and Capital in Economic Development* shows the case of Ethiopia. In this country the government capped the nominal interest rate on bank loans at 12% in order to clear the market for investment loans. Consequently, an arbitrary system of loan allocation arose whereby firms in strategic industries targeted by the government experienced excessive investment, which generated poor returns for savers. Additionally, farmers were unable to obtain short-term loans from banks. Instead, they had to borrow from informal money lenders who charge interest rates between 100 and 200% (Khan, 2000).

⁸ One of the weaknesses of the McKinnon and Shaw model relates to the lack of explicit modeling of the link between financial and real sector variables.

framework, the AK model is obtained by assuming that K is composed of physical and human capital and these two types of capital are produced by identical technologies.

Additionally, in the model it is assumed that the population is stationary and that the economy produces a single good that can be invested or consumed. If this good is invested, it would depreciate at the rate of δ per period. So, the gross investment would be given by equation 2. In equation 3 the capital market equilibrium is reflected. Assuming a closed economy with no government, this equilibrium means that gross saving (S) equals gross investment (I). Additionally, Pagano assumes that a proportion of the savings ($1-\phi$) is lost in the process of financial intermediation due to repressive interventions by the government.

The first step of equation 4 is obtained on the basis of equations 1 and 2. Its second step uses the capital market equilibrium conditions specified in (3), with the gross saving rate S/Y denoted by s . However, the most important fact of equation 4 is that it reveals how financial development could influence growth. Indeed, this last equation shows that financial development could have a positive effect on economic growth by means of three channels. These channels, as we already mentioned, are the proportion of savings funneled to investment (ϕ), the social marginal productivity of capital (A), and the private saving rate (s).

The main functions of the financial system

To organize a review of how financial systems affect savings and investment decisions and hence growth, a seminal and comprehensive paper by Levine (2004) focuses on five main functions provided by the financial system. These functions are the following:

- To produce information *ex ante* about possible investment and to allocate capital
- To monitor investment and exert corporate governance after providing finance
- To facilitate the trading, diversification, and management of risk
- To mobilize and pool savings
- To facilitate the exchange of goods and services

Regarding the production of information and the allocation of capital, it is important to take into account that there are many costs associated with the evaluation of firms, managers, and market conditions before making investment decisions. Individual savers may not be able to collect, process, and produce this information. However, individual savers would be reluctant to invest in projects or activities with little reliable information. Therefore, high information costs may prevent capital from flowing to its highest value use. It is precisely because of this point that the role of financial intermediaries is important in reducing the cost of acquiring and processing information and consequently improving resource allocation. Without the existence of intermediaries, each individual investor would face large fixed costs when making investment decisions.

Greenwood and Jovanovic (1990) establish that financial intermediaries could have a positive effect on economic growth by improving information on firms, managers, and economic conditions. If we take into account that many entrepreneurs solicit capital and that this factor is scarce, financial intermediaries that produce better information would be able to fund more promising firms and induce a more efficient allocation of capital. Regarding this last conclusion, financial intermediaries may also boost the rate of technological innovation by identifying those entrepreneurs with the best chances of initiating new goods and production processes⁹. Additionally, stock markets would also encourage the production of information about firms. If we consider that markets become larger and more liquid, agents may have more incentives to expend resources getting information about firms.

⁹ This is already based on considerations by Schumpeter (1912) regarding the role of finance in the process of economic growth.

Indeed, for an agent who has this information it is easier to make decisions in the stock market (Levine, 2004).

With respect to the second function of the financial system, it is important to regard the effects of investment monitoring and corporate governance on economic growth. The degree to which capital providers can effectively monitor and influence how firms use that capital has implications on both saving and allocation decisions. If shareholders and creditors effectively monitor firms and induce managers to maximize firm value, the efficiency with which firms allocate resources will improve. Additionally, it will make savers more interested in finance production and innovation. On the contrary, without the existence of the financial system exerting a positive effect on corporate governance, there will be a significant limitation on the mobilization of savings for investment projects. Therefore, the effectiveness of corporate governance mechanisms has an effect on firm performance and consequently on economic growth.

Another important function of the financial system is the facilitating of trading, diversification, and management of risk. In this respect, Levine (2003) regards three types of risk: cross-sectional risk diversification, intertemporal risk sharing, and liquidity risk. With respect to cross-sectional risk, financial systems may relieve the risks related with individual projects, firms, industries, regions, countries, etc. Financial intermediaries and markets provide mechanisms for trading, pooling, and diversifying risk. The provision of these mechanisms can influence economic growth in the long run by affecting resource allocation and saving rates. While savers generally are risk-averse, high-return projects tend to be riskier than low-return projects. Therefore, if financial markets facilitate risk diversification for these agents, they would also tend to induce a portfolio shift toward projects with higher expected returns (Gurley & Shaw, 1995; Greenwood & Jovanovic, 1990; Saint-Paul, 1992; Devereux & Smith, 1994; and Obstfeld, 1994)¹⁰.

Regarding intertemporal risk sharing, the theory emphasizes the role of financial intermediaries in easing intertemporal risk smoothing. Long-lived intermediaries would lighten intergenerational risk sharing by making investments with a long-term perspective and offering returns that are relatively low in boom times and relatively high in slack times. Additionally, financial intermediaries would enable intertemporal risk sharing by reducing contracting costs.

The third component of risk, liquidity, would imply the costs and speed at which agents can convert financial assets into liquid cash at agreed prices. Liquidity risk increases because of the existence of uncertainties related with converting these assets into cash. These uncertainties are mainly related to the presence of asymmetric information and transaction costs that may restrain liquidity and consequently deepen liquidity risk. Therefore, the role of financial systems is crucial here for reducing these information asymmetries and transaction costs.

As we already mentioned, another important function of financial systems is the mobilization and pooling of savings. These actions involve the costly process of collecting capital from diverse savers with the purpose of supplying investment funds. Savings mobilization is mainly concerned with reducing the transaction costs related with collecting savings from different agents and overcoming the information asymmetries for savers who feel comfortable giving up supervision over their savings. Given the transaction and information costs related with mobilizing saving from diverse agents, multiple bilateral financial arrangements¹¹ may be established in order to ease these frictions and facilitate pooling. To minimize the costs associated with multiple bilateral contracts, pooling may also take place by means of financial intermediaries. Through these intermediaries, numerous investors entrust their wealth to intermediaries that invest in numerous other firms. For this to happen, “mobilizers” have to convince savers about the quality and soundness of the investment (Boyd &

¹⁰ As cited in Levine (2004, p. 16).

¹¹ These bilateral contracts will be arranged between productive units raising capital and savers who have a capital surplus.

Smith, 1992)¹². With this purpose, intermediaries may work on building a good reputation to win the confidence of savers.

Finally, regarding the function of facilitating the exchange of goods and services, financial contracts can promote specialization, technological innovation, and economic growth by lowering transaction costs. In this respect, Greenwood and Smith (1996) identified some important links between exchange, specialization, and innovation. On this matter, we have to recognize that specialization requires more transactions. If we take into account that every transaction implies costs, financial contracts that lower transaction costs will stimulate greater specialization. Therefore, financial systems that promote exchange through decreasing transaction costs may encourage productivity gains and consequently may have a positive effect on economic growth.

This review of the functions of financial markets, institutions, and instruments suggests that well-functioning financial systems stimulate the level and quality of investment and therefore may have a positive effect on economic growth.

2.2.1.1 Undesired effects of financial development: Crises vs. growth

Diverse theoretical and well-known works (McKinnon, 1973; Shaw, 1973; Hicks, 1969; Merton, 1989; Pagano, 1993) refer to the positive role of financial development on economic growth. However, after the latest financial crisis this positive effect has been called into question. Some economists argue that the risk of crisis would increase due to an overly large financial sector. Others point out that an overly large financial system would take away resources from the “real” sector. Therefore, although financial development would be pro-growth, there is also the possibility that beyond a certain limit financial development does not contribute to growth anymore. On the contrary, as in the situation when a person eats too much, it is possible that above a certain limit finance becomes a drag for economic growth (Cecchetti & Kharroubi, 2012).

Although the recent crisis has raised concerns about the possible negative effects of financial development, we must be aware that this thesis is not new. Already before 2007, some theoretical and empirical studies such as those by Minsky (1974), Kindleberger (1978), Tobin (1984), Easterly et al. (2000), Rajan (2005) (as cited in Arcand et al., 2011), Ranciere, Tornell, and Westermann (2006), and others refer to this kind of threshold above which financial development has a negative impact on development.

Minsky (1974) and Kindleberger (1978) focused on the relationship between finance and macroeconomic volatility, referring extensively to financial instability and financial manias. In the case of Tobin (1984), he regards not only increasing volatility but also a suboptimal allocation of talents as consequences of excessive finance. The author states that social returns of the financial sector are lower than its private returns, producing the possibility that a large financial sector may take talent from productive sectors of the economy, giving rise to inefficiency from society’s point of view. For his part, Rajan (2005) shows the dangers of financial development and suggests that a large and complicated financial system had given rise to an augmented probability of a “catastrophic meltdown.” Easterly et al. (2000) use empirical research to show a convex and non-monotone relationship between financial development and growth volatility. Their findings even suggest that such a volatility of output growth starts augmenting when the ratio of credit to the private sector to GDP reaches 100% (Arcand et al., 2011).

However, the fact that a large financial sector may raise volatility does not necessarily mean that strong financial development is bad. There is a possibility that economies with large financial systems have to pay a price in terms of volatility but as compensation they will be rewarded with higher growth. This is precisely the main idea of the work of Ranciere et al. (2006) on the dual effects of

¹² As cited in Levine (2004, p. 22).

financial liberalization. On the one hand, financial liberalization tends to relax borrowing constraints, leading to higher investments and higher economic growth. And on the other hand, it promotes risk taking, generating financial fragility and raising the probability of financial crises. The main novelty of the work of Ranciere et al. (2006) in comparison with previous research on financial liberalization and its impact on financial fragility¹⁵ is the unified approach, the consideration of both growth and crisis as two possible trade-off results of financial liberalization. Additionally, this study also presents empirical evidence consistent with its theoretical model. Based on data analysis of a large sample of countries, estimation results show that financial liberalization leads to faster average long-term growth, even though it also leads to occasional crises.

2.2.2 Theoretical considerations regarding the finance-inequality relationship

With respect to the relationship between finance and inequality, it is possible to distinguish three different hypotheses. These are the widening hypothesis, the narrowing hypothesis – also known as the linear hypothesis – and the inverted U-shaped hypothesis.

The widening inequality hypothesis

In the “widening inequality hypothesis,” financial development benefits only the rich and powerful. Because financial markets are fraught with adverse selection and moral hazard problems, borrowers need collateral. The poor, who do not have this, might therefore find it difficult to get loans even when financial markets are well developed. In contrast, the rich who do have property that can be used as collateral might benefit as the financial sector develops. Additionally, some research suggests that the poor mainly rely on informal and familiar financial connections; financial development would not have a great effect on them. Therefore, if financial development improves access for the rich, but not the poor, it may worsen inequality.

The narrowing inequality hypothesis

This might be different if we follow the “narrowing inequality hypothesis.” As the financial sector grows, the poor, who were previously excluded from getting loans, might gain access to them. In this way, finance might be an equalizer for people with talents, ambition, and persistence. Rajan and Zingales (2003) argue that the revolution in financial markets is “opening the gates of the aristocratic clubs to everyone.” Supporting the idea that financial development might benefit the poor, several theoretical models suggest that income inequality will be lower when financial markets are better developed. Indeed, Galor and Zeira (1993) and Banerjee and Newman (1993) suggest that long-term convergence in the income levels of the rich and poor will not necessarily happen in economies with capital market imperfections¹⁶ and indivisibilities in investment in human or physical capital. Depending on the initial wealth distribution, income inequality might persist.

Galor and Zeira (1993) built a model composed of two sectors with inheritances between generations, where agents who make an indivisible investment in human capital can work in a skill-intensive sector. Nevertheless, because of the existence of capital market imperfections, only individuals who have inheritances larger than the investment amount or who borrow will be able to make this type of investment. This will give rise to income inequality that is perpetuated through inheritances to the following generation. An economy with capital market imperfections and an initially unequal distribution of wealth will keep this inequality and grow more slowly than a similar economy with a more equitable initial distribution of wealth. The case of Banerjee and Newman (1993) considers a three-sector model in which two of the technologies require indivisible investment. Given capital market imperfections, only wealthy agents can borrow the amount necessary to execute these

¹⁵ Regarding literature on the link between financial liberalization and financial fragility, we can refer to Kaminsky & Reinhart (1998), Detragiache and Demirgüç-Kunt (1998), and Glick & Hutchinson (2001).

¹⁶ Among these financial market imperfections are informational asymmetries, transaction costs, and enforcement costs, which may be especially binding on poor entrepreneurs who lack collateral, credit histories, and connections (Beck, 2004).

indivisible and high-return technologies. Once again, in this model the initial distribution of wealth has long-term effects on income distribution and economic growth. Therefore, both models suggest that economies with larger capital market imperfections should have higher income inequality. So if financial development means the reduction of these market frictions, we could infer that financial development may reduce income inequality.

The main conclusion of the last two models mentioned can also be combined with the insights of Kuznets (1955) to suggest potential links between the sectoral structure of the economy, financial sector development, and income inequality. Concentrating on the transition from agriculture to industry, Kuznets supposed that there might be an inverted U-shaped relationship between income inequality and economic growth. As people move from the low-income, but more egalitarian, agricultural sector to the high-income, but less egalitarian, industrial sector, income inequality initially increases. Since at the beginning only a small percentage of the population benefits from the higher income opportunities in the modern sector, income inequality increases at the initial stage of economic development. Nevertheless, as more people adopt the new technology and as new entrants catch up with those who started earlier, this levels out and income inequality starts to fall (Clarke et al., 2003).

The inverted U inequality hypothesis

Finally, if we consider the “inverted U inequality hypothesis,” the relation between inequality and financial development could be non-linear, because different mechanisms dominate at different levels of financial sector development. Greenwood and Jovanovic (1990) show how financial and economic development might give rise to an inverted U-shaped relationship between income inequality and financial sector development. In their model, income inequality first rises as the financial sector develops but later declines as more people gain access to the system (Clarke, Xu, & Zou, 2006).

In the theoretical model of Greenwood and Jovanovic (1990), agents operate the more profitable, but riskier, of two technologies only when they can diversify risk by investing in financial intermediary coalitions. However, the fixed costs associated with these coalitions impede low-income agents from joining them. Supposing that poor individuals save less and consequently accumulate wealth slowly, income differences between agents who are involved in financial intermediary coalitions and outsiders will be wider, giving rise to an increase in income inequality. Nonetheless, since the entry fee is fixed, all agents eventually join these coalitions, leading to an eventual reversal in the upward trend. Therefore, as mentioned, Greenwood and Jovanovic’s model predicts an inverted U-shaped relationship between financial development and income inequality, with income inequality first increasing and later decreasing as more people join financial coalitions (Clarke et al., 2003).

2.3 Empirical Evidence Review

As we already mentioned, one important research component of the present study is the collecting and analyzing of existing empirical evidence. In this way, prior to making some important theoretical considerations, this part of the study attempts to conduct a review of recent empirical literature on the finance-growth and finance-inequality relationships. We focus on empirical studies that use cross-country, time series, and panel data techniques. In the case of the finance and growth nexus, our review starts with empirical evidence from 1993, since a new rigorous approach was initiated precisely that year by King and Levine (1993). In the case of the review of finance and inequality, there was no need for such a restriction since the literature is relatively scarce and in general the inequality issue reappeared on the research agenda in the 90s after some decades of relative silence.

The main goal of such a review is to find some preliminary answers to our research question. However, other important purposes are the identification of alternative proxies of finance, inequality, economic growth, and other variables that also have an influence on growth and inequality apart from

finance (control variables). Additionally, we have paid special attention to the econometric techniques applied in the recent empirical literature. This also makes it possible to identify the advantages and disadvantages of different econometric techniques and to consider which techniques to use in our work. A synthesis of all of the papers on finance-growth and finance-inequality that we collected and reviewed is available in Annex 2.1 and 2.2. In these carefully designed annexes, we summarize chronologically these empirical works, making reference to authors, main research goals, applied econometric techniques, variables and indicators used (explained and explanatory), and main findings or conclusions.

2.3.1 Empirical evidence on the finance-growth relationship¹⁷

The empirical literature on the relationship between financial development and economic growth is relatively ample. However, as we mentioned previously, this review was restricted to empirical evidence from 1993. The main reason for this time restriction relates to the new rigorous approach initiated by King and Levine (1993). Some important characteristics of this new approach are: a functional theory of financial intermediation, an endogenous growth theory, and advanced econometrics. These recent studies have applied different econometric methodologies and datasets to evaluate the role of finance on economic growth. In this review we focus on two types of different studies: a) cross-country empirical evidence that contains cross-sectional and panel data analyses and b) time series analyses¹⁸. Even though in the empirical literature we could also find interesting country case and industry/firm studies, they were not considered in this review, since the main focus of our research is the macro level. Additionally, in the case of the industry/firm studies, they usually confirm the conclusions of cross-country and panel data studies. Moreover, they are based on detailed data on firms and/or sectors, for which availability is quite limited in the case of Latin America and the Caribbean. The single country studies were left for the next chapter, which is dedicated to the specific case of Bolivia.

Cross-sectional and panel data analyses

With respect to cross-country studies, we have to look at, on the one hand, those that are pure cross-country studies and, on the other hand, those that combine cross-sectional and panel data techniques. As part of the first group of studies we can consider the work of: King and Levine (1993), Levine and Zervos (1998), Rajan and Zingales (1998), Levine (2000), Manning (2003), and Beck et al. (2009)¹⁹. It is around the beginning of the 2000s that the cross-country literature on the topic introduced more sophisticated models and econometric techniques to address biases provided by pure cross-sectional estimation (i.e. measurement error, reverse causation, and omitted variables). Therefore, since 2000 some of the empirical cross-country studies combine cross-sectional and panel data analyses, additionally considering in both types of estimations diverse measures to overcome reverse causation (Beck, 2008). Others exclusively exploit the use of panel data techniques.

As some of the studies that combine cross-sectional with panel data econometric techniques, we can mention those by: De Gregorio and Guidotti (1995), Levine, Loayza, and Beck (2001), Travelsi (2002), Favara (2003, 2007), Rioja and Valev (2004b), Rousseau and Wachtel (2008), Vaona (2008), Demetriades and Rousseau (2011), and Barajas et al. (2012). A strong point of these studies is that the use of both techniques enriches and gives more robustness to the empirical evidence. Additionally, the application of both methods could in a way mean running the analysis in different time horizons. In this way, the cross-country studies would imply a long-term analysis, since most of the authors

¹⁷ For a more detailed presentation of this review, see Annex 2.2.

¹⁸ A very comprehensive and critical review on pure cross-country regressions, panel data analysis, and microeconomic base studies is presented by Levine (2004).

¹⁹ Although this work of Beck et al. is relatively recent, the authors were limited to using cross-sectional analysis rather than panel data mainly because data restrictions did not permit them to have a panel dataset for the sample of 45 countries covered in the study.

worked from datasets that comprise data of an average of at least two decades. The data panel analysis could be more associated with the medium and in some cases with the short term²⁰ (Clarke et al., 2006).

As we can see in Annex 2.1, most of the existing pure cross-sectional studies use a pooled sample of developed and developing countries, even the last one of Beck et al. (2009). One of the few cross-sectional studies that focus on developing countries was presented by Travelsi (2002). In terms of data, most of these types of analysis are based on averaged data at a country level covering two to four decades. The exceptions are the works of Rajan and Zingales (1998), whose cross-sectional analysis is based on data of US companies over the 1980s, and Manning (2003), a study in which part of the empirical evidence is based on the same dataset of Rajan and Zingales (1998). In general, cross-sectional studies showed that financial development exerts a large and positive causal impact on economic growth.

Finally, with regard to the use of panel data techniques we can stress the work of: De Gregorio and Guidotti (1995), Allen and Ndikumana (1998), Benhabid and Spiegel (2000), Spiegel (2001), Trabelsi (2002), Rioja and Valev (2004a, 2004b), Favara (2003), Calderon and Liu (2003), Dawson (2003), Christopoulos and Tsionas (2004), Nazmi (2005), McCaig and Stengos (2005), Fink, Haiss, and Vuksic (2006), Ranciere et al. (2006), Blanco (2007), Favara (2007), Rousseau and Wachtel, (2007), Zang and Kim (2007), Ahlin and Pang (2008), Bertocco (2008), Brezigar et al. (2008, 2010), Vaona (2008), Acaravci, Ozturk, and Acaravci (2009), Caporale et al. (2009), Ghimire and Giorgioni (2009), Dabos and Williams (2009), Yay and Oktayer (2009), Antonios (2010), Goaid (2011), Arcand et al. (2011), Asongu (2011), Bezemer (2011), Demetriades and Rousseau (2011), Ductor and Grechyna (2011), Hassan, Sanchez, and Yuc (2011), Andersen et al. (2012), Barajas et al. (2012), Cecchetti and Kharroubi (2012), and Oluitan (2012). In a similar way as cross-sectional and time series studies, panel data evidence is based on general datasets that pool developed and developing countries. Some specific regional or group country evidence is presented for the cases of Southern Africa (Allen and Ndikumana, 1998), APEC (Spiegel, 2001), Africa (Favara, 2003; Oluitan, 2012), economies in transition (Dawson, 2003; Fink, Haiss, & Vuksic, 2006), European countries (Brezigar, Coricelli, & Masten, 2008 & 2010; Caporale, Rault, Sova, & Sova, 2009; Antonios, 2010), OECD economies (Ductor & Grechyna, 2011; Rachdi & Mbarek, 2011), Saharan Africa (Acaravci et al., 2009), MENA countries (Goaid, 2011; Rachdi & Mbarek, 2011), and Latin America (De Gregorio and Guidotti, 1995; Nazmi, 2005; Blanco, 2007).

Cross-country evidence for developing countries and Latin America and the Caribbean

Regarding specifically the case of less developed countries, Odedokun (1996) observed (via a sample of 71 developing countries) that financial intermediation promotes growth in about 85% of the countries. Another important conclusion of this study is that growth-promoting effects of financial intermediation are more predominant in low-income than in high-income less developed countries.²¹ Similar results were found in the work of Dawson (2008) over a sample of 58 developing countries by applying panel co-integration methods. Kiran et al. (2009), using a smaller sample of developing countries²², also finds evidence supporting the premise that financial development has a positive and statistically significant effect on economic growth.

The studies of Gregorio and Guidotti (1995), Nazmi (2005), Blanco (2007), and Bittencourt (2010) approach the specific case of Latin America. Bittencourt's work shows that the Schumpeterian prediction that finance leads growth seems to hold even in an extreme political and economic environment like the one seen in Latin America in the 1980s and 1990s. However, a weak point in the

²⁰ In some studies the data panel analysis is executed with annual and even quarterly data, so it is evident that the results reveal evidence for the short term. However, it becomes a bit erroneous to work with such kind of data since conceptually economic growth is a long-term phenomenon.

²¹ For more details, see Annex 2.2.

²² Ten countries including two Latin American in this sample (Peru and Mexico).

research of Bittencourt (2010) is that its empirical evidence is based on a sample of only four Latin American countries (while the region has around 30 developing economies). On the basis of a sample of 12 Latin American countries²³, De Gregorio and Guidotti found robust evidence of a negative relationship between financial intermediation and growth. Nazmi (2005) examined the impact of banking deregulation and financial deepening on capital accumulation and growth on the basis of annual data of five selected Latin American countries²⁴. In contrast to De Gregorio and Guidotti (1995), Nazmi's evidence suggests that financial development has played a positive and significant role in fostering investment and economic growth in Latin America. Blanco (2007), studying a sample of 12 Latin American countries for the period 1971-1998, concludes that financial development has no significant effect on productivity or capital growth for the full sample. Financial development only has a significant positive effect on productivity growth in upper middle-income countries. However, Blanco's study also finds that financial depth has a positive effect on the percentage of the population that completed secondary education. This would mean that the positive effect of finance is conditioned by a minimal level of human capital in the region.

Time series analyses

As examples of applications of time series techniques, we can mention the studies of: Demetriades and Hussein (1996), Odedokun (1996), Ram (1999), Luintel and Khan (1999), Xu (2000), Shan (2001), Shan and Morris (2002), Fase (2003), Ghirmay (2004), Boulila and Trabelsi (2004), Al-Awad and Harb (2005), Atindeou (2005), Dawson (2008), Lee and Islam (2008), Hassan et al. (2009), Rachdi and Mbarek (2011), and Fowowe (2011). Most of this literature is based on vector autoregression models (VAR) and causality econometric tests, although some of the most recent studies following this econometric methodology, such as Lee and Islam (2008), Hassan et al. (2009), Bittencourt (2010), Rachdi and Mbarek (2011), and Fowowe (2011), combine time series with panel data techniques.

The empirical evidence of time series studies is based mainly on different data samples: 1) mixed samples of developed and developing countries – including some selected from Latin America and the Caribbean and 2) samples of only developing countries or countries of an exclusive region or with common characteristics (Sub-Saharan Africa, Western Africa, Middle East Africa, North Africa, South East Asia, OECD, MENA, Latin America²⁵). With some exceptions given by Demetriades and Hussein (1996)²⁶, Shan (2001), Shan and Morris (2002)²⁷, Rachdi and Mbarek (2011), and Fowowe (2011)²⁸, most of the time series literature rejects the hypothesis that financial development simply follows economic growth and has very little effect on it. Instead there is strong evidence that financial development is important for economic growth.

Limitations of the existing empirical evidence and the need for "specific" research

As we can see, most of the existing empirical evidence points to financial development as a promoter of economic growth. However, as a limitation most of these empirical investigations seem to rely excessively on general evidence (international pooled datasets). In this respect, an important general lesson of the financial liberalization experience is the need for policy to be based on a careful consideration of country/regional conditions and differences. A "one size fits all" approach to financial

²³ Selected countries are not revealed in the study.

²⁴ These five countries are: Argentina, Brazil, Chile, Colombia, and Mexico.

²⁵ The panel time series study for Latin America is the one of Bittencourt (2011). However, the sample used of the econometric analysis only covers four countries of the Latin American region over the period 1980-2007.

²⁶ Evidence provides very little support for the view that finance is a leading sector in the process of economic development. Most of the evidence seems to favor the view that the relationship between financial development and economic growth is bi-directional (Demetriades & Hussein, 1996).

²⁷ They did not find evidence of causality in some countries of their sample (19 OECD countries and China), but they found evidence of reverse causality and bi-directional causality in others. The few countries in which they found evidence of one-way causality from financial development to economic growth were insufficient to draw general conclusions (Shan & Morris, 2002).

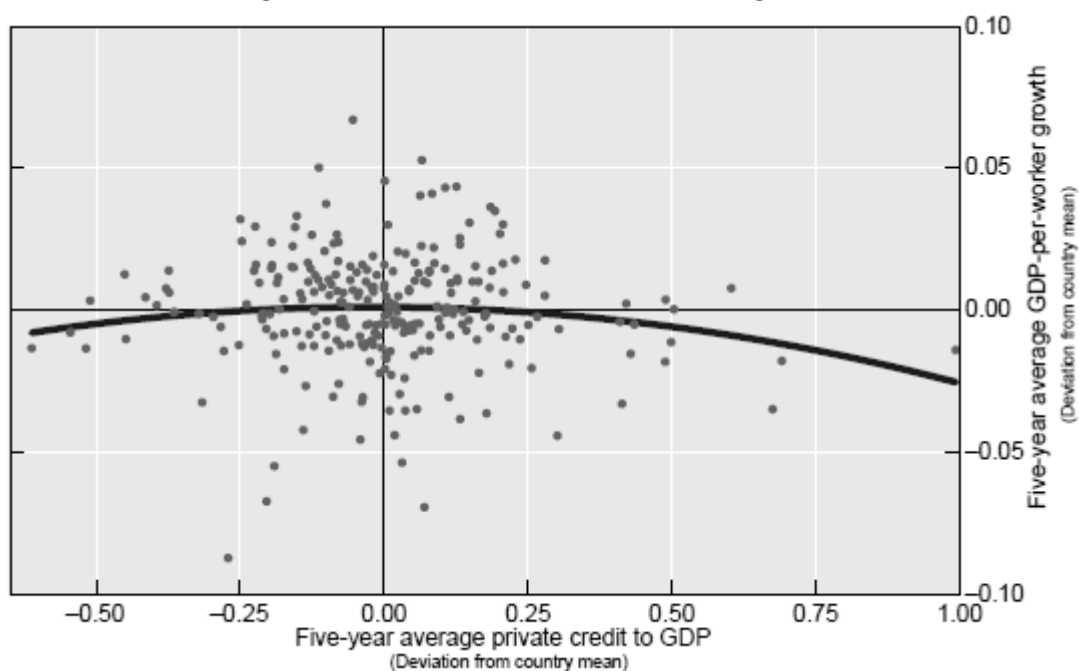
²⁸ These last studies, while finding a strong link between financial development and growth, also find a bi-directional causality in most of the countries that are considered in their samples.

policy needs to be replaced by the design of financial sector interventions that allow for the significant differences that exist in the economic and institutional characteristics of individual developing countries. In this respect, recent studies such as Lee and Islam (2008), Dabos and Williams (2009), Goaid (2010), Barajas et al. (2012), and Andersen et al. (2012) show that there is significant heterogeneity in the effect of financial development across regions and countries. Therefore, it is evident that there is a need for more empirical evidence at the regional and country case levels.

Additionally, if we take into account the existing specific evidence related to Latin America and the Caribbean, we can observe two main weak points. First at all, this empirical literature is scarce, and second, only a few countries of the region are considered in the study samples. Therefore the necessity and importance of complementary, fresh, and specific evidence about the Latin American and Caribbean region is clear.

Finally, it is impossible to neglect that the recent financial crisis has increased skepticism about the positive effect of finance on growth. Before the crisis – as we have seen in this review – in the empirical literature there was a strong conviction that more finance was always a good thing for the economy. However, some empirical research conducted after the crisis asserts the hypothesis that above a certain level financial development would become a drag for the economy. This statement is clearly reflected in the works of Arcand et al. (2011), Ductor and Grechyna (2011), and Cecchetti and Kharroubi (2012). Arcand et al. (2011) suggest that finance would start having a negative effect on output growth when credit to the private sector reaches 110% of GDP. The lesson of Cecchetti and Kharroubi (2012) is similar, showing that big and fast-growing financial sectors could be very costly for the rest of the economy. Overly large financial systems would draw in essential resources in a way that is detrimental to growth at the aggregate level. The hypothesis of Cecchetti and Kharroubi (2012) is very well illustrated in an inverted U-shaped curve that reflects the relationship between the size of the financial sector and the output growth for a pool of developed and developing countries. So, as we can observe in Figure 2.1, in the position of these authors, there is a point (around 100%) above which further enlargement of the financial system can reduce real growth. This is because the financial sector would compete with the rest of the economy for scarce resources. As a result, financial booms would not always be growth-enhancing.

Figure 2.1. Private credit to GDP ratio and growth



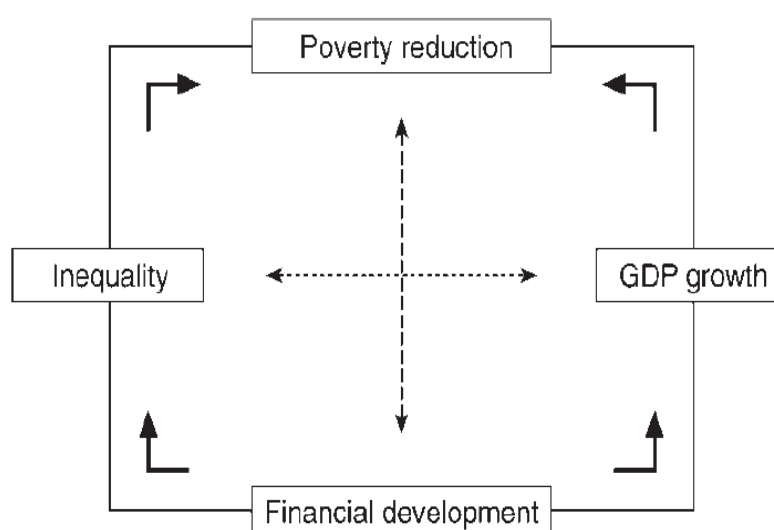
Source: Cecchetti and Kharroubi, 2012

2.3.2 Empirical evidence on the finance-inequality relationship ²⁹

As we already observed in the previous section, there is considerable empirical literature on the relationship between financial development and economic growth. However, we found much less evidence about the distributional and poverty impact implications of financial development than in the case of the finance and growth nexus. For some empirical studies on the relationship between finance and income inequality, we can refer to: Li, Squire, and Zou (1998), Jalilian and Kirkpatrick (2002), Dollar and Kraay (2002), Clarke, Xu, and Zou (2003, 2006), Lopez (2004), Beck et al. (2004b, 2007), Jalilian and Kirkpatrick (2005), Blanco (2007), Huang and Singh (2009), Canavire and Rioja (2009), Kappel (2010), Mookerjee and Kalipioni (2010), Rosner (2010), Asongu (2011), Batuo, Guidi, and Mlambo (2011), Cojocararu (2011), Sankar, Sarkar, Manpreet, and Vij (2011), Koeppl, Monnet, and Quintin (2011), Fowowe and Abidoye (2012), Humaira (2012), and Jauch and Watzka (2012)³⁰.

As a generality, these studies are based on econometric evidence from pooled datasets of developed and developing countries, except for some that look at regional cases such as Latin America (Blanco, 2007; Canavire & Rioja, 2009)³¹, Africa (Asongu, 2011; Batuo, Guidi, & Mlambo, 2011; Fowowe & Abidoye, 2012), and European transition economies (Cojocararu, 2001). For the econometric techniques used in these studies, cross-sectional and panel data analyses were conducted. Most of the empirical evidence, with the exception of Dollar and Kraay (2002), Lopez (2004), Rosner (2010), and Fowowe and Abidoye (2012), finds that financial development decreases income inequality. So, based on the existing empirical evidence, financial development could be regarded as a factor pointing to “social fairness.” Additionally, not much support is presented for the inverted U-shaped hypothesis, except for the works of Jalilian and Kirkpatrick (2005), Canavire and Rioja (2011), and Cojocararu (2011), whose results suggest that the link between financial development and inequality is quadratic (see Annex 1.2 for more details).

Figure 2.2 Interaction between financial development, growth, inequality, and poverty



Source: Jalilian & Kirkpatrick, 2005

²⁹ For a more detailed presentation of this review, see Annex 2.2.

³⁰ Additionally, there are a few specific country case studies that are not considered in this review. Those are the cases of Liang (2004), Motonishi (2004), Bittencourt (2006), Law (2009), Umesh (2011), and Shahbaz (2012), who studied the cases of rural China, Thailand, Brazil, Malaysia, India, and Iran, respectively.

³¹ The empirical analysis by Blanco (2007) covers a sample of only 12 countries for the period 1971-1998, and the study of Canavire & Rioja (2011) looks at the case of 21 Latin American countries for the period 1960-2005.

Summarizing, we have to stress again the relative scarcity of empirical literature on this relationship. In contrast, the relevance of the issue is ample³³. In this way, understanding this relationship will allow policymakers to assess whether financial development policies will reduce inequality and consequently poverty. Additionally, we have to consider that it is proven that deep poverty and inequality can also undercut growth. So inequality not only prevents the poor from benefiting from growth but can also lower economic prosperity for a country and a whole region.

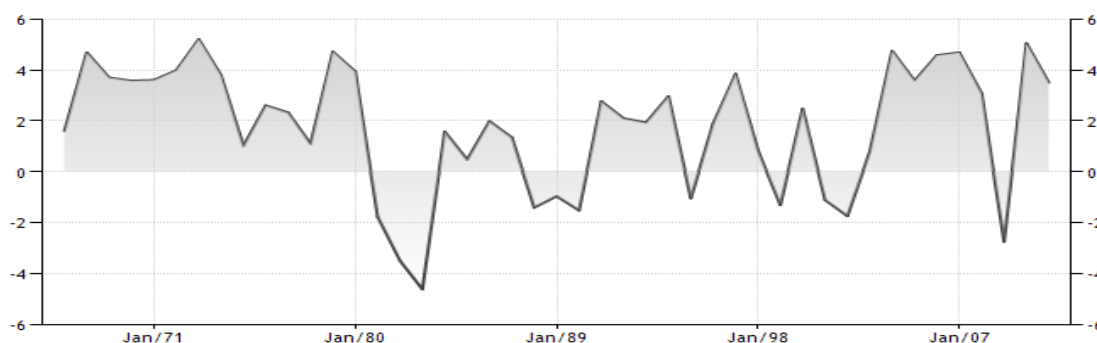
To finish this section, we can synthesize the main findings of our empirical review on both the finance-growth and finance-inequality relationships in Figure 2.2. As we can observe, most of the existing literature refers to financial development as spurring economic growth and diminishing income inequality. From this perspective, an important implication of these findings is that financial development would contribute to reducing poverty by accelerating growth and diminishing income inequality.

2.4. Growth, Inequality, and Finance in Latin America and the Caribbean

The insufficient growth rates of the Latin American and Caribbean region

At the global level, the growth rate of output per capita has showed a declining trend since the 1960s. In a way, this fact is a reflection of the trend of developed countries and their influence on developing countries. However, there are some important differences across regions regarding economic growth in the last four decades. Specifically, considering the developing world, on the one hand we have East Asia and the Pacific as the regions that exhibited the highest growth rates during the last four decades, despite their slight decline in the late 1990s. On the other hand, with unsatisfactory growth performances, there are Latin America and the Caribbean, Eastern Europe, Central Asia, the Middle East, North Africa, and Sub-Saharan Africa.³⁴

Figure 2.3. Latin America and the Caribbean: GDP per capita growth (% annual) (1967-2011)



Source: World Bank, 2012

Regarding the growth trend in Latin America and Caribbean in the last half century, as we can observe in Figure 2.3, the region experienced positive economic performance during the decades of the 1960s and 1970s. However, this positive picture became negative in the 80s, a time regarded by many authors as the “lost decade” for the region. Indeed, in this decade the GDP per capita diminished in average terms around 1% every year. Afterward, in general terms, the 1990s was a period of reform and slight recovery for the region, with economic growth per capita rates at around 2%. However, the last years of this decade and the beginning of the new millennium meant again a negative growth

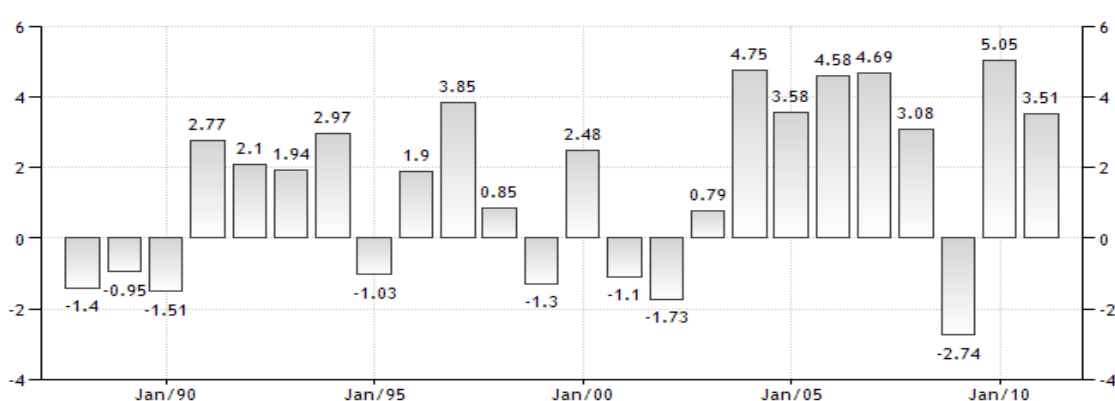
³³ High levels of poverty and inequality characterize much of the world. In 2001, 2.7 billion people lived on < \$ 2 PPP a day and 1.1 billion lived on < \$1. In South Asia and Sub-Saharan Africa, only one in four people live on more than \$1.

³⁴ The case of Sub-Saharan Africa is extreme if we regard their continuous negative growth rates, which seem to be the result of a combination of poor policies, social conflict, and negative external shocks (Loayza, Fajnzylber, & Calderon, 2004).

trend for Latin America and Caribbean. The crisis that was experienced at the end of 2001 and the beginning of 2002 significantly affected important economies of the region such as Argentina, Uruguay, and Venezuela and had repercussions on the whole region. Since 2004, the figures are somewhat optimistic since they have reflected positive rates with the exception of the Dominican Republic and Haiti.

Due to their macroeconomic fundamentals, most Latin American and Caribbean economies have been able to weather the crisis much better than other regions (as Europe and Central Asia). Already in 2009, risk spreads in the region had declined to near pre-crisis levels as investor confidence returned relatively soon. However, both industrial production and international trade volumes declined sharply, given the significant contraction in global demand. Additionally, falling commodity prices meant that the value of exports fell even more sharply, contributing to lower outputs and growth in many countries in the region (World Bank, 2010).

Figure 2.4. Latin America and the Caribbean: Growth rates of GDP per capita (1988-2011)



Source: World Bank, 2012

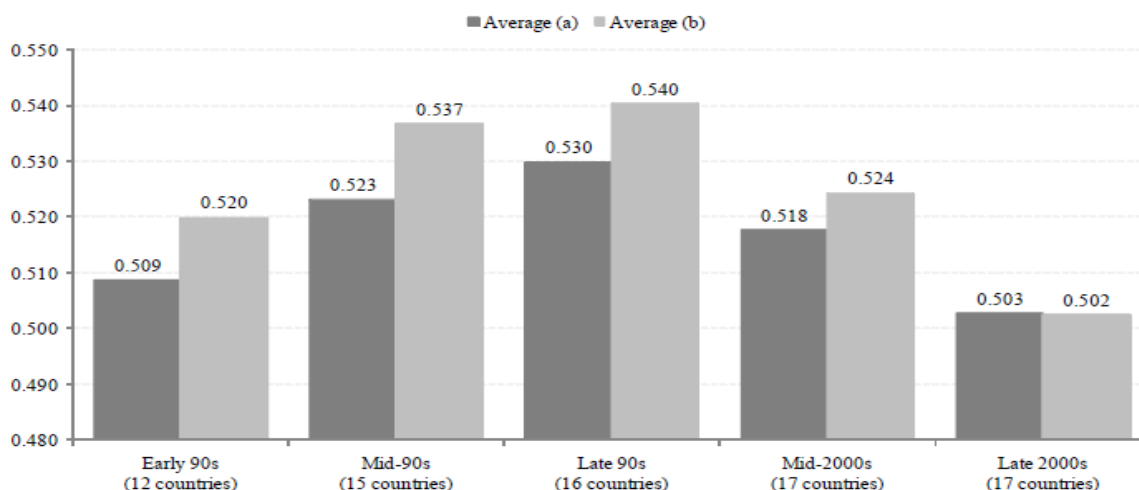
In general terms, we can conclude that the economic performance in the region has been highly volatile. This volatility decreased in the decade of the 90s as a result of some of the reforms promoted by the Washington Consensus regarding mainly monetary and fiscal discipline that meant stability for the region, although as we see in Figure 2.3 and 2.4, the volatility is still high and seems to have increased slightly due to the reduction of capital inflows to the region since the second half of the 1990s.

Latin America as the region with the highest inequality worldwide

Additionally, if we take into account the social fairness in the region, Latin America's income distribution is the most unequal of the world. So it seems that what economic growth the region has achieved has gone to those who already had a high income, and too little has gone to benefit those who really need it. Since 1980, the income distribution in the region has become more unequal. However, it seems that inequality diminished to a small degree at the beginning of the 1990s when Latin American countries recovered after earlier recessions. Figure 2.5 shows that the unequal distribution increased again in the mid and late 90s to give rise to a new decreasing trend during the 2000s (Morley, 2002; Lustig et al., 2011)³⁵. Despite this recent hopeful trend we must be aware that inequality remains high in the region (around 0.5 in terms of the Gini coefficient).

³⁵ In general, if we look at the different datasets on inequality income indicators, there is no consensus about the tendencies in income inequality in Latin America and other regions. Deininger & Squire (1996) and Dollar & Kraay (2000) are often referred to and used when comparing inequality between countries and regions, but the data quality is questioned by some authors:

Dollar and Kraay rely on 682 so-called high-quality observations from 108 countries, drawn from the Deininger and Squire (1996) dataset. To this they add 143 observations from Lundberg and Squire (1999) and the World Development Reports of 1999 and 2000... All of the data measure 'inequality', but the definitions vary among and

Figure 2.5. Latin America and the Caribbean: Evolution of the Gini coefficient since the 1990s

(a) For all countries; (b) For countries in which inequality declined in the 2000s

Source: Lustig et al., 2011

In fact, what is singular in the income distribution in the region is its lack of convergence over time. Inequality in Latin America fell slightly in the 1970s but increased again in the 1980s. If we look at other developing regions such as the Middle East, Africa, and East Asia, inequality fell substantially after the 1970s in these other developing regions. For example, in the case of East Asia for the period 1995-2005, the value of the Gini coefficient was around 0.4 (Canavire & Rioja, 2009). Therefore, Latin American and Caribbean countries continue ranking on top in inequality, which is not strange if we consider cases such as Bolivia, Honduras, Guatemala, and Brazil, where the gap between rich and poor is quite extreme (See Figure 2.6).

Finance as a factor that could spur growth and diminish inequality in the region

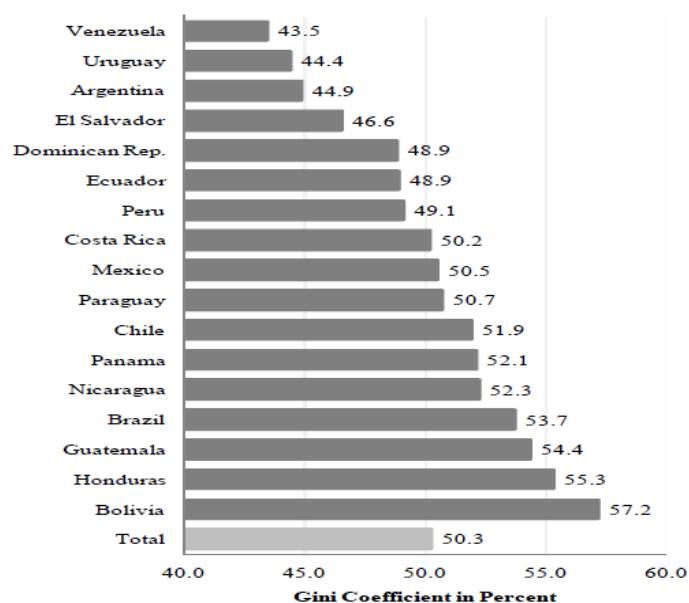
Certainly these growth and social fairness trends in the regions can raise several interesting and important inquiries. One of them relates to the factors influencing economic growth and inequality. In this sense, as we pointed out in Section 2.2, financial development can theoretically be considered as a factor promoting economic growth and diminishing inequality.

Over the last two decades an important body of economic literature has highlighted the role of the domestic financial markets in developing countries. Three topics have been of particular interest. The first one relates to the financial crises experienced in the developing regions in the 1990s. In the case of Latin America, one of the first crisis episodes was the Mexican debacle of 1994-95. Since then, recursive questions related with financial crises have been: why they erupt, how to prevent them, and how to foster financial stability. A second interesting issue is the connection between finance and economic growth. While the long-standing inquiry on the causal relationship between finance and growth still lacks a final answer, most of the current empirical research suggests that finance should be considered as the explanatory variable and thus of interest to policymakers. The third topic refers to the access to finance, and it has been studied less than the other two. Some questions related to it are: who can obtain finance, at what cost, and how access can affect the potential of micro, small, and

within countries. The Dollar and Kraay compilation includes observations for households (in 372 cases), individuals (365), and income receiving units whose definition is unknown in 22 cases. Some observations derive from income (591) and others from expenditure (168). Of the income-based observations, some were reported after taxes (174), some before taxes (370), and forty-seven observations are not identified. These inconsistencies and unknowns compromise comparability and bias any statistical results in an unpredictable manner. Household data hide intra-household inequality, income saved is not included as expenditure, and progressive taxes mean that inequality before taxes is greater than after taxes (Lubker et al., 2002, p. 560).

medium enterprises to contribute to growth and a more equal distribution of income and wealth (Stalling & Studart, 2006).

Figure 2.6. Latin America and the Caribbean: Gini coefficient (2009)



Source: Lustig et al., 2011

The financial systems in Latin America and the Caribbean

Regarding the most important characteristics of the financial sector in Latin America and the Caribbean, Stalling and Studart (2006), Jimenez and Manuelito (2011), and De la Torre, Ize, and Schmukler (2012) have referred to some main features and stylized facts. In the remainder of this section we synthesize some of these characteristics of the financial systems in the region.

A first important characteristic relates to the structure of the financial systems, which is based on financial intermediaries (mainly banks³⁶). So bank credit is more important than other forms of finance such as the issuing of bonds or stocks. However, as we can see in Figure 2.7, bank credit as a share of GDP is low compared to that of developed and other developing countries (i.e. East Asia)³⁷. Also, a low share of total bank credit goes to the private rather than the public sector. Additionally, short maturities are typical in the private sector bank. This is one reason why firms are continuously rolling over credit or looking for other ways to finance long-term capital (investment).

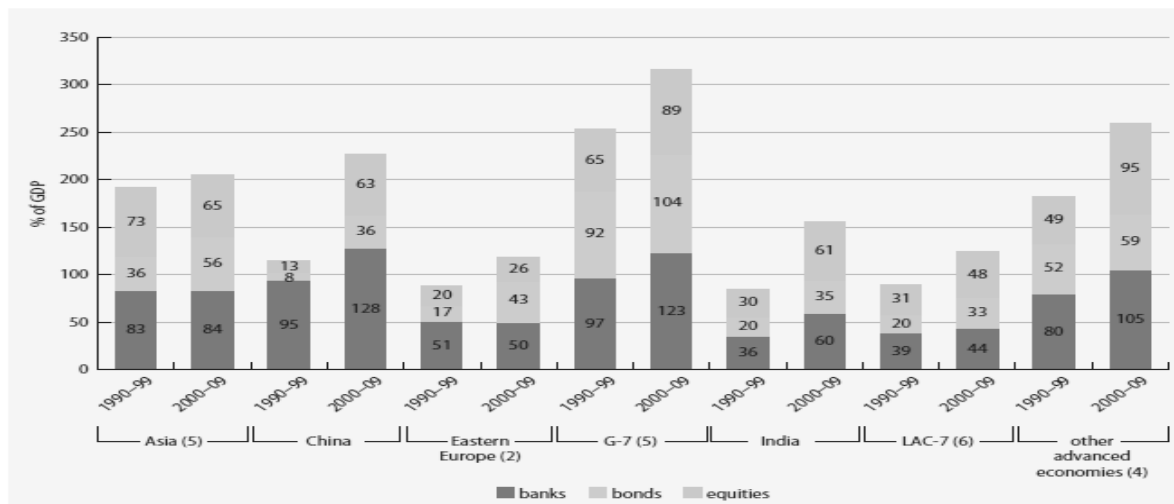
If we follow Figure 2.7, it is impossible to neglect that Latin American financial systems have developed and deepened over the last two decades. And in some countries (such as the ones selected for sample LAC-7³⁸ in Figure 2.7), the bond and equity markets have gained importance in the financial systems. However, despite this general deepening, financial systems in Latin America are behind in relation to other regions. Specifically, Figure 2.7 shows that financial assets relative to GDP in the Latin American region ranked almost last among the countries examined for the last decade (2000-09). In the selected countries, it seems that the underperformance arises from both the very limited bank assets and the small size of the securities market, which are below the levels of other regions (De la Torre, Ize, & Schmukler, 2012).

³⁶ In some Latin American countries such as Bolivia, the banks are the most important financial institutions if we look at the assets or deposits. However, if we look at other measures such as the number of clients, it is evident that non-bank deposit institutions have a significant share (in Bolivia at least 50%) of the total number of clients of deposit financial institutions.

³⁷ To give an idea, in average terms in the region, bank credit represented around 41% of GDP in 2003, while it was 96% in East Asia and 94% in the Group of Seven (G-7) countries.

³⁸ De la Torre et al. (2012) selected a group of seven countries (LAC-7): Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Paraguay.

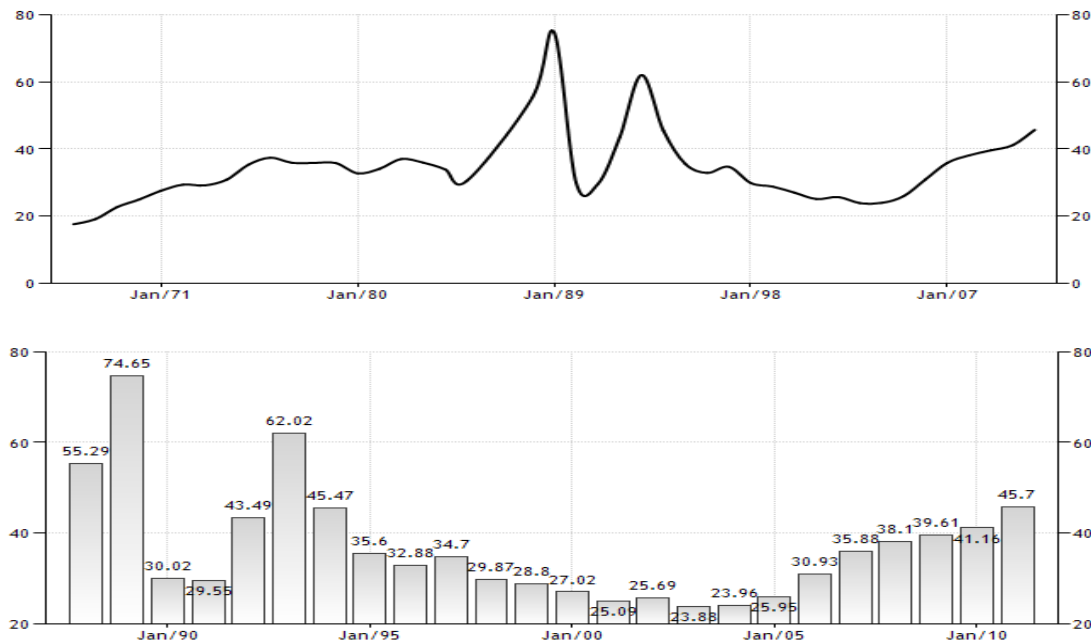
Figure 2.7. Structure of the financial systems by region (% of GDP)



Source: De la Torre et al. (2012)

Another stylized fact shown in Figure 2.8 refers to the high volatility of bank behavior and the frequency of crises in the wake of financial liberalization at the end of the 1980s and the beginning of the 1990s. Additionally, a link has developed between banking and currency crises, giving rise to the emergence of “twin crises.” In fact, World Bank data shows that Latin American countries had the highest average number of financial crises in the last three decades and that they also were the most likely to have recurrent crises.

Figure 2.8. Domestic credit to private sector (% of GDP) in Latin America and the Caribbean (1967-2011)



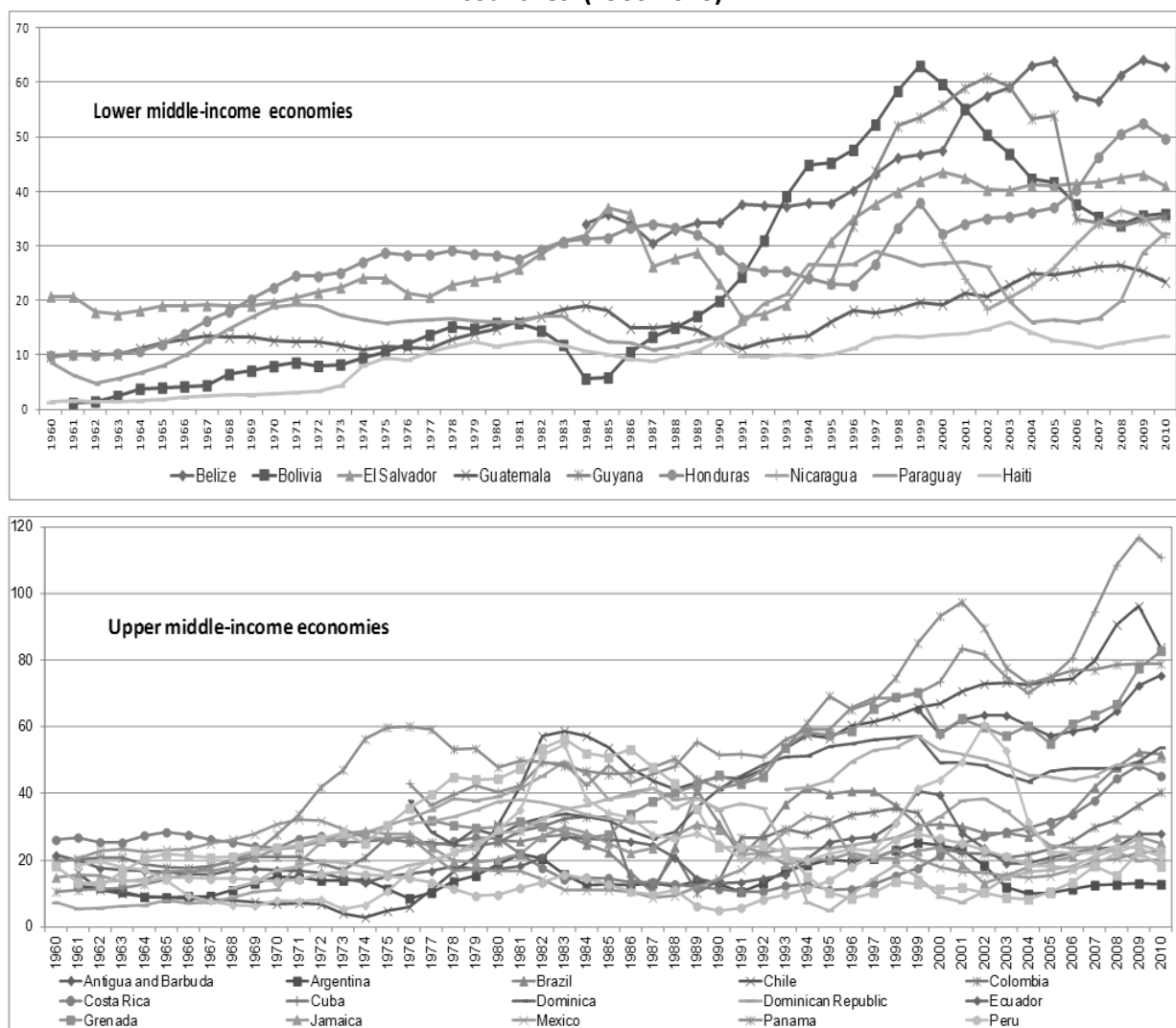
Source: World Bank, 2012

Furthermore, as we can observe in Figure 2.9, there is substantial heterogeneity within the region in terms of the development of their financial systems. In fact, considering the size of the financial intermediation, measured as private credit by deposit money banks and other financial institutions to GDP, it is evident that there are significant differences among countries in the region. However, as a common characteristic this indicator in most Latin American countries in recent years is around 60%,

except for Chile and Panama, where credit to the private sector accounts for close to 100%. Argentina and Haiti also count as exceptional cases of another type since this indicator does not reach even 20% (Jimenez & Manuelito, 2011).

Another important feature of Latin American financial systems relates to bank ownership. In the region, many public banks were privatized, being sold to both local and foreign firms. Data shows that between 1990 and 2002, the share of assets in government-owned banks in the six largest Latin American countries fell from 46 to 32%. Moreover, data also indicates that domestic private ownership fell during this period, due to the increase in foreign ownership of banks in the region.

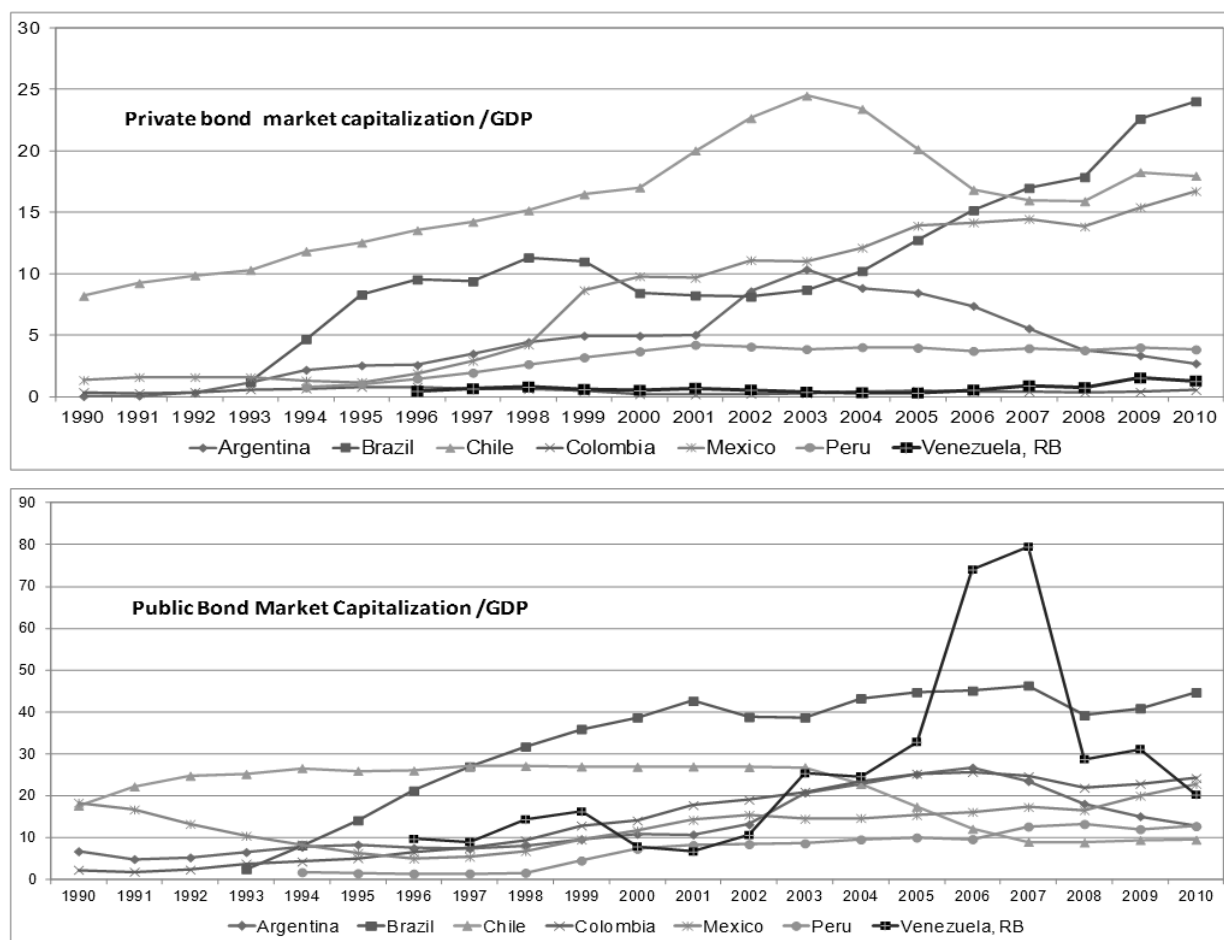
Figure 2.9. Domestic credit to private sector (% GDP) in Latin America and the Caribbean by countries (1960-2010)



Source: Author's own preparation based on dataset by Beck & Demirgüç-Kunt, 2012

Turning again to the structure of the financial systems, it is important to note the small share of the security market. In fact, outstanding bonds (public and private) represented around 35% of GDP in recent years, while stock market capitalization has a similar share (See Figure 2.9 and 2.10). If we look at other regions such as East Asia, these percentages are 60 and 80%, respectively. However, we must not ignore that despite their low share in the financial systems, Latin American capital markets have grown in the last two decades. Additionally, we also have to consider that in some countries such as Bolivia, the security market just started operations at the end of the 1980s. In this sense, some security markets (stock exchanges) are relatively new.

Figure 2.10. Bond market capitalization/GDP in Latin America and the Caribbean (1989-2010)*



*Data only available for the countries in the graph

Source: Author's own preparation based on dataset by Beck and Demirgüç-Kunt, 2012

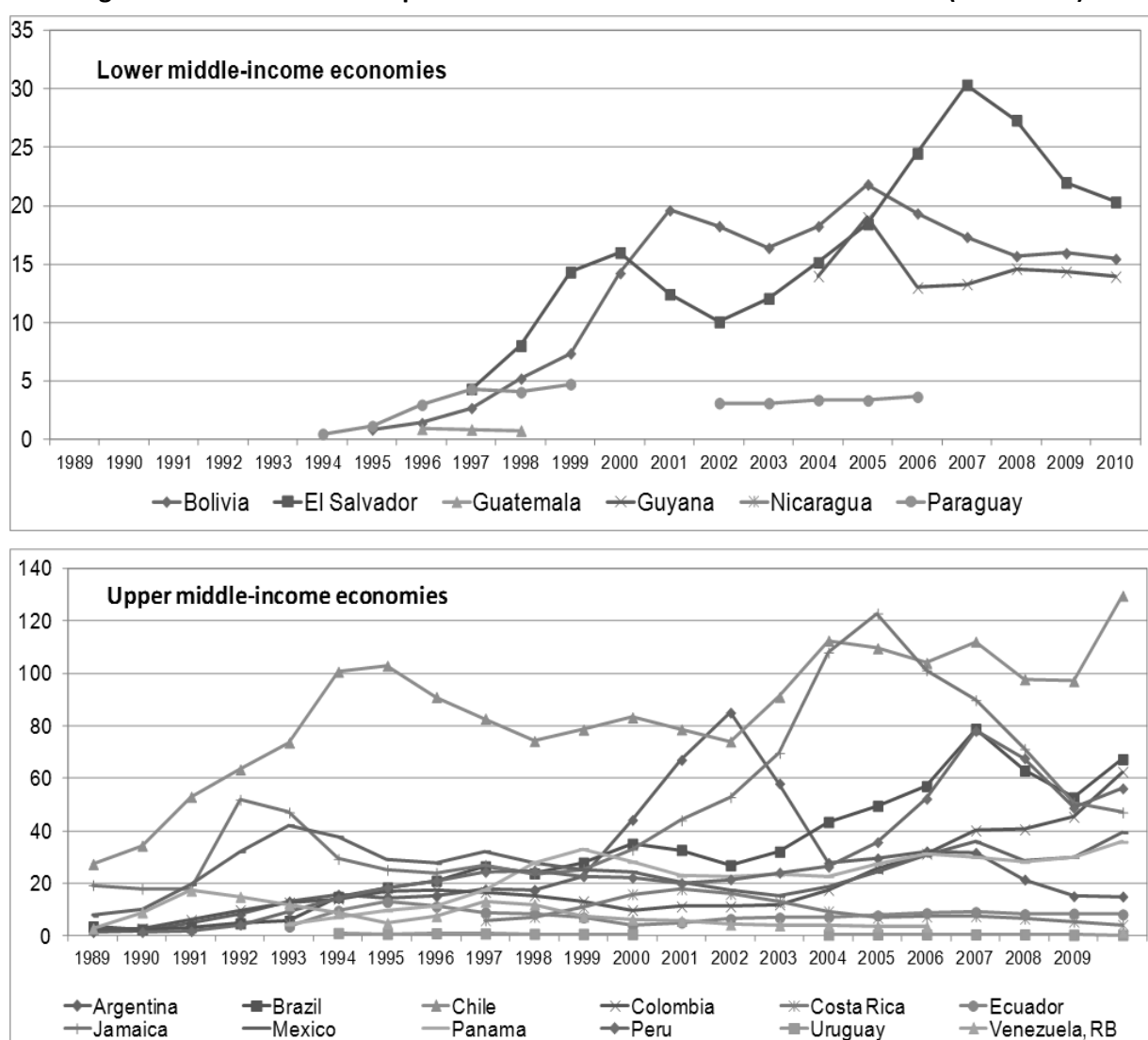
At the global level, bond markets were highly dynamic between 2003 and 2008, particularly in the case of the most developed countries. However, Latin America showed one of the lowest rates of growth in bond issues, compared with other developed and developing regions. It is probable that this low growth rate was related to the reduction of public debt in most of the economies in the region. Nevertheless, as is evident in Figure 2.10, public bonds have a higher proportion than private bonds. In fact, as we can see in countries such as Venezuela, Brazil, Mexico, Peru, and Colombia, public bond market capitalization's share of GDP is larger than the share of the private market.

The weight of public bonds in the security markets should draw our attention, since it serves as a signal that the bond markets in the region are not conducive to finance (private) investment. Therefore, the role of financial intermediations appears to be crucial in the region.

Regarding the stock market, as in most emerging countries, this market has grown in the last two decades. However, when adjusting for changes in equity prices, the apparent expansion observed in Figure 2.11 is much less modest. In this sense, the increase in the market capitalization indicators seems better explained by valuation adjustments than by new issuing. Therefore, contrary to what Figure 2.11 would suggest, there has been a decline in the activity of this market in Latin America and the Caribbean (except for the case of Chile). This situation becomes even worse if we look at stock market turnover, with data showing that there is a general lack of liquidity (except for the case of Brazil, which registered a turnover ratio of around 70%). Furthermore, access to this market has been an exclusivity of a few big firms (De la Torre et al., 2012; Jimenez & Manuelito, 2011).

Another stylized fact relates to access to finance. Such access is quite limited in most Latin American countries. Micro, small, and medium-sized firms have considerable difficulty getting finance from financial intermediaries (i.e. banks). Security markets are usually exclusively for the largest firms, so bank finance becomes the unique formal financing alternative to self-finance for smaller firms. Even though small and medium firms have significant limitations when accessing finance, it is important to note that these difficulties vary by country. For example, in Argentina, Mexico, and Peru, more than 50% of small and medium firms report finance as their main problem, while in other countries such as Colombia, Chile, and Brazil, this problem is reported by only 25-30% of small enterprises. These differences are more significant if we consider the East Asian region where small firms have better and broader access to financial markets than in the case of Latin America (Stallings and Studart, 2006; CAF, 2011; De la Torre, 2012).

Figure 2.11. Stock market capitalization in Latin America and the Caribbean (1990-2010)



Source: Author's own preparation based on dataset by Beck and Demirgüç-Kunt, 2012

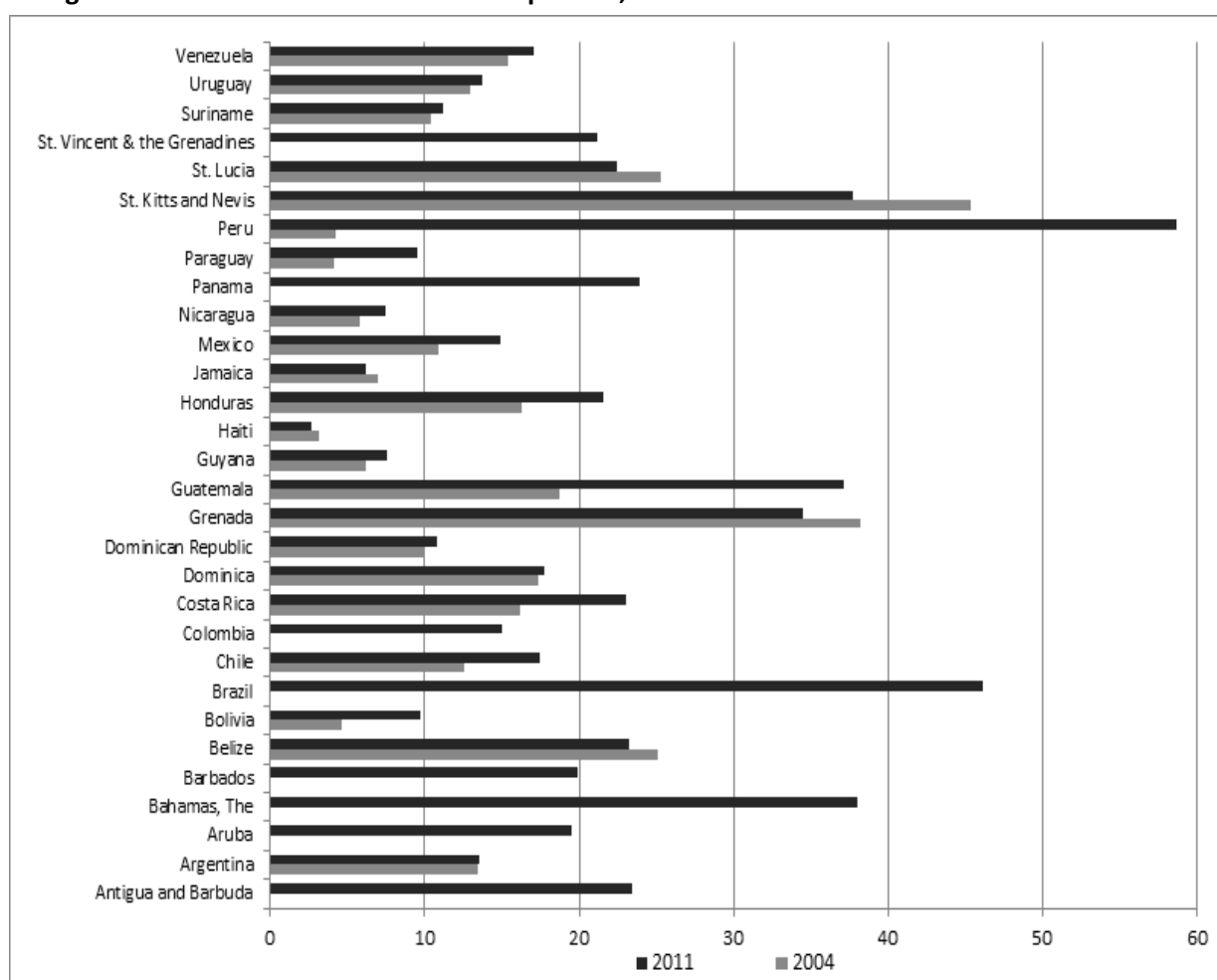
Figure 2.12 and 2.13 refer to some recent cross-country indicators of financial access and use for Latin American and Caribbean countries, respectively. As the data shows, although Latin American financial systems appear to be not well developed and lagging in comparison with other developing regions, it seems that in general most economies in the region have progressed in terms of their financial systems becoming more inclusive. The number of branches and deposits per 100,000 adults suggests that the region is on par with Asia but still lags behind developed countries and Eastern Europe (De la

Torre et al., 2012). However, we should be cautious about the quality of available datasets and indicators, since most of these cross-country data collections (i.e. World Bank, IMF) have significant measurement and information shortages. Therefore, Figure 2.12 and Figure 2.13 would not be the most precise and proper picture to describe the situation of Latin America in terms of access and use of financial services. This issue is discussed in more detail in the next chapter.

Last but not least, as another important aspect of financial systems in Latin America and the Caribbean, it is necessary to consider legal origin. Since many countries of the region were colonized by Spain and Portugal, the French Civil Code is the origin of law present in many Latin American and Caribbean countries. There are also some countries in the region that have as their legal origin the British legal code (mainly in the Caribbean). Consequently, the fact that in most law and finance studies the French legal family performs worst might suggest that the legal origin is an important factor in explaining the low performance of financial systems in the region.

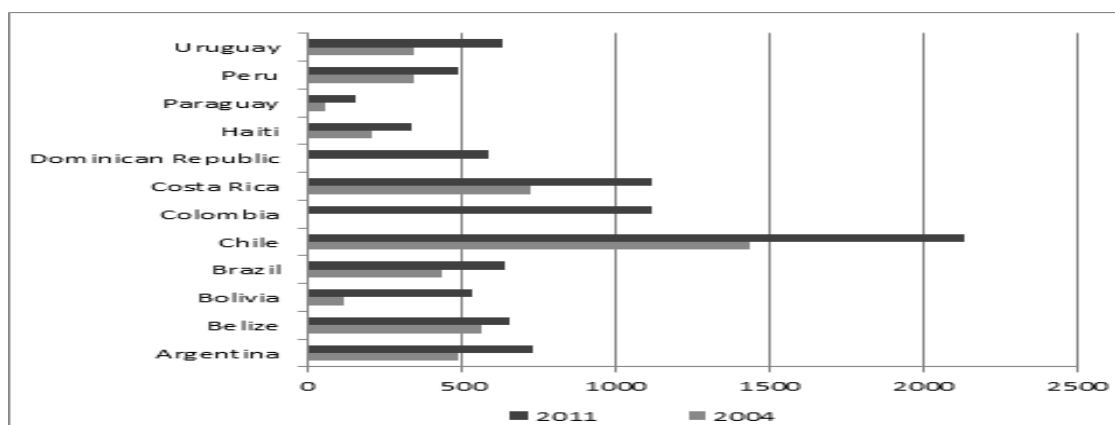
In sum, if we consider on the one hand the characteristics of the financial systems just described and on the other hand their poor performance in terms of economic growth, we could think about financial development as a factor discouraging economic growth in the region. Although a great deal of theory and empirical evidence points to finance as an important growth determinant in all countries, such evidence is scarce or inexistent for Latin America and the Caribbean. Specifically, as we already stated, part of the present paper focuses on this issue. Additionally, if we look at the issue of “socially fair” growth and development, it is also very important to take into account the distributional and poverty impact effects of finance in the region.

Figure 2.12. Commercial bank branches per 100,000 adults in Latin America and the Caribbean



Source: Author's own preparation based on IMF data (2012)

Figure 2.13. Depositors with commercial banks per 1,000 adults in Latin America and the Caribbean



Source: Author's own preparation based on IMF data (2012)

2.5 Methodology and Data

Methodological strategy

The present study has two main research components. First, prior to establishing some important theoretical considerations, we attempted to make a review of recent empirical literature on the finance-growth and finance-inequality relationships. The main goal of such a review has been to find some preliminary answers to our research question. Additionally, another important purpose has been to identify alternative proxies of finance, inequality, economic growth, and other variables that also influence growth and inequality apart from finance (control variables). Furthermore, we have paid special attention to the econometric techniques applied in the recent literature so that we could identify the advantages and disadvantages of different econometric techniques and consider them when deciding on the techniques to be used in our research.

The second component of this study is more empirical, mainly based on cross-country and panel data econometric analysis. The pure cross-sectional analysis might capture the long-term relationships of finance-growth and finance-inequality. In contrast, the panel techniques would be more suitable to examine the *process* of how growth and inequality are explained by finance. So panel analysis might be a reflection of both the long-term and the medium-term tendencies.

One of the main advantages of the panel analysis is to exploit both the cross-country and time series dimensions of the data. In fact, the availability of repeated observations on the same units allows the specification and estimation of more complete and realistic models than a single cross-sectional or a single time series would do (Verbeek, 2000). However, among some disadvantages, most are of a practical nature, such as, for example, the time-consuming effort of constructing the panel datasets, specifically when faced with a considerable number of cross units (in our case countries), variables, and time series. With respect to that, our original dataset contains information about 33 countries of Latin America and the Caribbean for around 40 indicators (see Annex 2.4), with annual observations for the period 1960-2005. This has been reduced to average data over the whole period 1960-2005 (for the cross-country analysis) and average data over non-overlapping 5-year periods (for the panel data analysis) in order to diminish the economic cycle effects.

Data sources

The data on financial development proxies was collected and prepared on the basis of data from the World Development Indicators (WDI) and International Financial Statistics (IFS) prepared by the IMF. Data on measures of income inequality comes from the well-known Deininger and Squire dataset, the

WDI dataset, and the Texas Inequality Project. For the measures of economic growth, the data is based on the Penn World Tables (Version 6.2). Additionally, data on other variables explaining economic growth and inequality and instrumental variables was taken from Barro and Lee's education dataset, the WDI, and other more specific World Bank datasets.

Estimation equations and econometric techniques

The two basic regression equations to be estimated both by cross-country and panel data techniques are summarized in equations (5) and (6). Equation (5) points to the relationship finance-growth and equation 6 shows the finance-income inequality relationship.

$$Y_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 CV_{it} + e_{it} \quad (5)$$

$$I_{it} = \alpha_0 + \alpha_1 FD_{it} + \alpha_2 CV_{it} + e_{it} \quad (6)$$

Growth equation: Explained and explanatory variables

In model (5), the dependent variable (Y_i) is an indicator of economic growth. The explanatory variables are FD and CV. FD is an alternative measure of financial development and CV is a set of variables that in addition to financial development explain economic growth (control variables). The indicator of economic growth is the growth rate of real per capita GDP. The data source of this indicator is the Penn Word Tables (v.6.2). One of the main advantages is that this growth rate is calculated with PPP (purchasing power parity) terms taken into account, allowing for the comparison between different countries.

In the case of financial development, some alternative indicators were collected and/or prepared for both equations (5 and 6). The main purposes for using different alternative measures were to guarantee robust estimations and to consider different arguments from the existing empirical literature on this issue. Additionally, it is very important to note that financial development is a process involving the combination of many functions and institutions, so it is almost impossible to capture it using one single measure.

Two of our finance indicators are commonly used as measures of financial development in most of the empirical literature about financial development. These are domestic credit to the private sector as a percentage of GDP (privateCredit1) and liquid liabilities (M3) as a percentage of GDP (M3/GDP). Both indicators were collected from the Word Development Indicators (WDI) dataset prepared by the World Bank. Additionally, we prepared other indicators of financial development (i.e. privatecredit2, M2/GDP) addressing the stock-flow problem of financial intermediary balance sheet items being measured at the end of the year, whereas nominal GDP is measured over the year. With regard to this, some authors such as King and Levine have tried to solve this problem by averaging the balance sheet items in year t and $t-1$ and dividing it by GDP in year t . However, this does not resolve the distortion introduced by highly inflationary environments. Therefore, Levine et al. (2000) suggest deflating end-of-year financial balance sheet items by end-of-year CPI. So we calculated the average of the real financial balance sheet items in years t and $t-1$ and divided it by real GDP measured in year t (Calderon and Liu, 2002). Indicators that we prepared considering these quotations are the real private credit to real GDP (privateCredit2) and the real broad money (M2) to real GDP (M2/GDP). The calculations of these measures were based on data from the International Financial Statistics (IFS) prepared by the IMF.

Additionally, regarding the selection of financial development indicators, we have to take note that the generally used indicators of financial development such as the ones that we are considering in the present study may have significant limitations. In fact, measures such as total credit to the private sector and money supply reflect more the depth and efficiency of the financial sector, ignoring other important dimensions of finance such as quality of and access to financial services or financial institutional diversification. Despite the fact that economic theory and economists seem to be aware

of the importance of other dimensions of finance besides financial development, the scarcity and lack of data reflecting these aspects of finance serves as a reason to focus more on financial development indicators when evaluating the role of finance on growth and social fairness.

The few attempts to measure other aspects of finance such as access to finance started around 2007 and unfortunately have significant limitations. One of these limitations is that they do not take into account the financial services supplied by non-bank deposit institutions when measuring access to finance. In this sense, it is important to take into consideration that non-bank deposit institutions play a significant role in the financial system of some countries, mainly developing economies. Although some very recent cross-country datasets about access and use of financial services (i.e. IMF, 2012) recognize the important role of non-bank deposit institutions in developing regions such as Latin America, they do not yet have data about this part of the non-bank financial system (in terms of access, use, and diversification indicators). Therefore, data and indicators reflecting other dimensions of financial development are still very limited both in terms of availability and quality.

Regarding the set of control variables in equation (5), we collected and/or prepared measures of: initial human capital, initial income level, government size, population growth, trade, economic stability, foreign direct investment, ethnological fractionalization, and other factors that theoretically would affect growth. The convergence effect predicted by growth models (i.e. Barro, 1997) is captured by the log of initial per capita GDP, and the initial level of human capital is proxied by the initial level of secondary school attainment (secondaryEdu) and by the initial average years of school attainment (schoolYears). Additionally, we have included dummy variables to take into account income differences between countries and structural differences across periods (time dummies). See Annex 1.3 for a complete list of collected and/or prepared indicators.

Inequality equation: Explained and explanatory variables

In equation (6), the explained variable is a measure of income inequality. The explanatory variables consist of an alternative indicator of financial development (FD) and a set of control variables (CV) that also influence inequality apart from financial development. Another specific representation of equation (6) is equation (7), where the quadratic value of the measure of financial development is regarded in order to test the inverted U-shaped hypothesis of inequality. In testing this hypothesis, the panel analysis might be more appropriate.

$$I_{it} = \alpha_0 + \alpha_{11} \text{Finance}_{it} + \alpha_{12} \text{Finance}_{it}^2 + \alpha_2 \text{CV} + e_{it} \quad (7)$$

As already mentioned, the measure of income inequality had three different sources: World Bank, Deininger and Squire, and the Texas Inequality Project. In the case of the first two sources, we obtained data about Gini, while in the case of Texas we obtained data on the Household Income Inequality Index. The main reason we have decided to run our estimations using these different sources relates to the lack of data consistency between the sources. In general, these three different sources describe different tendencies in income inequality in Latin America and other regions.

Deininger and Squire (1996), Dollar and Kraay (2000), UNIDO, and the World Bank Reports are often referred to and used when comparing inequality between countries and regions, but the quality of the data has already been questioned by some authors (i.e. Milanovic, 2002; Lubker et al., 2002). Specifically, Lubker, Smith, and Weeks (2002) note that even though all of the data from these sources measure inequality, the definitions vary among and within countries. So these inconsistencies would compromise comparability and bias any statistical results. Additionally, something that caught our attention is that most of the empirical literature touching on the finance-inequality relationship is based on these observed sources.

An alternative source for measures of income inequality is the Texas Inequality Project, also known as UTIP. Specifically, noting the weakness of other datasets, Texas employs homogeneous definitions and

calculations of inequality indicators. Therefore, it would enable the comparison between countries and regions.

In addition to the financial sector variables, in equation (6) we include several variables to control for other factors that might affect inequality. Specifically, we include a linear term of the log of (initial) real per capita GDP to control for a direct “Kuznets effect” of economic development on income inequality that is independent of financial intermediary development. Once controlling for initial GDP, our estimated coefficient for the finance indicator would capture the effects of finance on steady-state inequality. However, because per capita GDP is highly correlated with financial development, we also estimate the model without this variable. Therefore, we avoid multicollinearity bias in our estimations.

Furthermore, we include the inflation rate, considering that inflation hurts the poor and the middle class relatively more than the rich because the latter have better access to financial instruments that allow them to hedge their exposure to inflation. Other measures refer to human capital, government consumption, and ethnolinguistic fractionalization. We might expect income inequality to be higher in countries where ethnic fractionalization is greater and investment in education is less. In the case of government consumption, its effect on inequality is very ambiguous. In fact, if most redistribution through the tax and transfer system is toward low-income groups, government consumption might result in greater equality. However, it could also have the opposite effect if rich households use their political power to exploit the poor (Clarke et al., 2006).

Other control variables considered in the inequality equation are the size of the modern sector, the degree of economic openness, and a dummy to reflect general income differences between countries. Regarding the measure of the size of the modern sector, as we mentioned in point 2.2, Kuznets (1955) suggested that income inequality might depend on the sectoral structure of an economy. Therefore, in order to capture this proposition we considered a measure representing the share of added value accounted for by industry and services, as opposed to the traditional sector (agriculture).

Possible econometric problems and biases

In the growth and inequality equations, there is the possibility of endogeneity due to reverse causation, omitted variables, measurement error, and selection bias³⁹. Referring to reverse causation, it is likely that growth or inequality influences financial development. This potential bias is prevented using two methods: the lagged (initial) value of the financial development variable and the instrumental variable approach.

To lag the explanatory variable might not be one of the most sophisticated econometric approaches to solve reverse causation, but it is perhaps the most pragmatic way to reduce bias caused by reverse causation. As Beck (2008) pointed, the main shortcoming of using initial values of the explanatory variable is that despite the fact that it might help control for reverse causation, it does not correct for endogeneity originating from omitted variables, measurement error, or the inclusion of the lagged dependent variable. Therefore, the instrumental variable approach appears as another alternative to solve this problem.

The instrumental variable approach aims to isolate that part of the variation in the endogenous variable that is not associated with reverse causation or with omitted variables and measurement error. *“The challenge in the IV procedure is to identify the economic mechanisms through which the instrumental variables influence the endogenous variable – financial development – while at the same time assuring that the instruments are not correlated with growth directly”* (Beck, 2008, p. 11). Both the relevance and exogeneity conditions can be econometrically tested. The F-test, the t-test (on the coefficient of the instrumental variable), and the partial square R in the first stage regression are

³⁹ Beck (2008) provides a comprehensive discussion of the endogeneity issue in finance and growth studies.

typical ways to verify for the relevance condition, while the Sargan test of overidentifying restrictions is the most used at the moment to check the exogeneity or orthogonality condition. However, we should be aware that this test is relatively weak since it has the propensity to reject the null hypothesis of valid instruments too often in small samples.

In our cross-section estimations the selection of the instrumental variable is strongly influenced by the “Law and Finance” theoretical and empirical literature. The law and finance theory emphasizes the role of legal institutions in explaining international differences in financial development. In economies where legal systems enforce private property rights, support private contractual arrangements, and protect the legal right of investors, savers are more willing to finance firms. Consequently, this scenario is propitious for financial development. Another part of the theory of law and finance focuses on the different and various legal traditions that emerged in Europe over previous centuries and were spread internationally through conquest, colonization, and imitation. The central idea is that this legal origin would explain cross-country differences in investor protection, contracting environment, and financial development (Beck & Levine, 2004a).

Additionally, the origin of the country’s legal system is very often used in the pure cross country empirical literature as an instrumental variable and, moreover, is available for all countries. Following the studies by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998), which identify variations in countries’ legal origin as a historical exogenous factor explaining current differences between financial development levels, several empirical studies have utilized this variable in order to extract the exogenous component of financial development (Beck, 2008).

The use of fixed effect regressions would be another way to fix endogeneity by removing any time-invariant omitted variable bias and time-invariant measurement bias. However, in the case of the growth equation (5), the correlation between the transformed lagged dependent variable and the transformed error term will make the fixed effect estimator biased. Additionally, fixed effect models also have a conceptual weakness since they limit the analysis to within-country variation leaving out cross-country variation.

While trying to remove the biases related to the inclusion of the lagged dependent variable and omitted variable bias, while at the same time controlling for reverse causation and measurement error, dynamic panel techniques (i.e. GMM) appear as an alternative solution. However, we should take into account that these dynamic approaches are not advisable when the number of cross-sectional units is low (which is our case when we compare our study with worldwide pooled studies).

Apart from endogeneity (which seems to be the main econometric hurdle), we should also consider the possibility of multicollinearity and heteroskedasticity in our estimations. Although the introduction of control variables could help us partially avoid the omitted variable problem, it could also give rise to multicollinearity. It is likely that in both growth and inequality equations, some control variables such as human capital and fertility rate are high correlated or that our finance proxy is highly associated with some control variables (such as human capital). Therefore, not all variables should be considered at once when estimating the regressions. Finally, considering that heteroskedasticity is a typical problem in cross-sectional estimations, we should also pay attention to it.

2.6 Results and Discussion

As stated above, both pure cross-sectional and panel data analysis were applied in order to estimate equations (5) and (6). Various different models were estimated using alternative indicators of financial development and different sets of control variables. As mentioned in the previous section, the presence of multicollinearity was likely due to the existence of medium and high associations between some explanatory variables. Therefore, it was almost impossible to incorporate at once all the rest of the factors besides finance that influence growth and inequality. For this reason, some indicators of

these variables that were collected and/or prepared were not even considered in the econometric estimations. In Annexes 2.9 and 2.10 two correlation matrices are presented. The first one regards the cross-sectional dataset and the second refers to the panel dataset. Both correlation matrices indicate that not only are there some control variables that show association between each other, but also some control variables are correlated with the finance proxies. The descriptive statistics of both cross and panel datasets are available in Annexes 2.4, 2.5 and 2.6. The main estimations are summarized in tables, where the value and sign of the estimated coefficients are presented. The probability of the t-statistic is also reported (between brackets) for every estimated coefficient below their values.

In considering the cross-country analysis, the averages were calculated for the period 1970-2005 instead of 1960-2005. The purpose was to minimize the effect in the averaging of missing values and non-existing data for the decade of the 60s in the case of some Latin American countries. For the same reason, in the case of the panel data analysis the non-overlapping 5-year period averages were computed since 1970.

2.6.1 Financial development and economic growth

Cross-sectional estimations

As Table 2.1 shows, in the estimated growth equations the growth rate of real GDP per capita was regarded as a dependent variable. The initial level of real GDP was always taken as part of the explanatory variables in order to capture the initial conditions and the convergence issue of economic growth. The effect of financial development was evaluated by three alternative indicators (privateCredit1, privateCredit2 and M2/GDP), and we also included in all estimations a set of alternative control variables. The number of control variables included in the estimated models was limited in order to prevent multicollinearity and also because of the number of available observations (maximum 31), since the inclusion of several explanatory variables would mean an important loss in degrees of freedom.

In most of the estimated models, the different indicators of financial development (privateCredit1, privateCredit2, and M2/GDP) came out robust, positive, and significant at levels of 5 and 10%. Additionally, the Breusch-Pagan test of heteroskedasticity and the VIF analysis for multicollinearity showed that all our selected estimated equations were efficient. In the case of outliers, we followed the graphical test and we did not find that outliers were important. Furthermore, the high values of R square⁴⁰ and the statistic F reflect that our estimate equations are a good fit and that they are valid.

Additionally, in order to prevent the possibility of endogeneity, the models were re-estimated using the instrumental variable approach. Our main adjusted estimations are summarized in Table 2.2, where we can observe that in all of the 2SLS (two stage least squares) adjusted equations, the indicators of financial development kept their positive sign. Additionally, the coefficients of our three different measures of financial depth (privateCredit1, privateCredit2, and M2/GDP) were significant at different levels.

Based on the theory of Law and Finance and the empirical cross-country literature on the finance and growth nexus, legal origin was chosen as the instrumental variable. Additionally, in order to evaluate the validity of the instrumental variable we also ran the first stage regressions and evaluated the significance of the t-statistic in the estimated coefficient of the instrumental variable (dleg) and the significance of F in the whole regression. Based on this test of relevance only in most of our estimated models the legal origin appears to be a valid instrument (See Table 2.2). We did not regard the possibility of alternative instrumental variables, since in other options (i.e. latitude, ethnic

⁴⁰ However, it is important to mention that there is no absolute benchmark to say that an R square is high or low. Even if the value of R square is low, it does not automatically imply that the estimated model is incorrect or useless. It just indicates the relative (un)importance of the explanatory variables being considered in explaining the dependent variable (Verbeek, 2000).

fractionalization) we did not find clear mechanisms through which these variables influence financial development, and they were not correlated with economic growth.

Table 2.1. Finance and growth: Cross-sectional estimations

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10	Regr. 11	Regr. 12	Regr. 13
Constant	1.98 (.49)	3.45 (.22)	1.67 (.57)	6.76 (.16)	5.02 (.24)	4.49 (.11)	3.11 (.20)	4.72* (.04)	0.87 (.66)	-3.41 (.17)	1.63 (.49)	4.31 (.15)	2.04 (.60)
Ln(privatecredit1)	1.78** (.00)			0.8 (.18)	0.66 (.35)					1.59** (.00)			1.54* (0.03)
Ln(privateCredit2)		1.02** (.00)				0.64+ (.08)	0.91** (.00)	0.744** (.00)	0.62** (.00)		0.87** (.00)	0.78** (.00)	
Ln(M2/GDP)			1.12** (.00)										
Initial conditions													
Ln(Initial GDP)	-0.93* (.02)	-0.74+ (.06)	-0.58 (.13)	-1.38+ (.05)	-1.31+ (.07)	-0.81* (.03)	-0.60+ (.07)	-0.73* (.01)	-0.38 (.10)	-0.26 (.37)	-0.47 (.10)	-0.68+ (.07)	-0.93 (.10)
Ln(schoolYears)				1.32+ (.07)									
Ln(secondaryEdu)					1.05 (.12)								1.02 (.10)
Other control variables													
Exports/GDP						0.019 (.14)							
Inflation							-0.003** (.00)	-0.002** (.00)	-0.002** (.00)	-0.003** (.00)	-0.003** (.00)	-0.002* (.01)	
GrowthPop								-0.57** (.00)	-0.087 (.66)	0.079 (.68)	-0.35+ (.05)	-0.58** (.00)	
GrowthExport								0.15** (.01)	0.21** (.00)	0.24** (.00)	0.21** (.00)	0.15* (.01)	
FDI/GDP									0.19* (.03)				
Ethno										0.011+ (.05)			
Debt/GDP											0.005 (.21)		
Dummy Income												-0.10 (.83)	
Ln(GovExpenditure)													-0.21* (.01)
Inflation2													-0.002 (.14)
R squared	.39	.38	.37	.32	.25	.42	.55	.73	.83	.85	.82	.73	.50
Adj. R squar.	.34	.33	.32	.21	.13	.36	.50	.67	.79	.78	.76	.66	.34
F	8.86	8.40	8.30	3.04	2.13	6.60	11.13	12.77	17.65	13.67	15.44	10.23	3.21
Prob > F	.00	.00	.00	.05	.12	.00	.00	.00	.00	.00	.00	.00	.03
Number obs.	31	31	31	23	23	31	31	30	28	22	28	30	22

Note: The dependent variable is the growth rate of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita (1970)

Ln(schoolYears) = Natural logarithm of the initial average years of school attainment (1970)

Ln(secondaryEdu) = Natural logarithm of the initial mean years of secondary schooling (1970)

Exports/GDP = Exports of goods and services (% of GDP)

Inflation = Inflation, consumer prices (annual %)

GrowthPop = Population growth (annual %)

GrowthExport = Exports of goods and services (annual % growth)

FDI/GDP = Foreign direct investment, net inflows (% of GDP)

Ethno = Ethnological fractionalization

Debt/GDP = Total debt service (% of GNI)

Dummy Income = Dummy for upper middle income countries

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

Inflation2 = Change in index GDP deflator 1995

Source: Author's own preparation based on original estimations

Table 2.2. Finance and growth: Adjusted (instrumental variable) cross-sectional estimations

Variable	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)	2SLS (5)	2SLS (6)
Constant	0.59 (.85)	1.26 (.73)	-1.04 (.78)	6.91+ (.08)	0.62 (.83)	-1.78 (.65)
Ln(privatecredit1)	2.40** (.00)			1.92* (.02)		
Ln(privateCredit2)		1.91* (.01)			1.52* (.03)	
Ln (M2/GDP)			1.84** (.00)			1.47* (.02)
Initial conditions						
Ln(Initial GDP)	-1.04* (.01)	-0.87+ (.07)	-0.56 (.15)	-0.83* (.03)	-0.65+ (.08)	-0.39 (.25)
Other control variables						
Inflation				-0.002** (.00)	-0.002* (.01)	-0.002* (.01)
GrowthExports				0.12+ (.06)	0.15* (0.04)	0.19+ (.06)
R squared	.35	.13	.25	.59	.53	.59
Adj. R squared	.30	.07	.19	.53	.45	.52
F	5.87	4.41	5.07	6.68	5.76	5.55
Prob. > F	.00	.02	.01	.00	.00	.00
Number observations	31	31	31	30	30	30
First stage regressions						
Instrumental variable						
dleg	0.51** (.00)	0.64* (.01)	0.67* (.00)	0.47** (.00)	0.60* (.04)	0.62* (.03)
F	8.91	3.50	4.83	3.65	1.47	5.55
Prob.>F	(.00)	(.04)	(0.01)	(0.01)	(.24)	(.00)

Note: The dependent variable is the growth rate of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)
 Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP
 Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP
 Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita (1970)
 Inflation = Inflation, consumer prices (annual %)
 GrowthPop = Population growth (annual %)
 GrowthExport = Exports of goods and services (annual % growth)
 dleg = Legal origin

Source: Author's own preparation based on original estimations

In general and in the same line of well-known international pure cross econometric works such as King and Levine (1993), Levine and Zervos (1998), Rajan and Zingales (1998), Levine (2000), and Beck (2009), most of our pure cross-sectional estimations suggest that financial development is a promoter of economic growth in the Latin American and Caribbean countries (See Table 2.1 and 2.2).

Panel data estimations: Fixed effects

Regarding the data panel analysis, two different panel models were applied: those of fixed and random effects. Running fixed effects models and looking at different indicators of finance and control variable sets, we found positive coefficients for the finance indicators. However, none of them was significant, even at a level of 10% (see Table 2.3). Therefore, given the possibility of endogeneity caused by reverse causation existing between finance and growth, we considered re-estimating the growth equations replacing the finance indicator with its one period lagged value. The instrumental variable approach could not be applied since our instrumental variable (legal origin) was a dummy that did not change over time. It is known that fixed effects (FE) models do not admit variables that do not vary over time, such as the case of our instrumental variable, which is a dummy (legal origin). However, after replacing the finance variable by its one period lagged value, in the re-estimated

regressions the coefficients for financial development did not become significant, despite the fact that their sign remained positive (see Table 2.4).

Table 2.3. Finance and growth: Panel data estimations with fixed effects

Variable	Regr.1	Regr.2	Regr.3	Regr.4	Regr.5	Regr.6	Regr.7	Regr.8	Regr.9	Regr.10	Regr.11	Regr.12
Constant	12.11** (0.00)	10.39** (0.00)	9.86** (0.00)	25.79** (0.00)	24.99** (0.00)	6.58** (0.00)	8.84** (0.00)	13.95** (0.00)	18.13** (0.00)	20.08** (0.00)	20.03** (0.00)	18.74** (0.00)
Ln(privatecredit1)	0.85 (0.11)	0.04 (0.99)		-0.41 (0.54)		0.59 (0.22)	0.58 (0.27)	0.008 (0.98)	0.72 (0.22)			
Ln(privateCredit2)			-0.33 (0.46)		-0.40 (0.41)					-0.044 (0.92)		
Ln(M2/GDP)											-0.27 (0.62)	
Ln(M3/GDP)												0.69 (0.41)
Initial conditions												
Ln(Initial GDP)	-0.85 (0.13)	-0.95** (0.00)	-0.80** (0.01)	-1.55** (0.00)	-1.55** (0.00)	-0.58** (0.00)	-0.98* (0.10)	-0.99** (0.00)	-1.83** (0.00)	-1.66** (0.00)	-1.60** (0.00)	-2.55** (0.00)
Ln(schoolYears)	-0.33 (0.81)					-1.26 (0.37)						
Ln(secondaryEdu)							0.08 (0.92)					
Other control variables												
Ln(govExpenditure)	-2.32** (0.02)	-0.19**1 (0.00)	-0.19**1 (0.00)	-3.91** (0.00)	-3.67** (0.00)	-0.15* (0.01)	-1.24 (0.12)	-2.41** (0.03)	-2.41** (0.00)	-2.65** (0.00)	-2.54** (0.00)	-2.55** (0.00)
DummyDecade80	-1.95** (0.00)	-1.32** (0.00)	-1.21** (0.00)	-1.26** (0.00)	-1.19** (0.00)	-1.78** (0.00)	-1.95** (0.00)	-1.37** (0.00)	-1.13** (0.00)	-0.99** (0.02)	-0.98** (0.02)	-1.13** (0.00)
TradeOpenness		0.02** (0.04)	0.035** (0.03)			0.031* (0.06)	0.03* (0.10)	0.03** (0.02)	0.04** (0.01)	0.04** (0.02)	0.04** (0.02)	0.04** (0.02)
Inflation2				-0.001** (0.02)	-0.001** (0.02)							
Inflation						-0.0005 (0.23)	-0.0008* (0.09)					
Debt/GDP				0.045 (0.36)	0.039 (0.44)				-0.15** (0.02)	-0.16** (0.02)	-0.16** (0.02)	-0.14** (0.04)
FDI/GDP									0.17** (0.03)	0.17** (0.04)	0.17** (0.03)	0.17** (0.03)
Within R-sq	0.31	0.21	0.17	0.28	0.25	0.31	0.34	0.21	0.33	0.32	0.32	0.33
Between R-sq	0.62	0.06	0.01	0.03	0.00	0.00	0.24	0.00	0.23	0.21	0.18	0.19
Overall R-sq	0.12	0.09	0.07	0.03	0.02	0.16	0.27	0.11	0.24	0.23	0.22	0.22
F	13.14	10.82	6.93	8.60	6.73	9.53	9.29	10.51	10.56	8.59	8.71	10.39
Prob> F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of observations	174	237	202	169	159	186	157	237	182	162	163	182

Note: The dependent variable is the growth rate of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Regression 6 uses the estimated coefficient for the level of govExpenditure instead of its natural logarithm.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(M3/GDP) = Natural logarithm of liquid liabilities (M3) as % of GDP

Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita at the beginning of every 5-year period

Ln(schoolYears) = Natural logarithm of the initial average years of school attainment (1970) at the beginning of every 5-year period

Ln(secondaryEdu) = Natural logarithm of the initial mean years of secondary schooling (1970) at the beginning of every 5-year period

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

DummyDecade80 = Time dummy for the 80s

TradeOpenness = Sum of exports and imports as a share of GDP

Inflation2 = Change in index GDP deflator 1995

Inflation = Inflation, consumer prices (annual %)

Debt/GDP = Total debt service (% of GNI)

FDI/GDP = Foreign direct investment, net inflows (% of GDP)

Source: Author's own preparation based on original estimations

Table 2.4. Finance and growth: Adjusted panel data estimations with fixed effects

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10	Regr. 11	Regr. 12
Constant	11.57** (.00)	11.76** (.00)	12.04** (.00)	24.99** (.00)	23.35** (.00)	9.00** (.00)	8.47** (.00)	15.10** (.00)	18.58** (.00)	18.80** (.00)	18.72** (.00)	18.98** (.00)
Ln(privatecredit1)	0.45 (.31)	-0.56 (.23)		0.017 (.98)		0.48 (.27)	0.48 (.30)	-0.56 (.23)	0.72 (.16)			
Ln(privateCredit2)			-0.51 (.22)		0.13 (.73)					0.27 (.46)		
Ln(M2/GDP)											0.27 (.53)	
Ln(M3/GDP)												0.80 (.26)
Initial conditions												
Ln(Initial GDP)	-0.54 (.29)	-0.90** (.00)	-1.02** (.00)	-1.48** (.00)	-1.44** (.00)	-0.51 (.36)	-0.85 (.16)	-0.93** (.00)	-1.89** (.00)	-1.78** (.00)	-1.78** (.00)	-1.94** (.00)
Ln(schoolYears)	-0.76 (.59)					-1.32 (.34)						
Ln(secondaryEdu)							0.01 (.98)					
Other control variables												
Ln(govExpenditure)	-2.34** (.00)	-0.17** (.00)	-0.15** (.07)	-3.83** (.00)	-3.41** (.00)	-1.75* (.01)	-1.17 (.14)	-2.23** (.00)	-2.42** (.00)	-2.24* (.03)	-2.23** (.00)	-2.50** (.00)
DummyDecade80	-2.03** (.00)	-1.41** (.00)	-1.67** (.00)	-1.16** (.00)	-1.22** (.00)	-1.80** (.00)	-1.96** (.00)	-1.46** (.00)	-1.17** (.00)	-1.18* (.01)	-1.19** (.00)	-1.16** (.00)
TradeOpenness		0.026+ (.05)	0.03+ (.07)			0.03+ (.09)	0.03 (.14)	0.03* (.02)	0.04* (.01)	0.04* (.01)	0.04* (.01)	0.04* (.01)
Inflation2				-0.001* (.02)	-0.001* (.04)							
Inflation						-0.0008+ (.09)	0.0009+ (.09)					
Debt/GDP				-0.10 (.15)	-0.11 (.11)				-0.15* (.02)	-0.15* (.04)	-0.15* (.08)	-0.15* (.04)
FDI/GDP									0.15+ (.05)	0.14+ (.09)	0.15+ (.08)	0.16* (.04)
Within R-sq	.29	.23	.19	.31	.28	.28	.33	.23	.33	.33	.33	.33
Between R-sq	.56	.15	.03	.32	.31	.00	.20	.05	.21	.29	.29	.19
Overall R-sq	.09	.08	.08	.00	.00	.15	.25	.10	.23	.26	.25	.22
F	13.09	11.76	6.56	10.03	7.87	8.71	8.80	11.54	10.71	8.19	8.35	10.55
Prob. > F	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Number of observations	191	232	177	167	151	185	156	232	181	152	153	181

Note: The dependent variable is the growth rate of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

In regressions 2 and 3 instead of the natural logarithm of the government expenditure indicator we used its original value.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP) lagged one period

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP lagged one period

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP lagged one period

Ln(M3/GDP) = Natural logarithm of liquid liabilities (M3) as % of GDP lagged one period

Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita at the beginning of every 5-year period

Ln(schoolYears) = Natural logarithm of the initial average years of school attainment at the beginning of every 5-year period

Ln(secondaryEdu) = Natural logarithm of the initial mean years of secondary schooling at the beginning of every 5-year period

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

DummyDecade80 = Time dummy for the 80s

TradeOpenness = Sum of exports and imports as a share of GDP

Inflation2 = Change in index GDP deflator 1995

Inflation = Inflation, consumer prices (annual %)

Debt/GDP = Total debt service (% of GNI)

FDI/GDP = Foreign direct investment, net inflows (% of GDP)

Source: Author's own preparation based on original estimations

Since fixed effect regressions are inherently a way to prevent endogeneity, we persisted in trying other possible adjustments to achieve efficiency (significance) in the estimations. Among these possibilities, we introduced interactive variables of finance combining the country dummies with the indicators of finance, but without the expected results. Additionally, since there was a high chance for autocorrelation because of the presence of the initial real per capita GDP as an explanatory variable, we also considered the possibility of running an autoregressive (AR 1) fixed model effect. However, in

practice we realized that you cannot apply an AR when you have an unbalanced panel dataset (missing or non-existing data for some periods and countries).

Finally, we also considered that fixed effect techniques would not be the best way to approach the growth equation. Given the presence of the lagged dependent variable as part of the explanatory variables, we should be aware that correlation between the error term and the lagged dependent variable is introduced. Therefore, it is very likely that FE estimations would be biased.

Panel data estimations: Random effects

Considering the lack of significance and the high possibility of bias in the fixed effect estimations, we decided to re-estimate our growth equations following the random effects (RE) model. Given the recognition that an important shortcoming of our FE estimations is that the initial level of real GDP per capita is essentially a lag of the dependent variable, and that consequently FE would not be consistent, the RE model appeared to be a good alternative. Additionally, in terms of concept, RE models seem a more appropriate way to approach a regional level study. In fact, RE estimations allow making inferences with respect to population characteristics (in this case the Latin American and Caribbean region) and not to individuals. Additionally, RE effects control for omitted variables that differ between cases (FE) but are constant over time, and also for constant variables between cases that vary over time (Verbeek, 2000). We think that is the case for the Latin American and Caribbean countries. There are certain fixed characteristics for every country, but at the same time there are common characteristics in the region that could vary over time.

Therefore, by running random effects models using different indicators of finance and control variable sets, in most of the estimated models we found positive and significant coefficients for the indicators of finance. As shown in Table 2.5, the coefficients for the three measures of finance (privatecredit1, privateCredit2, and M2/GDP) have positive signs and are significant at 5 and 10% (with the exception of regression 3).

In all the estimated regressions, the initial value of the real GDP is negative and significant, giving support to the growth convergence hypothesis. In the case of the initial value of human capital (schoolingYears), despite the fact that their coefficients were all positive, in some equations they were not significant (see Table 2.5). However, we do not regard this fact as evidence that human capital is not an important factor leading to growth in Latin America and the Caribbean. On the contrary, based on theory and empirical literature (i.e. Barro, 1997), we strongly believe that human capital is a key factor influencing growth. In any case, a possible main reason why the coefficient of the measure of human capital is not significant in some estimated regressions could be related with the measure itself. One of the available measures of human capital was the average years of school attainment, while in the case of education the most proper indicator would be the median and not the average. Additionally, there are some medium level correlations between our human capital indicators, finance indicators, and other control variables (i.e. fertility rate), and in that case multicollinearity could distort the sign and significance of estimated coefficients.

Additionally, in order to not ignore the possible reverse causation in the finance-growth relationship and to at least partially overcome the endogeneity problem, we re-estimated the equations, considering the initial value of the financial development indicators. These re-estimated regressions are summarized in Table 2.6. As we can see, in the most of these re-estimated equations the coefficients for the three alternative financial development indicators retained their positive sign and significance at the 5 and 10% level. However, since endogeneity has not been fully controlled, we should consider the possibility that these estimations are biased.

We also considered the instrumental variable approach as a measure to solve endogeneity. However, we did not find it practical to use our available time invariant variable (legal origin) to substitute for a time variant endogenous variable. Therefore, instrumental variable regressions were not estimated.

Additionally, econometric panel procedures refer to the Hausman test in order to determine the best model between fixed effects and random effects. Therefore, we also ran the Hausman test, comparing the models estimated by fixed effects and random effects. According to this test, the fixed effects models seemed to be superior to random effects models. But then, as we already noticed, the fixed effects model might have significant weaknesses in our analysis. These shortcomings are mainly related with the presence of the lagged dependent variable as an explanatory variable and the fact that, conceptually, FE models limit the analysis to within-country variation, leaving out cross-country variation. Therefore, despite the results of the Hausman test, we believe we have strong arguments to regard the RE estimations as proper and valid for the present analysis.⁴²

Table 2.5. Finance and growth: Panel data estimations with random effects

	Regr.1	Regr.2	Regr.3	Regr.4	Regr.5	Regr.6	Regr.7	Regr.8	Regr.9	Regr.10
Constant	13.64** (.00)	13.81** (.00)	12.62** (.00)	13.64** (.00)	17.37** (.00)	15.71** (.00)	17.89** (.00)	15.44** (.00)	14.03** (.00)	13.05** (.00)
Ln(privatecredit1)	1.50** (.00)			1.51** (.00)	1.53** (.00)	1.20** (.00)		1.05* (.02)		0.95* (.02)
Ln(privateCredit2)		0.56+ (.09)					0.59+ (.06)		0.65* (.03)	
Ln(M2/GDP)			0.52 (.18)							
Initial conditions										
Ln(Initial GDP)	-1.93** (.00)	-1.60** (.00)	-1.30** (.00)	-1.93** (.00)	-2.10* (.01)	-1.88** (.00)	-1.74** (.00)	-1.80** (.00)	-1.53** (.00)	-1.81** (.00)
Ln(schoolYears)	1.64* (.03)	1.24 (.21)	1.19 (.21)	1.64 (.03)	1.32 (.09)	1.35+ (.08)	0.76 (.42)	1.23 (.11)	0.73 (.43)	1.07 (.13)
Other control variables										
Ln(GovExpenditure)	-1.33* (.03)	-0.76 (.26)	-0.61 (.35)	-1.33* (.03)	-1.66** (.00)	-1.24+ (.05)	-1.13+ (.09)	-1.48* (.02)	-0.69 (.28)	-0.62 (.28)
DummyDecade80	-1.58** (.00)	-1.42** (.00)	-1.42** (.00)	-1.58** (.00)	-1.52** (.00)	-1.35** (.00)	-1.33** (.00)	-1.35** (.00)	-0.95* (.02)	-0.56 (.17)
Debt/GDP	-0.14** (.00)	-0.17** (.00)	-0.17** (.00)	-0.14** (.00)	-0.13* (.01)	-0.13** (.00)	-0.16** (.00)	-0.13* (.01)	-0.16** (.00)	-0.16** (.00)
DummyIncome	1.33** (.00)	1.13* (.03)	1.12** (.00)	1.33** (.00)	1.23* (.01)	1.02* (.03)	0.93+ (.07)	1.04* (.03)	0.72 (.15)	0.95* (.03)
GrowthPop.					-0.65* (.02)	-0.59* (.03)	-0.70* (.02)	-0.50+ (.08)	-0.69* (.02)	-0.44 (.10)
Inflation						-0.001* (.01)	-0.001+ (.07)	-0.001* (.03)	-0.001* (.04)	-0.001* (.01)
TradeOpenness								0.01 (.15)		
GrowthExports									0.16** (.00)	0.14** (.00)
FDI/GDP										0.34** (.00)
Within R-sq.	.31	.26	.25	.31	.31	.29	.26	.31	.35	.41
Between R-sq.	.41	.52	.52	.41	.59	.65	.73	.67	.88	.91
Overall R-sq.	.30	.27	.26	.30	.32	.34	.31	.35	.44	.49
Wald chi2	62.79	47.60	45.10	62.79	69.81	73.12	58.51	75.61	92.85	131.35
Prob> chi2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Number of observations	155	137	138	155	155	153	137	153	128	144

Note: The dependent variable is the growth rate of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the level of real GDP per capita at the beginning of every 5-year period

Ln(schoolYears) = Natural logarithm of the average years of schooling at the beginning of every 5-year period

Ln(secondaryEdu) = Natural logarithm of the mean years of secondary schooling at the beginning of every 5-year period

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

DummyDecade80 = Temporal dummy for the 80s

Debt/GDP = Total debt service (% of GNI)

Dummy Income = Dummy for upper middle income countries

GrowthPop = Population growth (annual %)

Inflation = Inflation, consumer prices (annual %)

TradeOpenness = Sum of exports and imports as a share of GDP

GrowthExport = Exports of goods and services (annual % growth)

FDI/GDP = Foreign direct investment, net inflows (% of GDP)

Source: Author's own preparation based on original estimations

⁴² Indeed, following econometric theory the estimations are more consistent and efficient, so RE is preferable to FE.

Table 2.6. Finance and growth: Initial value panel data estimations with random effects

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10
Constant	14.60** (.00)	14.27** (.00)	13.46** (.00)	14.60** (.00)	18.33** (.00)	16.34** (.00)	18.32** (.00)	15.99** (.00)	14.68** (.00)	13.60** (.00)
Ln(privatecredit1)	1.31** (.00)			1.32** (.00)	1.34** (.00)	1.08* (.01)		0.93* (.03)		0.93* (.02)
Ln(privateCredit2)		0.61+ (.06)					0.58+ (.07)		0.70* (.02)	
Ln(M2/GDP)			0.72+ (.06)							
Initial conditions										
Ln(Initial GDP)	-1.99** (.00)	-1.71** (.00)	-1.69** (.00)	-1.99** (.00)	-2.16** (.00)	-1.93** (.00)	-1.87** (.00)	-1.84** (.00)	-1.68** (.00)	-1.86** (.00)
Ln(schoolYears)	1.73* (.02)	1.50 (.13)	1.51 (.12)	1.73* (.02)	1.41+ (.07)	1.42+ (.06)	1.18 (.25)	1.29+ (.09)	1.05 (.30)	1.13 (.10)
Other control variables										
Ln(GovExpenditure)	-1.30* (.03)	-0.85 (.20)	-0.81 (.22)	-1.30* (.03)	-1.63* (.01)	-1.26+ (.06)	-1.26+ (.06)	-1.44* (.02)	-0.77 (.24)	-0.62 (.28)
DummyDecade80	-1.58** (.00)	-1.64** (.00)	-1.66** (.00)	-1.58** (.00)	-1.53** (.00)	-1.34** (.00)	-1.49** (.00)	-1.35** (.00)	-1.08* (.02)	-0.56 (.17)
Debt/GDP	-0.15** (.00)	-0.14* (.01)	-0.14* (.01)	-0.15** (.00)	-0.14* (.01)	-0.14** (.00)	-0.14** (.00)	-0.14** (.00)	-0.15** (.00)	-0.17** (.00)
DummyIncome	1.40** (.00)	1.04* (.04)	0.99+ (.05)	1.40** (.00)	1.30** (.00)	1.06* (.03)	0.96+ (.06)	1.08* (.02)	0.77 (.13)	0.97* (.03)
GrowthPop.					-0.65* (.02)	-0.58* (.03)	-0.58+ (.06)	-0.49+ (.08)	-0.64* (.04)	-0.45+ (.09)
Inflation						-0.001** (.00)	-0.001 (.12)	-0.001* (.02)	-0.001 (.10)	-0.001** (.00)
TradeOpenness								0.01 (.16)		
GrowthExports									0.15** (.00)	0.14** (.00)
FDI/GDP										0.34** (.00)
Within R-sq	.31	.26	.27	.31	.30	.29	.26	.31	.35	.41
Between R-sq	.41	.54	.59	.41	.59	.65	.73	.66	.81	.91
Overall R-sq	.29	.28	.28	.29	.31	.34	.31	.34	.43	.50
Wald chi2	60.24	46.55	46.93	60.24	67.03	72.26	53.91	74.70	82.34	132.07
Prob> chi2	.00	0.00	.00	.00	.00	.00	.00	.00	.00	.00
Number of observations	155	130	131	155	155	153	130	153	121	144

Note: The dependent variable is the growth rate of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

The estimated regressions 1 to 10 use the logarithm of the finance proxies at the beginning of every 5-year period (initial value).

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the level of real GDP per capita at the beginning of every 5-year period

Ln(schoolYears) = Natural logarithm of the average years of schooling at the beginning of every 5-year period

Ln(secondaryEdu) = Natural logarithm of the mean years of secondary schooling at the beginning of every 5-year period

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

DummyDecade80 = Temporal dummy for the 80s

Debt/GDP = Total debt service (% of GNI)

Dummy Income = Dummy for upper middle income countries

GrowthPop = Population growth (annual %)

Inflation = Inflation, consumer prices (annual %)

TradeOpenness = Sum of exports and imports as a share of GDP

GrowthExport = Exports of goods and services (annual % growth)

FDI/GDP = Foreign direct investment, net inflows (% of GDP)

Source: Author's own preparation based on original estimations

Therefore, the results of our RE panel estimations suggest that financial development is a factor leading to economic growth in Latin America and the Caribbean. Our results seem consistent with most of the existing panel empirical studies that examine the finance and growth nexus (i.e. Levine, et al. 2001; Rioja & Valev, 2004; Bertocco, 2008; Vaona, 2008; Barajas et al. (2012), among many others)⁴³. This consistency also holds if we compare our results to the work of Nazmi (2005) and

⁴³ A comprehensive summary of most of these studies is presented in the annexes.

Bittencourt (2010), which examined the finance and growth relationship for the Latin American region and also found evidence of the supply-leading hypothesis. Still, we also have to consider other works such as Gregorio and Guidotti (1995) and Blanco (2007) that did not find such evidence. However, we should also remember that a general shortcoming in all these studies about Latin America would be the small number of countries considered (between 5 and 12).

Even following the hypothesis that above a certain level financial development would become a drag for the economy, it seems that Latin American financial systems are far from being considered “too large.” Arcand et al. (2011) and Cecchetti and Kharroubi (2012) state that output volatility starts increasing when credit to the private sector reaches or surpasses 100% of GDP. In this respect, we must consider that the Latin American average for this ratio is around 50% in the whole region, and there are countries where this indicator does not reach even 20%, as, for example, in Argentina and Venezuela (De la Torre, 2012).

Although we believe there are strong (econometric and conceptual) arguments for choosing the RE models instead the FE models, we should not discard totally the possibility that FE estimations are valid and proper. If we could eliminate the bias introduced in the FE regressions due to the presence of the lagged dependent variable among the explanatory variables (initial GDP), it is possible that our panel evidence (FE and RE) would not fully support the “supply-leading hypothesis” about the relationship between finance and growth in the Latin American and Caribbean region.

2.6.2 Financial development and inequality

Cross-sectional estimations

In the case of pure cross-country analysis, we have looked at three different averaging periods, given the fact that we had three different sources for the inequality index (Texas, WB, and Deininger and Squire) and that they do not cover the same periods and even differ in countries. For example, the Texas index is available for 26 countries and covers the period 1963-1999. WB and Deininger and Squire Gini coefficients are available for fewer countries and years in the period 1980-2003 (22 and 16, respectively). The descriptive statistics of these three datasets are presented in Annex 2.6. On the basis of these datasets, we have applied the cross-sectional econometric analysis, including, as in the case of the finance-growth relationship, tests for heteroskedasticity, multicollinearity, and outliers.

A summary of the main estimations using as a measure of inequality the Texas inequality index is presented in Table 2.7. In most of the estimated regressions, we obtained negative coefficients for the three alternative indicators of finance that we considered (privatecredit1, privateCredit2, and M2/GDP). However, these coefficients were not significant in all the estimated equations.

Specifically, the coefficient was not significant in the estimated regressions where the initial value of the real per capita GDP was included. In this sense, a possible reason lies in the existence of correlation between our finance proxies and the initial per capita GDP, and also between some control variables and the initial GDP (See correlation matrix in Annex 2.9). Therefore, we also estimated regressions without including the initial value of GDP per capita (regressions 4-7 in Table 2.7). In all these estimated equations, our indicators of finance were significant (at 5 and 10%) and robust.

Moreover, in regressions 4 to 7, the indicators of finance were lagged⁴⁴ in order to correct for the possibility of reverse causation or simultaneity. Additionally, the Breusch-Pagan test of heteroskedasticity, the VIF analysis for multicollinearity, and the graphical test for outliers showed that there are no problems in these last estimations. Therefore, on the basis of these estimations we could conclude that financial development contributes to decreasing income inequality in Latin America and the Caribbean in the very long term. However, since in our estimations the endogeneity problem would be present (since the initial value approach only partially solves it and because it is

⁴⁴ Based on existing cross-section literature, we used the initial value of the finance proxy.

likely that we are incurring an omitted variable bias), we should not take such a conclusion as definitive.

Regarding the set of control variables, there are also some interesting conjectures related with income inequality. One of them is concerned with the indicator of economic growth, whose estimated coefficient was negative and significant at 5% in all the estimated regression. Therefore, we could think that higher output levels would mean lower inequality levels. Additionally, regarding other control variables we found some evidence suggesting that bigger participation by the modern sector, higher ethnological fractionalization, and higher government expenditure would increase inequality in the region. In contrast, high investment in human capital, a lower inflation rate, and more trade openness would reduce income inequality in Latin America and the Caribbean.

Table 2.7. Finance and inequality: Cross-sectional estimations (Texas Inequality Index)

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7
Constant	3.94** (0.00)	3.94** (0.00)	3.94** (0.00)	3.50** (0.00)	3.70** (0.00)	3.15** (0.00)	3.16** (0.00)
Ln(privatecredit1)	-0.024 (0.50)			-0.023 (0.10)	-0.042* (0.04)		
Ln(privateCredit2)		-0.008 (0.61)				-0.045* (0.04)	-0.043* (0.04)
Ln(M2/GDP)			-0.0008 (0.99)				
Control variables							
Ln(Initial GDP)	-0.075* (0.02)	-0.08* (0.01)	-0.08* (0.01)				
ModernSector/GDP	0.005** (0.00)	0.004* (0.01)	0.004* (0.01)	0.005** (0.00)	0.004* (0.03)	0.003* (0.03)	0.004* (0.01)
Ethno	0.0008 (0.12)	0.0009+ (0.07)	0.0009+ (0.08)	0.0009+ (0.08)	0.0007 (0.23)		
Ln(schoolingYears)				-0.06* (0.01)			
Ln(GovExpenditure)					0.029 (0.71)	0.23** (0.00)	0.19* (0.01)
Inflation					-0.016 (0.15)		
Ln(TradeOpenness)					-0.04 (0.32)		
Ln(SecondaryEdu)							-0.03 (0.32)
R squared	0.50	0.50	0.49	0.59	0.50	0.75	0.76
Adj. R squar.	0.38	0.37	0.36	0.49	0.29	0.69	0.65
F	4.05	3.96	3.83	5.80	2.36	11.42	7.09
Prob > F	0.02	0.02	0.02	0.00	0.08	0.00	0.00
Number observations	21	21	21	21	21	15	14

Note: The dependent variable is the natural logarithm of the Household Inequality Index and the Texas Project Ln (Ehiitex). Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively. Regressions 4 to 7 use the initial value of the finance proxy.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita (1970)

ModernSector/GDP = Modern Sector Value Added/GDP, value added of service and industrial sectors as share of GDP

Ethno= Ethnological Fractionalization

Ln(schoolYears) = Natural logarithm of the initial average years of school attainment (1970)

Ln(secondaryEdu) = Natural logarithm of the initial mean years of secondary schooling (1970)

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

Inflation = Inflation, consumer prices (annual %)

TradeOpenness = Sum of exports and imports as a share of GDP

Ln(SecondaryEdu) = Natural logarithm of the initial mean years of secondary schooling

Source: Author's own preparation based on original estimations

Additionally, we ran cross-country regressions considering as a measure of income inequality the Gini coefficient collected from WDI and Deininger and Squire. The estimated regressions are summarized in Annex 2.7 and 2.8, respectively. In most of the estimated regressions using these inequality measures, we found positive coefficients for our alternative indicators of financial development. Few of these coefficients were significant at 5 and 10%.

Although the cross-sectional evidence based on the Deininger and Squire's and WDI's Gini datasets looks contradictory to our evidence based on the Texas Inequality index, we cast doubt on the validity of these results. As mentioned, Deininger and Squire's and WDI's Gini datasets have important weak points, which are even referred to in the literature relating to the inequality issue. Furthermore, the number of available cross country and times series observations for Latin America and the Caribbean is lower than in the Texas project dataset. So we do not think that the evidence based on these two Gini datasets would lead to reliable conclusions.

Therefore, if we take as valid our cross-country evidence based on the Household Inequality Index dataset prepared by the Texas project, the narrowing inequality hypothesis seems to be true in the Latin American and Caribbean region.

Panel data estimations

For the panel analysis, despite the fact that most existing empirical evidence on finance and inequality applied random effects models, we also estimated fixed effects models. However, in order to determine the best model to structure the data, the Hausman test was run. In almost all cases, this test showed that there was not a significant difference between the FE and RE estimated coefficients. So based on the Hausman test, we could assume that RE models are better than FE. Table 2.8 summarizes our random effect regression outcomes.

We estimated the inequality regressions again regarding alternative indicators of finance, control variable sets, and three different sources of the inequality index (Texas, WB, and Deininger & Squire). Additionally, we included the square term of the finance indicators. The purpose was to test the inverted U inequality hypothesis for the finance-inequality relationship. However, in all of our estimations the quadratic finance term was not significant. Therefore, we discarded these estimations for the summary presented in Table 2.8.

On the basis of the Texas and WDI datasets, and applying the model of RE, most of the estimated coefficients of the financial development indicators were positive and significant at a 5% level, suggesting that the widening hypothesis is the right one for the case of Latin America and the Caribbean. The estimators stayed positive and significant using the initial value of the finance indicator in order to correct reverse causation as a possible cause of endogeneity. Instrumental variable estimations were not carried out given the shortcomings of our available instrumental variable in a panel data context.

Regarding Deininger and Squire's Gini dataset, we found positive coefficients for the indicators of financial development. However, none of these estimated coefficients were significant at 5%, nor at 10%. This situation did not change even after lagging the finance variable. Moreover, very few control variables were significant at levels of 5 and 10% (see Table 2.8).

In general, our panel data estimations seem to contradict the results of our pure cross-sectional ones. Cross-sectional results were pointing to a negative relationship between finance and inequality in the region. This apparent mixed (cross-section and panel data) evidence would suggest two facts: one, that financial development would be a factor increasing inequality in the medium and even long term, and two, that its potential benefit in terms of social fairness is only in the very long term (based on our cross-sectional evidence). In this sense, it is possible that in order for financial development to act as an income equalizer, there is a necessity for other previous or parallel conditions such as a certain minimal level of human capital or output growth, as it is revealed in the studies of Humaira (2012) and Canavire and Rioja (2009). Specifically, the work of Canavire and Rioja is based on panel data analysis covering data on 21 Latin American countries.

Additionally, there were could be some shortcomings related with endogeneity and our finance proxies, In the case of endogeneity, it is evident that through the initial value approach we have not totally solved the endogeneity problem. Therefore, it is possible that our panel estimations are biased.

With respect to our finance indicators, the issue is that they are not measuring the semiformal and informal finance, which is usually the kind that is attainable by low-income households and small firms. Moreover, there is the possibility that access to finance could be more important than financial development as a factor affecting inequality. And since a well-developed financial system is not necessarily inclusive, it is likely that the finance indicators used in our estimations are not capturing the access dimension of finance.

Table 2.8. Finance and inequality: Panel data estimations with random effects

Variables	Texas Inequality Index (ehiitex)					Gini World Bank Dev. Indicators (giniwb)					Gini Deininger & Squire (ginids)			
	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10	Regr. 11	Regr. 12	Regr. 13	Regr. 14
Constant	3.63** (0.00)	3.62** (0.00)	3.76** (0.00)	3.74** (0.00)	3.76** (0.00)	4.07** (0.00)	3.67** (0.00)	4.10** (0.00)	4.13** (0.00)	4.23** (0.00)	3.63** (0.00)	3.66** (0.00)	3.83** (0.00)	3.98** (0.00)
Ln(privatecredit1)	0.02** (0.05)	0.02* (0.07)				0.070** (0.01)	0.073** (0.01)	0.070** (0.01)	0.075** (0.00)		0.005 (0.76)	0.005 (0.78)		
Ln(privateCredit2)			0.02** (0.01)		0.02** (0.01)					0.04** (0.03)			0.0035 (0.77)	-0.003 (0.74)
Ln(M2/GDP)				0.03** (0.02)										
Control variables														
Ln(Initial GDP)	0.03** (0.00)	0.03** (0.00)				0.004 (0.90)					0.03 (0.23)	0.03 (0.31)		
ModernSector/GDP	-0.001** (0.00)	-0.001** (0.00)	0.0001 (0.81)	0.0001 (0.83)		-0.003 (0.18)		-0.003 (0.11)	-0.003* (0.07)	-0.003 (0.13)	-0.0002 (0.91)	-0.0002 (0.91)		0.0004 (0.81)
Ln(GovExpenditure)	-0.003** (0.02)	-0.002** (0.05)	-0.004** (0.04)	-0.004** (0.04)	-0.004** (0.02)	0.002 (0.49)	0.004 (0.28)	0.002 (0.49)			0.003 (0.17)	0.003 (0.26)	0.009** (0.00)	
Inflation	0.0000 (0.23)					-0.015** (0.04)	-0.0000 (0.37)	-0.016** (0.03)	-0.016** (0.02)	-0.021** (0.01)	0.0000 (0.88)	-0.002 ¹ (0.77)		-0.009* ¹ (0.10)
Ethno	0.0009* (0.09)	0.001* (0.08)	0.001* (0.07)	0.001 (0.11)	0.001** (0.05)	-0.0006 (0.47)		-0.0006 (0.46)			0.001 (0.17)	0.001 (0.19)	0.001 (0.15)	
Ln(TradeOpenness)					0.0006* (0.08)	-0.001** (0.01)	-0.001* (0.08)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)		-0.0000 (0.99)	0.0006 (0.28)	-0.0001 (0.85)
DummyIncome					-0.05** (0.02)		-0.08 (0.13)						-0.07* (0.07)	
Ln(schoolYears)							0.02 (0.72)							
Within R ²	0.30	0.30	0.13	0.13	0.16	0.11	0.15	0.11	0.08	0.09	0.09	0.09	0.09	0.08
Bet. R ²	0.00	0.00	0.10	0.05	0.28	0.43	0.16	0.45	0.49	0.45	0.15	0.16	0.40	0.03
Overall R ²	0.07	0.06	0.11	0.10	0.32	0.32	0.20	0.33	0.34	0.32	0.12	0.13	0.35	0.02
Wald chi2	29.60	25.73	12.09	10.79	23.58	17.40	13.21	17.88	18.90	17.67	5.19	5.17	11.70	2.67
Prob> chi2	0.00	0.00	0.00	0.02	0.00	0.01	0.04	0.00	0.00	0.00	0.52	0.63	0.03	0.61
Number observations	110	111	93	94	99	77	78	77	78	74	48	48	46	46

Note: The dependent variable is an alternative inequality index. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively. Regressions 6, 8, 9, 10, 12, and 14 use the estimated coefficient for the natural logarithm of the variable inflation instead of its level.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the level of real GDP per capita at the beginning of every 5-year period

ModernSector/GDP = Modern Sector Value Added/GDP, value added of service and industrial sectors as share of GDP

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

Inflation = Inflation, consumer prices (annual %)

Ethno = Ethnological fractionalization

Ln(TradeOpenness) = Natural logarithm of the sum of exports and imports as a share of GDP

Dummy Income = Dummy for upper middle income countries

Ln(schoolYears) = Natural logarithm of the average years of school attainment at the beginning of every 5-year period

Source: Author's own preparation based on original estimations

2.7 Conclusions

Economic theory predicts different relationships and feedback between finance and growth, as well as between finance and inequality. Regarding, the issue of growth, there are basically two hypotheses: the supply-leading hypothesis and the demand-following hypothesis. With respect to the relationship between finance and inequality, it is possible to distinguish three different hypotheses: the widening hypothesis, the narrowing hypothesis, and the inverted U-shaped hypothesis.

Most of the existing empirical evidence points to financial development as a promoter of growth and as reducing inequality. However, as a limitation, most of the empirical investigations seem to rely

excessively on general evidence. One important general lesson of the financial liberalization experience is the need for policy to be based on a careful consideration of country/region conditions and differences. A “one size fits all” approach to financial policy needs to be replaced by financial sector interventions that allow for the significant differences that exist in the economic and institutional characteristics of individual developing countries. Therefore, the necessity and importance of complementary and specific evidence about the Latin American and Caribbean region was highlighted in the present study.

The recent financial crisis increased the skepticism about the positive effect of finance on growth. Specifically, some empirical studies conducted after the crisis (i.e. Arcand et al., 2011; Cecchetti and Kharroubi, 2012) assert the hypothesis that financial development above a certain level would become a drag for the economy. However, we must be aware that this statement is nothing new and that already before 2007 some theoretical and empirical literature had considered this possibility. Some, such as Minsky (1974), Kindleberger (1978), Easterly et al. (2000), and Rajan (2005), already referred to a kind of threshold above which financial development has a negative impact on development. Others, such as Ranciere et al. (2006), show that financial fragility and consequently financial crisis are a kind of price in terms of volatility that economies have to pay, but as compensation they will be rewarded with higher growth.

In the case of the finance and growth nexus, regarding both cross-sectional and panel data analyses, alternative proxies of financial development, and control variable sets, our estimation results suggest that financial development is pro-growth in the Latin American and Caribbean region. This finding seems consistent with recent empirical literature, even following the thesis that above a certain level financial development would become a drag for the economy. As far as we know, Latin American financial systems are far from being considered “too large.” Arcand et al. (2011) and Cecchetti and Kharroubi (2012) note that output volatility starts increasing when credit to the private sector reaches or surpasses 100% of GDP. In this respect, it is important to take into account that the Latin American average of this ratio is around 50% in the whole region and that there are countries where this indicator does not reach even 20%. Therefore, financial development policies in the region would still have potential benefits in terms of growth.

With respect to the relationship between finance and inequality in the region, the evidence has two faces. On the one hand, we have cross-sectional evidence that seems to support the “narrowing inequality hypothesis.” On the other hand, our panel data analysis results support the “widening hypothesis.” These mixed and even contradictory findings have two possible interpretations: One is that financial development would be a factor increasing inequality in the medium and even long term and that its potential benefit in terms of social fairness only comes in the very long term. Perhaps, as Humaira (2012) and Canavire and Rioja (2009) suggest, in order for financial development to act as an income equalizer, there are some necessary previous or parallel conditions in the economy, such as a certain minimal level of human capital or output growth.

Another explanation would relate to endogeneity bias and possible shortcomings of our finance indicators, such as the issue that they are not measuring semiformal and informal finance, which is usually the kind that is attainable by the poor. Additionally, our study has focused on financial size and efficient measures, while more relevant aspects for inequality may be access and use of financial services. Unfortunately, data on this financial system dimension has only been collected recently and is only available for some countries and recent periods. Furthermore, the international cross-country datasets available for access and use have significant quality limitations, such as the fact that they do not have data on semiformal and informal financial institutions, which play an important role in the access and use of financial services.

References

- Acaravci, S. K., Ozturk, I., & Acaravci, A. (2009). Financial development and economic growth: Literature survey and empirical evidence from Sub-Saharan African countries. *SAJEMS NS* 12(1), 11-27.
- Aghion, P., Angeletos, G.M., Banerjee, A., & Manova, K. (2005). Volatility and growth: Credit constraints and productivity-enhancing. *NBER Working Papers*, No. 11349.
- Ahlin, C. A., & Pang, J. (2008). Are financial development and corruption control substitutes in promoting growth? *Journal of Development Economics*, 86, 414–433.
- Al-Tamimia, H., Al-Awadb, M., & Charifc, H. A. (2001). Finance and growth: Evidence from some Arab countries. *Journal of Transnational Management Development*, 7(2), 3-18.
- Al-Yousif, Y. K. (2002). Financial development and economic growth: Another look at the evidence from developing countries. *Journal of International Development*, 15(2), 189-209.
- Al-Awadb, M., & Nasri, H. (2005). Financial development and economic growth in the Middle East. *Applied Financial Economics of Financial Economics*, 11(2), 131-50.
- Allen, D., & Ndikumana, L. (2000). Financial intermediation and economic growth in Southern Africa. *Journal of African Economies*, 9(2), 132-60.
- Andersen, T., & Tarp, F. (2003). Financial liberalization, financial development and economic growth in LDCs. *Journal of International Development*, 15(15), 1041-51.
- Andersen, T., Jones, S., & Tarp, F. (2012). The finance–growth thesis: A skeptical assessment. *Journal of African Economies*, 21(1), i57-i88.
- Antonios, A. (2010). Financial development and economic growth: A comparative study between 15 European Union member–states. *International Research Journal of Finance and Economics*, 35,143-149.
- Arcand, J. L., Berkes, E., & Panizza, U. (2011). *Too much finance?* The Graduate Institute. IMF & UNCTAD.
- Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *Economic Journal*, 107, 783-799.
- Asongu, S. (2011a). Finance and growth: Schumpeter might be wrong in our era: New evidence from meta-analysis. *Munich Personal RePEc Archive, MPRA Papers*, No. 32559.
- Asongu, S. (2011b). Finance and inequality: Exploring pro-poor investment channels in Africa. *Munich Personal RePEc Archive. MPRA Papers*, No. 34994.
- Atindeou, R., Atindéhou, R. B., Gueyie, J.B., & Amenounvec, E. K. (2005). Financial intermediation and economic growth: evidence from Western Africa. *Applied Financial Economics*, 15, 777–790.
- Aziakpono, M. J. (2005). *Financial development and economic growth in Southern Africa*. Department of Economics. National University of Lesotho.
- Bagehot, W. (1873). *Lombard street: A description of the money market*. History of economic thought books. McMaster University Archive for the History of Economic Thought.
- Barro, R. (1997). *Determinants of economic growth: A cross country empirical study*. The MIT Press. The Lionel Robinson Lectures.
- Bhattacharya, P., & Sivasubramanian, M. (2003). Financial development and economic growth in India: 1970–1971 to 1998–1999. *Applied Financial Economics*, 13, 925-929.
- Bađun, M. (2009). Financial intermediation by banks and economic growth: A review of empirical evidence. *Financial Theory and Practice*, 33(2), 121-152.
- Barajas, A., Chami, R., & Reza, Y. (2012). *The finance and growth nexus re-examined: Do all countries benefit equally?* (Preliminary draft). IMF.
- Batuo, M., Guidi, F., & Mlambo, K. (2010). *Financial development and income inequality: Evidence from African countries*. African Development Bank.
- Beck, T. (2008). The econometrics of finance and growth, *World Bank Policy Research Working Paper No. 4608*.
- Beck, T. (2011). The role of finance in economic development: Benefits, risks, and politics. *European Banking Center Discussion Papers*, No. 2011(038).
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2000). A new database on the structure and development of the financial sector. *World Bank Economic Review*, 14(3), 597-605.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2002). Law and finance: Why does legal origin matter? *NBER Working Papers*, No. 9379.
- Beck, T., & Levine, R. (2004a). Legal institutions and financial development. *NBER Working Papers*, No. 10417.

- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2004b). Finance, inequality, and poverty: Cross-country evidence. *NBER Working Papers*, No. 10979.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12(1), 27-49.
- Beck, T., & Demirgüç-Kunt, A. (2009). Financial institutions and markets across countries and over time: Data and analysis. *World Bank Policy Research Working Papers*, No. 4943.
- Beck, T., Büyükkarabacak, B., Rioja, F., & Valev, N. (2009). Who gets the credit? And does it matter? Household vs. firm lending across countries. *European Banking Center Discussion Papers*, No. 2009(12).
- Beck, T., & Demirgüç-Kunt, A. (2012). *Financial structure* [Dataset]. Retrieved from www.worldbank.org.
- Becker, G., & Tomes, N. (1979). An equilibrium theory of the distribution of income and intergenerational mobility. *The Journal of Political Economy*, 87(6), 1153-89.
- Bekaert, G., Harvey, C., & Lundblad, C. (2005). Does financial liberalization spur growth? *Journal of Financial Economics*, 77(1), 3-55.
- Benhabib, J., & Spiegel, M. (2000). The role of financial development in growth and investment, *Journal of Economic Growth*, 5(4), 341-60.
- Bertocco, G. (2008). Finance and development: Is Schumpeter's analysis still relevant? *Journal of Banking and Finance*, 32, 1161-1175.
- Bezemer, D. J. (2011). *Finance and growth: When credit helps, and when it hinders*. University of Groningen. Conference Paper. Paradigm Lost: Rethinking Economics and Politics. Axica Conference Center & Federal Foreign Office, Berlin (April 12-15, 2012). Session: "Socially Useful Financial Systems."
- Blackburn, K. & Forgues-Puccio, G.F. (2010). Financial liberalization, bureaucratic corruption and economic development. *Journal of International Money and Finance*, 29(7), 1321-1339.
- Blanco, L. (2007). Is financial development really beneficial for Latin American countries? Working Paper, University of Oklahoma. Conference Paper. American Economic Association Meetings (January 2007).
- Bittencourt, M. (2010). Financial development and economic growth in Latin America: Is Schumpeter right? *University of Pretoria Working Papers*, No. 2010(14).
- Bolton, P., Santos, T., & Scheinkman, J.A. (2011). Cream skimming in financial markets. *NBER Working Papers*, No. 16804.
- Bouilila, G., & Trabelsi, M. (2004). The causality issue in the finance and growth nexus: Empirical evidence from Middle East and North African Countries. *Review of Middle East Economics and Finance*, 2(2), 123-38.
- Boyd, J. H., & Smith, B.D. (1992). Intermediation and the equilibrium allocation of investment capital: Implications for economic development. *Journal of Monetary Economics*, 30, 409-432.
- Brezigar-Masten, A., Coricelli, F., & Masten, I. (2008). Non-linear growth effects of financial development: Does financial integration matter? *Journal of International Money and Finance*, 27(2), 295-313.
- Brezigar-Masten, A., Coricelli, F., & Masten, I. (2010). Financial integration and financial development in transition economies: What happens during financial crises? *Documents de Travail du Centre d'Economie de la Sorbonne, CES Working Papers*, No. 2010(21).
- Bruderl, J. (2005). Panel data analysis. University of Mannheim. Bruderl, J. (2005). Retrieved from <http://www2.sowi.uni-mannheim.de/lsssm/veranst/Panelanalyse.pdf>.
- CAF (Corporación Andina de Fomento) (2011). *Financial services for development: Promoting access in Latin America*. Bogotá, Colombia: Andean Development Corporation Publications.
- Calderon, C., & Liu, L. (2003). The direction of causality between financial development and economic growth, *Journal of Development Economics*, 72(1), 321-334.
- Canavire-Bacarreza, G., & Rioja, F. (2009). Financial development and the distribution of income in Latin America and the Caribbean. *Discussion Paper Series - IZA DP*, No. 3796. Institute for the Study of Labor.
- Caporale, G. M., Rault, C., Sova, R., & Sova, A. (2009). Financial development and economic growth: Evidence from ten new EU members. *German Institute for Economic Research - Discussion Papers*, No. 940. Berlin, Germany.
- Cecchetti, S., & Kharroubi, E. (2012). Reassessing the impact of finance on growth. *Bank for International Settlements (BIS) - Working Papers*, No. 381.
- Clarke, G., Xu, L.C., & Zou, H. (2003). Finance and income inequality: Test of alternative theories, *World Bank Policy Research Working Papers*, No. 2984.
- Clarke, G., Xu, L. C., & Zou, H. (2006). Finance and income inequality: What do the data tell us? *Southern Economic Journal*, 72(3), 578-596.

- Cojocaru, L. (2011). *Financial development, growth, inequality and poverty: Evidence from the former Communist countries* (Doctoral dissertation). University of Delaware, No. 3473678.
- Christopoulos, D. K. & Tsonas, E.G. (2004). Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests. *Journal of Development Economics*, 73, 55-74.
- Dabos, M., & Williams, T. (2009). A re-evaluation of the impact of financial development on economic growth and its sources by regions. MPRA Paper from University Library of Munich. Retrieved from <http://mpra.ub.uni-muenchen.de/27297/>
- Dawson, P. J. (2003). Financial development and growth in economies in transition. *Applied Economics Letters*, 10(13), 833-36.
- Dawson, P. (2008). Financial development and economic growth: A panel approach. *Applied Economic Letters*, 1-5.
- De Gregorio, J., & Guidotti, P. (1995). Financial development and economic growth. *World Development*, 23(3), 433-48.
- De Hoyos, R. (2005). *Analisis de Datos de Panel*. University of Cambridge.
- De Ferranti, D., Perry, G., Ferreira, F., & Walton, M. (2004). *Inequality in Latin America and the Caribbean. Breaking with History?* Washington, D.C.: World Bank.
- De la Torre, A., Gozzi, J. C., & Schmukler, S. (2006). Financial development in Latin America: Big emerging issues, limited policy answers. *World Bank Policy Research Working Papers*, No. 3963.
- De la Torre, A., Gozzi, J. C., & Schmukler, S. (2007). Financial development: Maturing and emerging policy issues. *The World Bank Research Observer*, 22(1), 67-102.
- De la Torre, A., Ize, A., & Schmukler, S. (2012). *Financial Development in Latin America and the Caribbean: The Road Ahead*. Washington, D.C.: World Bank Publications 2012.
- Demetriades, P., & Andrianova, S. (2004). Finance and growth: What we know and what we need to know. In C. Goodhart, (ed) *Financial development and economic growth: Explaining the links*, 38-65. Basingstoke and New York: Palgrave Macmillan.
- Demetriades, P., & Hussein, K. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387-411.
- Demetriades, P., & Rousseau, P. (2011). *The changing face of financial development*. Retrieved from http://www.gla.ac.uk/media/media_222780_en.pdf.
- Demirgüç-Kunt, A., & Levine, R. (2009). Finance and inequality: Theory and evidence. *World Bank Policy Research Working Papers*, No. 4967.
- Demirgüç-Kunt, A., & Servén, L. (2009). Are all the sacred cows dead? Implications of the financial crisis for macro and financial policies. *World Bank Policy Research Working Papers*, No. 4807.
- Devereux, M. B., & Smith, G. (1994). International risk sharing and economic growth. *International Economic Review*, 35, 535-550.
- Ductor, L., & Grechyna, D. (2011). *Excess financial development and economic growth*. Department of Economics-University of Alicante & University of Auckland.
- Dollar, D., & Kraay, A. (2002). Growth is good for the poor. *Journal of Economic Growth*, 7(3), 195-225.
- Easterly, W., Islam, R., & Stiglitz, J. (2000). *Shaken and stirred, explaining growth volatility*. Annual Bank Conference on Development Economics. World Bank, Washington D.C.
- Fase, M., & Abma R. (2003). Financial environment and economic growth in selected Asian countries. *Journal of Asian Economics*, 14(1), 11-21.
- Favara, G. (2003). An empirical reassessment of the relationship between finance and growth. *IMF Working Papers*, No. 03/123.
- Favara, G. (2007). An empirical reassessment of the relationship between finance and growth. *National Centre of Competence in Research - Working Papers*, No. 396.
- Fecht, F., Huang, K. & Martin, A. (2004). Financial intermediaries, markets, and growth. *Federal Reserve Bank of Philadelphia Working Papers*, No. 04-24.
- Fissman, R., & Love, I. (2004). Financial development and growth in the short and long run. *NBER Working Papers*, No. 10236.
- Fink, G., Haiss, P., & Vuksic, G. (2006). *Importance of financial sectors for growth in accession countries*. Europe Institute - University of Economics and Business Administration, Vienna.
- FitzGerald, V. (2006). *Financial development and economic growth: A critical view*. Background paper for the World Economic and Social Survey 2006. Oxford University.

- Fowowe, B. (2011). The finance-growth nexus in Sub-Saharan Africa: Panel cointegration and causality tests. *Journal of International Development*, 23, 220–239.
- Fowowe, B., & Abidoye, B. (2012). The effect of financial development on poverty and inequality in African countries. *The Manchester School*, 81(4), 562–585. doi: 10.1111/j.1467-9957.2012.02302.x
- Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *Review of Economic Studies*, 60, 35–52.
- Ghirmay, T. (2004). Financial development and economic growth in Sub-Saharan African countries. *African Development Review*, 16(3), 415–432.
- Ghimire, B., & Giorgioni, G. (2009). *Puzzles in financial development and economic growth*. Liverpool Business School. United Kingdom.
- Goaied, M., & Sassi, S. (2011). Financial development, Islamic banking and economic growth evidence from MENA region. *International Journal of Business and Management Science*, 4(2), 105–128.
- Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98, 1076–1107.
- Gross, D. (2001). *Financial intermediation: A contributing factor to economic growth and employment*. Social Finance Programme, International Labour Office.
- Guiso, L., Sapienza, P., & Zingales, L. (2002). Does local financial development matter? *NBER Working Papers*, No. 8923.
- Gurley, J., & Shaw, E. S. (1955). Financial aspects of economic development. *American Economic Review*, 45(4), 515–38.
- Honohan, P. (2004). Financial development, growth, and poverty: How close are the links? *World Bank Policy Research Working Papers*, No. 3203.
- Humaira, A. (2012). *Effective financial development, inequality and poverty* (Doctoral dissertation). University of Exeter Business School.
- Hassan, K., Sanchez, B., & Yuc, J. S. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance*, 51, 88–104.
- Huang, Y., & Singh, R. J. (2009). Financial deepening, property rights, and poverty: Evidence from Sub-Saharan Africa. *IMF Working Paper*, WP/11/196. International Monetary Fund, African Department (2011).
- Jalilian, H., & Kirkpatrick, C. (2002). Financial development and poverty reduction in developing countries. *International Journal of Finance and Economics*, 7(2), 97–108.
- Jalilian, H., & Kirkpatrick, C. (2005). Does financial development contribute to poverty reduction? *Journal of Development Studies*, 41(4), 636–56.
- Jauch, S. & Watzka, S. (2012). Financial development and income inequality: A panel data approach, *CESIFO Working Papers*, No. 3687.
- Jiménez, L.F., & Manuelito, S. (2011). Latin America: Financial systems and financing of investment: Diagnostics and proposals. *CEPAL Review*, 103.
- Kaminsky, G., & Schmukler, S. (2003). Short-run pain, long-run gain: The effects of financial liberalization. *NBER Working Papers*, No. 9787.
- Kappel, V. (2010). The effects of financial development on income inequality and poverty. *CER-ETH Working Papers*, No 10/127. Center of Economic Research at ETH Zurich.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). Governance matters VIII: Aggregate and individual governance indicators 1996–2008. *World Bank Policy Research Working Papers*, No. 4978.
- Kindleberger, C. P. (1978). *Manias, panics, and crashes: A history of financial crises*. New York: Basic Books.
- Khan, A. (2000). The finance and growth nexus. In *Business Review* (pp. 3–14). Federal Reserve Bank of Philadelphia.
- Khan, A. (2001). Financial development and economic growth. *Macroeconomic Dynamics*, 5(3), 413–33.
- King, R. G. & Levine, R. (1993). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108(3), 717–737.
- Kiran, B., Yavuz, N. C., & Güriş, B. (2009). Financial development and economic growth: A panel data analysis of emerging countries. *International Research Journal of Finance and Economics*, 30, 87–94.
- Kirkpatrick, C. (2005). Finance and development: Overview and introduction. *The Journal of Development Studies*, 41(4), 631–635.
- Koeppl, T., Monnet, C., & Quintin, E. (2011). *A new perspective on financial development, inequality and growth*. Retrieved from http://www.econ.queensu.ca/files/other/KMQ_EER.pdf.

- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W. (1997). Legal determinants of external finance. *Journal of Finance*, 52(3), 1131–1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106(6), 1113–1155.
- Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 35(2), 688–726.
- Levine, R. (2002). Bank-based or market-based financial systems: Which is better? *Journal of Financial Intermediation*, 11(4), 398–428.
- Levine, R. (2003). More on finance and growth: More finance, more growth? *The Federal Reserve Bank*, St. Louis, 31–52.
- Levine, R. (2004). Finance and growth: Theory and evidence, *NBER Working Papers*, No. 10766.
- Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. Durlauf (Eds.), *Handbook of Economic Growth* (pp. 865–934). Elsevier.
- Levine, R., & Zervos, S. (1998). Stock markets, banks and economic growth. *World Bank Policy Research Working Papers*, No. 1690.
- Levine, R., Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2000). Financial structure and economic development: Firm, industry, and country. *World Bank Policy Research Working Papers*, No. 2423.
- Levine, R., Loayza, N., & Beck, T. (2001). Financial intermediation and growth: Causality and causes, *Journal of Monetary Economics*, 46(1), 31–77.
- Li, H., Squire, L., & Zou, H. (1998). Explaining international and intertemporal variations in income inequality. *The Economic Journal*, 108, 26–43.
- Loayza, N., Fajnzylber, P., & Calderón, C. (2004). Economic growth in Latin America and the Caribbean: Stylized facts, explanations and forecasts. *Working Papers of the Central Bank of Chile*, No. 265.
- Lopez, H. (2004). Pro-growth, pro-poor: Is there a tradeoff? *World Bank Policy Research Working Papers*, No. 3378.
- Lubker, M., Smith, G., & Weeks, J. (2002). Growth and the poor: A comment on Dollar and Kraay. *Journal of International Development*, 14, 555–571. doi: 10.1002/jid.911
- Luintel, K., & Khan, M. (1999). A quantitative reassessment of the finance-growth nexus: Evidence from a multivariate VAR. *Journal of Development Economics*, 60, 381–405.
- Lustig, N., Lopez-Calva, L., & Ortiz-Juarez, E. (2011). The decline in inequality in Latin America: How much, since when and why. *ECINEQ WP 2011 – 211*. Society for the Study of Economic Inequality.
- McCaig, B., & Stengos, T. (2005). Financial intermediation and growth: Some robustness results. *Economics Letters*, 88, 306–312.
- McKinnon, R. I. (1973). *Money and capital in economic development*. Washington, D.C.: Brookings Institution.
- Manning, M. (2003). Finance causes growth: Can we be so sure? *Contributions to Macroeconomics*, 3(1), <http://www.bepress.com/bejm/contributions/vol3/iss1/art12>.
- Minsky, H. P. (1974). The modeling of financial instability: An introduction. *Modelling and Simulation*, 5, 267–72.
- Mookerjee, R., & Kalipioni, P. (2010). Availability of financial services and income inequality: The evidence from many countries. *Emerging Markets Review*, 11, 404–408.
- Mookherjee, D., & Ray D. (2003). Persistent inequality. *Review of Economic Studies*, 70(2), 369–393.
- Mora, J. (2005). Socio economic development and poverty in Latin America and the Caribbean. *MPRA Papers*, No. 1529.
- Morley, S. (2001). *The income distribution problem in Latin America and the Caribbean*. ECLAC-United Nations. Santiago, Chile.
- Obstfeld, M. (1994). Risk-taking, global diversification, and growth. *American Economic Review*, 84, 1310–1329.
- Odedokun, M. O. (1996). Alternative econometric approaches for analysing the role of the financial sector in economic growth: Time-series evidence from LDCs. *Journal of Development Economics*, 50, 119–146.
- Oluitan, R. (2012). Financial development and economic growth in Africa: Lessons and prospects. *Business and Economic Research*, 2(2), 54–67.
- Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review*, 37, 613–622.
- Papaioannou, E. (2007). Finance and growth: A macroeconomic assessment of the evidence from a European angle. *European Central Bank Working Paper Series*, No. 787.
- Rajan, R. G. (2005). *Has financial development made the world riskier?* Proceedings of the 2005 Jackson Hole Conference organized by the Kansas City Fed.

- Ranciere, R., Tornell, A., & Westermann, F. (2006). Decomposing the effects of financial liberalization: Crises vs. growth. *NBER Working Papers, No. 12806*.
- Rachdi, H., & Mbarek, H. B. (2011). The causality between financial development and economic growth: Panel data cointegration and GMM system approaches. *International Journal of Economics and Finance, 3(1)*, 143-151.
- Rioja, F., & Valev, N. (2004a). Does one size fit all? A reexamination of the finance and growth relationship. *Journal of Development Economics, 74(2)*, 429-47.
- Rioja, F., & Valev, N. (2004b). Finance and the sources of growth at various stages of economic development. *Economic Inquiry, 42(1)*, 127-40.
- Rosner, B. (2010). The impact of financial development on poverty in developing countries. *The UCLA Undergraduate Journal of Economics*. Retrieved from www.uclaeconjournal.com/issues/w10/4.pdf.
- Rousseau, P.L., & Wachtel, P. (2008) What is happening to the impact of financial deepening on economic growth? Extension of a paper prepared for the UNU / WIDER conference on Financial Sector Development for Growth and Poverty Reduction, July 1-2, 2005.
- Ruiz-Porras, A. (2009). Financial structure, financial development and banking fragility: International evidence. *Análisis Económico, 56(24)*, 147-173.
- Saavedra, J., & Arias, O. (2005). Stuck in a rut. *Finance & Development, 42(4)*, 18-23.
- Saint-Paul, G. (1992). Technological choice, financial markets and economic development, *European Economic Review, 36*, 763-781.
- Sankar, D., Sarkar, S., Manpreet, S., & Vij, S. (2011). Finance, growth, and inequality: Channels and outcomes. SSRN:<http://ssrn.com/abstract=1713605> or <http://dx.doi.org/10.2139/ssrn.1713605>.
- Shan, J. (2005). Does financial development 'lead' economic growth? A vector auto-regression. *Applied Economics, 37(12)*, 1353-67.
- Shan, J., Morris, A., & Sun, F. (2001). Financial development and economic growth: An egg-and-chicken problem? *Review of International Economics, 9(3)*, 443-54.
- Shan, J., & Morris, A. (2002). Does financial development 'lead' economic growth? *International Review of Applied Economics, 16(2)*, 153-168.
- Shaw, E. (1973). *Financial deepening in economic development*. New York: Oxford University Press.
- Schumpeter, J. A. (1912). *The Theory of Economic Development*. Cambridge: Harvard University Press, 1934.
- Spiegel, M. (2001). Financial development and growth: Are the APEC nations unique? *Pacific Basin Working Paper Series, No. 01-04*.
- Stallings, B., & Studart, R. (2006). *Financiamiento para el desarrollo: Latino América en una perspectiva comparada*. ECLAC - United Nations. Washington, D.C.
- Tadesse, S. (2005). Financial development and technology. *The William Davidson Institute Working Papers, No. 749*.
- Tobin, J. (1984). On the efficiency of the financial system. *Lloyds Bank Review, 153*, 1-15.
- Trabelsi, M. (2002). Finance and growth: Empirical evidence from developing countries 1960-1990. Working Paper 0228. ERF Working Paper Series.
- Vaona, A. (2008). *Regional evidence on financial development, finance term structure and growth*. *Empirical Economics, 34 (1)*, 185-201.
- Venegas-Martínez, F. & Rodríguez-Nava, A. (2014). Is there a relationship between financial development and economic growth in Latin American countries with higher per capita GDP? *The IEB International Journal of Finance, 9*, 8-21.
- Verbeek, M. (2000). *A guide to modern econometrics*. West Sussex, England: John Wiley & Son.
- Wachtel, P., & Rousseau, P. (2006). What is happening to the impact of financial deepening on economic growth? *New York University Working Papers, No. 06-15*. Leonard N. Stern School of Business, Department of Economics.
- World Bank (2010). *Global economic prospects: Crisis, finance, and growth*. Washington, D.C. The International Bank for Reconstruction and Development and World Bank.
- World Bank (2012). *World Development Indicators, 2012 [Dataset]*. Retrieved from www.worldbank.org.
- Xu, Z. (2000). Financial development, investment, and economic growth. *Economic Inquiry, 38(2)*, 331-344.
- Yay, G., & Oktayer, A. (2009). Financial development and economic growth – A comparative analysis. *Romanian Journal of Economic Forecasting, 3*, 56-74.
- Zang, H., & Kim, Y. C. (2007). Does financial development precede growth? Robinson and Lucas might be right. *Applied Economics Letters, 14(1)*, 15-19.

ANNEX 2.1: REVIEW OF EMPIRICAL EVIDENCE ON FINANCE-ECONOMIC GROWTH (1993-2012)

Study	Author(s)	Main Goal (s)	Econometric Techniques	Sample/ Period	Dependent Variables/ Indicators	Explanatory Variables / Indicators	Main Findings
Finance and growth: Schumpeter might be right	King, R., & Levine, R. (1993)	To study the relationship between finance and long-term output growth To explore the channels through which financial development is linked to growth by examining two sources of growth (capital accumulation and improvements in economic efficiency)	Cross-section analysis	80 countries, developed and developing, for period 1960-89 (Average data)	Growth rate of per capita GDP	FINANCIAL DEPTH (Size of the formal financial intermediary sector relative to economic activity measured by the ratio of liquid liabilities of the financial system to GDP) BANK (Importance of specific financial institutions measured by the ratio of deposit money banks' domestic assets to deposit money banks' domestic assets plus central bank domestic assets) PRIVATE and PRIVY (Domestic asset distribution measured by the ratio of claims of the non-financial private sector to total domestic credit and ratio of the non-financial private sector to GDP)	-The average level of financial development for 1960-89 is very strongly associated with growth for the study period. -Financial development precedes growth. Financial depth in 1960 is positively and significantly related to real per capita GDP growth over the next 30 years even after controlling for a variety of country-specific characteristics and policy indicators. -Higher levels of financial development are strongly associated with future rates of capital accumulation and future improvements in the efficiency. -The results are consistent with Schumpeter's view that financial development stimulate economic growth.
Financial development and economic growth	De Gregorio, J., & Guidotti, P. (1995)	To re-examine the empirical relationship between financial development and long-term growth by using the ratio of bank credit to the private sector to GDP as indicator of financial development	Cross-country analysis White's robust procedure was used to conduct estimations and compute the standard error Data panel analysis	Cross-sectional data of countries used by Barro (1991), which comprises about 100 countries from 1960-1985 Panel data of 12 Latin American countries, using 6-year average data for 1950-85, examined by Gregorio (1992)	Real per capita GDP	Ratio bank credit to the private sector to GDP as measure of finance Investment rate Primary school enrollment & secondary school enrollment initial year and literacy rate as proxy for human capital Foreign investment Inflation GDP per capita in 1960 Government spending Revolutions and coups per year Index of assassinations	Based on Barro's (1991) dataset, a positive effect of financial development on long-term growth was found. The results suggest that the effect of financial intermediation on growth is due mainly to its impact on efficiency of investment rather than its volume. This relative importance of improved investment is higher in low and middle-income countries than in high-income countries. For the case of Latin America, a robust and negative correlation between finance and growth was found. This effect, which may appear puzzling, is interpreted in light of the extreme experiments with financial liberalization in the region.
Does financial development cause economic growth? Time series evidence from 16 countries	Demetriades, P., & Hussein, K. (1996)	To examine the causality relationship between financial development and economic growth from a time series perspective using recently developed econometric techniques	Stationary, cointegration, and causality tests	Time series data from 16 countries (Costa Rica, El Salvador, Greece, Guatemala, Honduras, India, Korea, Mauritius, Pakistan, Portugal, South Africa, Spain, Sri Lanka, Thailand, Turkey, and Venezuela)	Real GDP per capita measured in domestic currency as opposed to US dollars	The ratio of bank deposit liabilities to nominal GDP as a measure of financial development Ratio of bank claims on the private sector to nominal GDP as a measure of the extent of financial intermediation	-Evidence provides very little support for the view that finance is a leading sector in the process of economic growth. Most of the evidence suggests a bi-directional relationship between financial development and economic growth. -From the causality tests the results are very country-specific. This highlights the dangers of lumping together in cross-sectional equations countries with very different experiences in relation to financial development, which may reflect different institutional characteristics, different policies, and differences in their implementation.

Alternative econometric approaches for analyzing the roles of the financial sector in economic growth: Time series evidence from LDCs	Odedokun, M.O. (1996)	To determine and analyze the effects of financial intermediation on the growth of real GDP in LDCs	Regression estimations for each country using the OLS technique Where the presence of first-order serial correlation was detected based on the D-W statistic, the original data was transformed with the first-order serial correlation coefficient	Annual data for 71 countries over varying periods that generally span the 1960s and 1980s	Annual growth rate of real GDP (line 99bp of the IFS)	Population growth as measure of labor force growth (line 99z of the IFS) Investment GDP ratio as gross nominal fixed capital formation (line 93e of the IFS) plus the increase in nominal stocks (line 93i of the IFS), both divided by the nominal GDP (line 99b of the IFS) Real export growth as the annual growth rate of real exports of goods and non-factor services (The real value was calculated using the GDP deflator (line 99bip of the IFS) to divide the nominal exports of goods and non-factor services (line 90c of the IFS)) Financial depth the ratio of the average of the nominal value of the stock of liquid liabilities (line 551 of the IFS) to the nominal annual GDP.	-Financial intermediation promotes economic growth in about 85% of the countries. -As compared with factors that have often been emphasized in the literature as important growth promoters, financial intermediation is practically on par with export expansion and capital formation ratio, and superior to labor force growth, as partners in promoting growth. -The growth promoting effects of financial intermediation are more predominant in low income than in high-income LDCs, and these effects are practically invariant across the various regions of the globe.
Financial intermediation and economic growth in Southern Africa	Allen, D., & Ndikumana, L. (1998)	To investigate the role of financial intermediation in stimulating economic growth for members of Southern Africa	Panel data analysis using three different techniques: simple OLS regressions, regressions including country-specific fixed effects, and regressions including a high-income dummy	Annual data for the period 1970-1996 for 8 countries (Botswana, Lesotho, Mauritius, Malawi, Swaziland, South Africa, Zambia, and Zimbabwe).	Growth of real per capita GDP	Financial development measured by credit to the private sector, the volume of credit provided by banks and liquid liabilities of the financial system (measured by M3) as a percent of GDP, and composite index of financial development combining these three indicators Inflation measured as the annual percentage change in the GDP deflator (at base 1987), lagged one year Government consumption as a percent of GDP Openness measured as the sum of imports and exports as a percentage of GDP Debt service as a ratio to GNP	The results lend some support to the hypothesis that financial development is positively correlated with the growth rate of real per capita GDP. This relationship is more evident in regressions that use pooled data (5-year cross-sections) than those using annual data. The findings suggest that the finance-growth nexus is a long-term phenomenon.
Stock markets, banks, and economic growth	Levine, R., & Zervos, S. (1998)	To empirically investigate whether measures of stock market liquidity, size, volatility, and integration with world capital markets are robustly correlated with current and future rates of economic growth, capital accumulation, productivity improvements, and saving rates	Cross-country analysis	Annual data on 47 countries for the period 1976-1993	Growth of real per capita gross domestic product Productivity growth measured as output growth minus 0.3 times capital stock growth	CAPM Integration and APT integration Black market premium Exchange rate premium Capital stock growth Capitalization Government consumption share of GDP Rate of change in the GDP deflator Initial real per capita GDP 1976 (log) Logarithm of the secondary school in 1976 Revolutions and coups Gross private saving as percent of GDP Exports plus imports divided by GDP Turnover: value of the trades of domestic shares on domestic exchanges over the year divided by the average value of domestic shares listed on domestic exchanges Value of the trades of domestic shares on domestic exchanges over the year divided by GDP Measure of the volatility of stock returns, based on the stock market index value	After controlling for many factors associated with growth, stock market liquidity and banking development are both positively and robustly correlated with contemporaneous and future rates of economic growth, capital accumulation, and productivity growth. Since measures of stock market liquidity and banking development both enter in the growth regressions significantly, the findings suggest that banks provide different services from those provided by the stock markets. There is strong evidence of a positive link between financial development and economic growth, and the results suggest that financial factors are an integral part of the growth process.

Financial development and economic growth: Additional evidence	Ram, (1999)	R. To show that contrary to the conclusions reached in several studies, the empirical evidence does not support the view that financial development promotes economic growth	Correlation analysis and individual country regressions of simple growth models	Annual data for 95 countries for the period 1960-1989 5-year average data for 39 countries that had at least 25 data points. Averages are for the periods 60-64, 64-68, 68-72, 72-76, 76-80, and 80-84.	Growth of real GDP (total and per capita)	DEPTH calculated as the ratio of current price liquid liabilities to GDP Annual growth rate of population as an indicator of labor force Annual growth rate of exports Ratio of gross domestic investment to GDP	Correlation between financial development and growth is negligible or weakly negative. The average individual country correlation presents a sharp contrast to the cross-country correlation between the same variables and indicates that the cross-country estimates that have been used in most studies might be spurious. Future research may include a greater focus on individual country studies and an exploration of parametric heterogeneity across the sample subgroups in cross-country data.
A quantitative reassessment of the finance-growth nexus: Evidence from a multivariate VAR	Luintel, K., & Khan, M. (1999)	To examine the long-term causality between financial development and economic growth in a multivariate vector autoregression (VAR)	Multivariate vector autoregression (VAR)	Annual data for 10 countries for the period 1951-1955 (Colombia, Costa Rica, Greece, India, Korea, Malaysia, Philippines, Sri Lanka, South Africa, and Thailand)	Real per capita capital stock	Financial depth measured as the ratio of total deposits liabilities of deposit banks to one period lagged nominal GDP The logarithm of real per capita output measured as a ratio of real GDP to total population Real interest rate (deflated by inflation)	Bi-directional causality between financial development and economic growth was found in all the sample countries analyzed. This finding is different from those reported in the existing bi-variate time series studies (Demetriades and Hussein, 1996). The later studies report mixed results on the direction of causality, which would suggest that the bi-variate time series studies could be misspecified.
Financial development, investment, and economic growth	Xu, Z. (2000)	To identify the effects of permanent financial development on domestic investment and output	Multivariate vector autoregressive (VAR) Impulse response analysis	Annual data of 41 developing countries with representation abroad in geographical and income level terms for the period 1960-93	Real GDP Real Domestic Investment	Financial development index (Liquid liabilities of the financial intermediary sector are measured by the sum of money and quasi-money (M2) less currency, that is, total bank deposits. Since M2 and currency are stock variables measured at the end of the year and GDP is a flow variable measured over the year, some adjustment were necessary. The index is built as the total bank deposits in GDP, using the geometric mean of this year's bank deposits and last year's bank deposits divided by GDP.)	The results reject the hypothesis that financial development simply follows economic growth and has very little effect on it. Instead there is strong evidence that financial development is important for growth and that investment is an important channel through which financial development affects growth.
Bank-based or market based financial systems: Which is better?	Levine, (2000)	R. To explore the relationship between economic performance and financial structure	Cross-country analysis with one observation per country	Averaged annual data for 48 countries over the period 1980-1995	Real per capita GDP	Bank credit ratio Private credit ratio Market capitalization ratio Overhead costs Initial per capita GDP Black market premium Bureaucratic efficiency Civil liberties Corruption Government expenditures as share of GDP Inflation rate Legal origin (Dummy) Rule of law (Dummy) Schooling Total value traded ratio	The data does not provide evidence for the bank-based or market-based views. So distinguishing countries by financial structure does not help in explaining cross-country differences in long-term economic performance. The cross-country data strongly supports the financial services view. So distinguishing countries by their overall level of financial development helps to explain cross-country differences in economic growth.

The role of financial development in growth and investment	Benhabib, J., & Spiegel, M. (2000)	To examine whether financial development affects growth solely through its contribution to growth in "primitives" or factor accumulation rates, or whether it also has a positive impact on total factor productivity growth	Data panel analysis with and without the inclusion of country specific fixed effects Regression estimation obtained through generalized methods of moments (GMM)	Data grouped into balanced panels of 5-year periods from 1965-1985 for an unknown sample of countries	GDP (PWT5.6) Physical capital stock (Dhareshwar & Nehru 1993 and PWT 5.6) Average years of schooling for adults over 25 years of age (Barro Lee 1993)	DEPTH measured as the ratio of liquid liabilities of the financial sector to GDP BANK calculated as the ratio of deposit money bank domestic assets to deposit money bank assets plus central bank domestic assets. PRIV/Y ratio of claims on the non-financial private sector to GDP DEPTH, BANK, and PRIV/Y are constructed on basis of Levine (2003) DEPTHGini: Interactive term that relates financial development with income distribution DEPTHGDP: Interactive term that relates financial development with initial income Labor force (PWT 5.6) Average of annual growth of exports	The results indicate that financial development positively influences both rates of investment (physical and human capital accumulation) and total productivity growth. However, different indicators of financial development appear to be important for different components of growth. It appears that that the overall debts of the financial sector and the private sector's share of credit relative to GDP both influence growth through enhanced total factor productivity, while the size of the banking sector influences both physical and human capital accumulation.
Financial intermediation and growth: Causality and causes	Levine, R. et al. (2001)	-To evaluate the causal influence of financial intermediary development on economic growth - To evaluate whether cross-country differences as particular legal and accounting system characteristics, explain cross-country differences in the level of financial development	Cross-sectional analysis Differenced and system panel analysis (the use of the first differences is required to deal with the likely endogeneity of explanatory variables, giving rise to the possibility of simultaneity and reverse causality)	71 countries, developed and developing, for a cross-sectional analysis over 1960-1995 (average data) 74 developing and developed countries for the panel analysis over 1961-95 (Average data over non-overlapping 5-year periods)	Growth rate of the real per capita Gross Domestic Product	LIQUID LIABILITIES (liquid liabilities of the financial system divided by GDP) COMMERCIAL-CENTRAL BANK (ratio of commercial bank assets divided by commercial bank plus central bank assets) PRIVATE CREDIT (value of credits by financial intermediaries to the private sector divided by GDP) CONDITIONING SET (constant, logarithm of initial per capita GDP and the initial level of education attainment plus measures of government size, inflation, the black market exchange rate premium, and openness to international trade plus measures of political stability and ethnic diversity) Instrumental variables of financial intermediary development (Dummy variables to distinguish legal framework)	The cross-sectional and dynamic panel estimates suggest that financial intermediary development exerts a large and positive causal impact on economic growth.
Financial development and economic growth: An egg-and-chicken problem?	Shan, J. et al. (2001)	To present further evidence concerning the debate over whether financial development leads economic growth in a Granger causality sense	Granger causality procedure Vector autoregression model (VAR)	Quarterly data for a sample of nine OECD countries and China Because a principal concern was to use the same variables for all of the countries in the study, it was not possible to use the same sample period throughout	OUTPUT defined as the real per capita GDP	BANK CREDIT defined as the ratio of loans made to the private sector by commercial banks and other deposit-taking banks to GDP TOTAL FACTOR PRODUCTIVITY measured as the weighted average of labor and capital productivity where the weights are the shares of these factors in national income TRADE defined as the ratio of the sum of imports and exports to GDP INV measured as the ratio of total capital expenditure to GDP CPI measured as the consumer price index because of the impact of inflation on monetary aggregates STK index of the stock market prices to capture the effect of stock market development on economic growth	Little support to the financial development-led economic growth hypothesis. Evidence of reverse causality in some countries and bi-directional causality in others. No evidence of one-way causality from finance to growth. The study also supports the findings of Arestis & Demetriades (1997) and Demetriades & Hussein (1997) that the relationship between finance and growth may be country-specific, and the use of time series data, as opposed to cross-sectional data, is more revealing. Financial sector would not be necessarily a leading sector in the course growth and its importance, both theoretically and for economic policy considerations, may have been overstated.

Financial development and growth: Are the APEC nations unique?	Spiegel, M. (2001)	To examine whether financial development affects growth solely through its contribution to growth in factor accumulation rates or whether it also has a positive impact on total factor productivity, in the manner of Benhabib and Spiegel (2000) To examine whether the growth performance of a sub-sample of APEC countries are uniquely sensitive to levels of financial development	Data panel analysis	Data grouped into balanced panels of 5-year periods from 1965 to 1985	Same variables and indicators of Benhabib and Spiegel (2000)	Same variables and indicators of Benhabib and Spiegel (2000)	Evidence that financial development has a positive impact on both total factor productivity growth and rates of factor accumulation. Different types of financial development are important for different channels of economic growth. Without accounting for country-specific fixed effects, it was found that the liquidity measure of the ratio of financial assets of the private sector to GDP, $PRIV/Y$, significantly enhances rates of total factor productivity growth. Without accounting for country-specific fixed effects, all of the finance indicators were shown to significantly increase the rates of physical capital accumulation. In the case of human capital accumulation, only the BANK variable entered as a significant predictor, and it was robust to the inclusion of country-specific fixed effects. The $PRIV/Y$ variable also entered positively into the determinants of rates of human capital accumulation after accounting for country-specific effects.
Stock markets, banks, and growth: Panel evidence	Beck, T. & Levine, R. (2002)	To measure the effect of stock markets and banks on economic growth	GMM techniques developed for dynamic panels	International data for the period 1976-98 (averaging data for every 5 years)	Real per capita GDP growth	Turnover ratio (market liquidity) Value traded (the value of the trades of domestic shares on domestic exchanges to GDP) Market capitalization, as the value of listed shares divided by GDP Bank credit to GDP Initial real GDP per capita (Initial conditions) Average years schooling Black market premium Share of exports and imports to GDP Inflation rate Ratio of government expenditures to GDP	Stock markets and banks positively influence economic growth and these findings are not due to potential biases induced by simultaneity, omitted variables, or unobserved country-specific effects.
Finance and growth: Empirical evidence from developing countries 1960-1990	Trabelsi, M. (2002)	To examine the empirical relationship between financial intermediation and economic growth	Cross-country and panel data regressions	Annual data for 69 developing countries for the period 1960-1990 (15 Latin American countries without including Bolivia)	Per capita GDP growth rate	Ratio of the money stock M3 to nominal GDP (M3Y) Ratio of government spending to GDP Investment ratio Openness rate of the economy measured by the ratio of exports and imports over GDP Inflation rate using the consumer prices index	Financial development is a significant determinant of economic growth in cross-sectional regressions. Financial markets cease to exert any effect on real activity in panel data regressions. The paradox may be explained, in developing countries, by the lack of an entrepreneurial private sector capable of transforming the funds into profitable projects. The effect of financial development on growth is channeled mainly through an increase in investment efficiency.

Does financial development lead economic growth?	Shan, J., & Morris, A. (2002)	To study the causality issue in the relationship between finance and growth To consider the impact of financial development on investment and productivity	Toda & Yamamoto causality testing procedure VAR	Quarterly time series data from 19 OECD countries and China for the period 1985-1998	Rate of change of real GDP	Ratio of total credit to GDP Spread between borrowing and lending rates of interest (as an indicator of efficiency) Official interest rate defined as the overnight cash rate that is indicative of the stance of the government's monetary policy and is a proxy for the cost of borrowing throughout the financial sector Stock market price to capture the effects of stock market development and consequently growth Consumer price index in order to control for the effects of inflation on financial aggregates Ratio of total trade to GDP Ratio of gross investment to GDP	Little support to the hypothesis that financial development leads economic growth. No evidence of causality in some countries, but found evidence of reverse causality and bi-directional causality in others. The few countries in which they found evidence of one-way causality from financial development to economic growth were insufficient to draw general conclusions. The results support the conclusions of Arestis & Demetriades (1997) and Demetriades & Hussein (1996) that the link between financial development and economic growth may be country-specific and is perhaps influenced by differences in industrial structures and cultures.
Does one size fit all? A re-examination of the finance and growth relationship	Rioja, F., & Valev, N. (2002)	To demonstrate that the relationship between financial development and growth may not be uniform, but varies according to the level of financial development of the country	Dynamic panel analysis, applying generalized method of moments	Annual data of 74 countries for the period 1960-1995	GDP per capita growth	Private credit (credit issued by deposit money banks and other financial institutions to the private sector as percent of GDP) Liquid liabilities Commercial vs. central banks Initial GDP per capita Average years of secondary schooling Government size Openness to trade Inflation rate Black market premium Temporal dummies (i.e. Dummy 65-70, 71-75)	The effect of finance is not uniformly positive, and even when positive its size differs. Financial development exerts a strong positive impact on economic growth only once it has reached a certain threshold in what the authors call the "middle" region. In the "low" region the effect is uncertain, as different empirical measures of financial development suggest a negative effect, zero effect, or a positive effect. At the other end, in the "high" region, the growth effect of financial development declines once it reaches very high levels.
An empirical reassessment of the relationship between finance and growth	Favara, G. (2003)	To re-examine the empirical relationship between financial development and economic growth, presenting evidence using an updated dataset, a variety of econometric methods, and two standard measures of financial development	Cross-sectional and panel data analysis with estimations based on GMM	Unbalanced panel data of 85 countries for the period 1960-1998 In contrast with LLB (2001), a larger number of countries, mainly African, is included and for a longer time	Real per capita GDP growth	Level of liquid liabilities of the banking system Amount of credit issued to the private sector by banks and other financial institutions (Both indicators are deflated and expressed in percentage of real GDP) Initial levels of real per capita GDP Average years of attainment of secondary and higher education Government consumption to GDP Level of inflation rate Ratio of exports plus imports over GDP (Similar to Levine, Loayza, and Beck, 2001)	In contrast with the evidence of Levine, Loayza, and Beck (2001), cross-sectional and panel data instrumental variable regressions reveal that the relationship between finance and growth is weak. There is evidence of non-linearities in the data, suggesting that finance matters for growth only at intermediate levels of financial development. Using a procedure appropriately designed to estimate long-term relationships in a panel with heterogeneous slope coefficients, there is no clear indication that finance spurs economic growth. Instead, for some specification, the relationship is puzzlingly negative.
Finance causes growth: Can we be so sure?	Manning, M. (2003)	To examine the empirical foundations of previous studies that found a causal link between finance and growth	Rajan & Zingales and Levine & Zervos methodologies	Datasets used by Levine & Zervos (1998) and Rajan & Zingales (1998) Period 1976-1993	Growth of real GDP per capita (Levine and Zervos)	-Domestic credit: Stock of domestic credit allocated to the private sector by depository institutions and the central bank to GDP - Accounting standards: Accounting standards data for Levine and Zervos' 47-country sample obtained from La Porta et al. (1998) - Bank credit: The stock of domestic credit by commercial and deposit-taking banks allocated to the private sector, divided by GDP	Finance has a greater impact upon growth in non-OECD countries, with bank finance of particular importance. Cross-country studies remain plagued by the high correlations between financial, institutional, legal and regional factors, which make it extremely difficult to isolate the true impact of finance upon growth.

		To perform some additional econometric tests using the datasets and methodologies of Rajan & Zingales (1998) and Levine & Zervos (1998)				<ul style="list-style-type: none"> - Stock market capitalization: The average value of listed domestic shares on domestic exchanges, divided by GDP - Stock market turnover: The value of the trades of domestic shares on domestic exchanges, divided by the average capitalization of the domestic stock market - Stock market value traded: The value of the trades of domestic shares on domestic exchanges, divided by GDP - Initial log GDP per capita - Human capital: Logarithm of the secondary school enrollment rate in 1976 - Government consumption share of GDP: Initial value (1976) - Inflation: Initial value (1976) -Rate of change in the GDP deflator, or if unavailable, the CPI - Black market exchange rate premium: Initial value (1976) -Revolutions and coups: The number of revolutions and coups per year, averaged over the 1980s 	A more fruitful way forward may be to focus attention on long-range historical studies covering a small number of countries at similar stages in their economic development or individual country studies.
The direction of causality between financial development and economic growth	Calderon, C., & Liu, L. (2003)	To examine the direction of causality between financial development and economic growth	Geweke decomposition test on pooled data	Annual data of 109 developing and industrial countries for the period 1960-1994 Panel of seven non-overlapping 5-year period observations over the sample period	Real GDP per capita (growth and log levels) is taken from the Summers and Heston Penn World Tables 5.6	Financial measures: M2/GDP is computed using the formula $0.5 * [M2t / CPIt + M2t - 1 / CPIt - 1] / GDPt$, where the broad money M2 is line 35l from the International Financial Statistics (IFS) and the CPI (1987 = 100) and GDP (1987 LC) are from the WDI (1998) CREDIT/GDP is calculated using the formula $0.5 * [CREDITt / CPIt + CREDITt - 1 / CPIt - 1] / GDPt$, where private credit (CREDIT) is line 32d from the IFS. The CPI (1987 = 100) and GDP (1987 LC) are from the WDI (1998) Other growth determinants: Human capital is proxied by the % of secondary school attained over age 15 in total population. General government consumption as % GDP) Black market exchange rate premium	Financial development generally leads to economic growth. The Granger causality from financial development to economic growth and the Granger causality from economic growth to financial development coexist. Financial deepening contributes more to the causal relationships in the developing countries than in the industrial countries. The longer the sampling interval, the larger the effect of financial development on economic growth. Financial deepening propels economic growth through both a more rapid capital accumulation and productivity growth, with the latter channel being the strongest.
Financial development and growth in economies in transition	Dawson, P. J. (2003)	To test the hypothesis that financial development promotes economic growth for 13 Central and East European Countries (CEECs) during transition	Panel data analysis	Balanced panel of annual data for 13 CEECs for 1994–1999	GY growth rate of real gross domestic product (GDP)	GL growth rate of labor I/Y growth rate of capital or the investment divided by GDP DEPTH as indicator of financial development, which is the liquid liabilities divided by GDP GM as the growth rate of liquid liabilities	Results show that financial development, as measured by liquid liabilities as a proportion of gross domestic product, has an insignificant effect on economic growth. So economic performance in CEECs is not constrained by underdeveloped financial sectors.

Financial environment and economic growth in selected Asian countries	Fase M., & Abma, R. (2003)	To examine the empirical relationship between financial development and economic growth in nine emerging economies in South-East Asia	Time series analysis Error correction model	Annual data of nine South-East Asian countries for a minimum of 25 years (Bangladesh, India, Malaysia, Pakistan, Philippines, Singapore, South Korea, Sri Lanka, Thailand)	GDP growth	Financial development measured as balance sheet totals of the banking sector, assuming that these reflect approximately the level of financial intermediation.	Financial development matters for economic growth, and that causality runs from financial structure to economic development. This result indicates that in developing countries a policy of financial reform is likely to improve economic growth.
Financial intermediaries, markets and growth	Fecht, F. et al. (2004)	To study whether the financial system influences growth in the long term	A general equilibrium model in which financial intermediaries provide insurance to households against a liquidity shock Households can also invest directly on the financial market if they pay a cost. In equilibrium, the ability of intermediaries to share risk is constrained by the market.				The model predicts that bank-oriented economies should grow more slowly than more market-oriented economies, which is consistent with some recent empirical evidence. It is shown that the mix of intermediaries and market that maximizes welfare under a given level of financial development depends on economic fundamentals. It is also shown that the optimal mix for two structurally very similar economies can be very different.
Financial development and economic growth: Evidence from panel unit root and cointegration tests	Christopoulos, D., & Tsionas, E. (2004)	To investigate the long-term relationship between financial depth and economic growth, trying to utilize the data in the most efficient manner	Panel unit root tests and panel cointegration analysis Cointegration tests and dynamic panel data estimation for a panel-based vector error correction model Long-term relationship is estimated using modified OLS, method that deals with the endogeneity of regressors	Data for 10 less developed countries (LDCs) Period: 1970-2000 (Colombia, Paraguay, Peru, Mexico, Ecuador, Honduras, Kenya, Thailand, Dominican Republic, and Jamaica)	Level of real output expressed as an index number (1995=100)	Financial depth measured as the ratio of total bank deposits liabilities to nominal GDP Share of investment expressed as the gross fixed capital formation to nominal GDP Inflation rate measured as the consumer price index (All data has as source IFS)	The use of panel unit root tests and panel cointegration analysis conclude that there is fairly strong evidence in favor of the hypothesis that long-term causality runs from financial development to growth, that the relationship is significant, and that there is no evidence of bi-directional causality. Time series evidence is also supportive of the idea that there exists a unique cointegrating vector between growth, financial development, and ancillary variables (investment share and inflation). Empirical evidence also suggests that there is no short-term causality between financial deepening and output, so the effect is necessarily long-term in nature. The important policy implication is that policies aiming at improving financial markets will have a delayed effect on growth, but this effect is significant.

Finance and the sources of growth at various stages of economic development	Rioja, F., & Valev, N. (2004)	To study the effects of financial development on the sources of growth in different groups of countries	GMM dynamic panel techniques	Panel data from 74 countries	Rate of growth of real per capita GDP Capital growth as the rate of growth of per capita physical capital stock Productivity growth as the rate of growth of the residual.	Private credit Commercial vs. central bank Liquid liabilities Initial income per capita Government size Openness to trade Inflation Average years of secondary schooling Black market premium	In low-income countries, finance seems to affect economic growth predominantly by means of capital accumulation. In contrast, in middle and especially high-income economies, financial development enhances productivity growth. It also contributes to physical capital growth, although the effect is somewhat smaller than in the low-income group. The strongest contribution of financial development does not occur until a country has reached a certain income level, roughly in the range that defines our middle income group. Until then most of the effect occurs through capital accumulation.
Financial development and growth in the short and long run	Fisman, R. & Love, I. (2004)	To analyze the relationship between financial development and inter-industry resource allocation in the short and long run.		Data of 37 industries in 42 countries over the period 1980-1990 Same dataset as Rajan & Zingales (1998)	Ral growth in valued added estimated for each industry		In the short run, financial development will facilitate the reallocation of resources to any industry with high growth potential. In the long run, the implications of financial development for the types of sectors that come to dominate economic activity are emphasized. So countries with high financial development specialize in industries with an inherent reliance on external finance.
Financial development and economic growth in Sub-Saharan African countries: Evidence from time series analysis	Ghirmay, T. (2004)	To explore empirically the causal link between the level of financial development and economic growth	Vector auto regression framework Maximum likelihood approach of Johansen, Dickey-Fuller, and Phillips Perron tests	Annual time series data of 13 Sub-Saharan African countries for at least 30 years before 2001 (Source: IFS)	Increase in real GDP	Level of credit to the private sector by the financial intermediaries	For almost all the countries; financial development and economic growth were cointegrated over the sample period, suggesting that in these countries, the two variables cannot drift apart in the long term and thus may not be considered independent from each other. The VECMs analysis yielded evidence of financial development causing economic growth in eight countries, economic growth causing financial development in nine countries, and bi-directional causal relationship in six countries.
The causality issue in the finance and growth nexus: Empirical evidence from Middle East and North African countries	Bouilila, G., & Trabelsi, M. (2004)	To explore the causality issue between financial development and economic growth in the Middle East and North Africa region	Cointegration techniques Granger causality tests	Annual data of a sample covering some MENA countries in different periods ranging from 1960 to 2002	The level of real GDP per capita expressed in national currencies	Ratio of M3 to GDP (M3Y) Ratio of credit allocated to the private sector Ratio of financial savings to GDP where financial savings are measured by the difference between M3 and M1 All the variables are expressed in national currencies and the sources are WBI, IFS, and the statistics of the Central Bank of Tunisia (for Tunisian data)	No support to the hypothesis that causality runs from the real to the financial sector. Little support to the view that finance is a leading sector in the determination of long-term growth. These findings might be associated with four features: (1) the strict control of the financial sector in these countries for long periods; (2) the delay in the implementation of financial reforms; (3) the persisting issues in reform implementation (non-performing loans in particular); and (4) the high information and transaction costs that prevent resource promotion and financial deepening even in the face of financial reform.

Financial development and economic growth in Southern Africa	Aziakpono, M. (2005)	To examine whether domestic financial institutions will become irrelevant in promoting economic growth, using the experience of the Southern African Customs Union and the (Rand) Common Monetary Area	Panel data analysis	Quarterly data from Q1 1980 to Q1 2000	Natural log of real GDP and growth in real GDP	Ratio of private credit to nominal GDP Ratio of liquid liabilities of commercial banks to nominal GDP Inflation Size of government Openness to trade Exchange rate variable	Domestic financial intermediation is still relevant in financially integrated markets. However, for the smaller countries of the SACU with less developed financial institutions, to derive the optimal gains from financial intermediation, they would need to take steps to strengthen their weak financial system and resolve the institutional and structural problems in their economies.
Deregulation, financial deepening and economic growth: The case of Latin America	Nazmi, N. (2005)	To examine the impact of banking deregulation and financial deepening on capital accumulation and growth	General equilibrium model with panel data on five countries (Argentina, Brazil, Chile, Colombia, and Mexico) GMM dynamic panel estimation	Annual data of five Latin American countries for a period of four decades	Investment GDP ratio	CREDIT: Ratio of deposit banks' credit to total credit (deposit banks' credit plus domestic assets of the central bank) LLY: Ratio of liquid liabilities (currency and demand deposits and other interest-bearing liabilities of financial intermediaries) to the GDP CREDIT: Ratio of bank claims on the private sector relative to the GDP Index of financial development constructed by averaging the BANK, LLY, and CREDIT variables	Statistical evidence from pooled time series, cross-country data shows that in Latin America financial development and investment were highly correlated during the period 1960–1995. The econometric evidence using panel data on five countries over four decades suggests that financial development has played a positive and significant role in fostering investment and economic growth in Latin America.
Financial development and economic growth in the Middle East	Al-Awad, M., & Harb, N. (2005)	To investigate the linkages between financial development and economic growth	Panel and time series cointegration (Johansen's cointegration, Granger causality, and variance decompositions)	Annual panel data of a sample of 10 Middle East countries over the period 1969-2000	Real GDP (calculated using the GDP deflator)	Real government spending Real M1 (Both indicators are calculated using GDP deflator) Ratio of private credit to the monetary base Credit to the private sector (All the indicators are expressed in natural logarithms excepting the ratio)	In the long term, financial development and economic growth may be related to some level as suggested by the panel cointegration tests. In the short term, causality effects run from economic growth to financial development. Time series analysis shows a strong relationship between financial development and real economic growth in the region but it fails to clearly establish the direction of causation. The results may be explained by the high degree of financial repression and the weak financial sector in the region, which is unable to support sustainable economic development.
Financial intermediation and economic growth: Evidence from Western Africa	Atindeou, R. et al. (2005)	To present empirical evidence on the relationship between financial intermediation and economic growth for West African countries	Time series analysis (Causality tests)	Available annual data on 12 West African countries for the period	Real GDP per inhabitant, computed using constant domestic currency prices	Domestic credits to the economy (total amount of credits allowed by financial institutions to all sectors, with the exception of credit to the central government, divided by GDP). Liquid liability (ratio of liquid commitments of the financial system to GDP) Liquid reserves (RES) is used as a proxy for the level of financial intermediation development. It is defined as the ratio of bank liquid reserves to bank assets.	The tests of causality confirms the link between financial intermediation and economic growth in some ECOWAS countries. In three countries, there is no significant causal relationship between economic growth and all financial proxies used. In the eight other countries, a variable one-way relationship can be seen, depending on the country and the variable used. A striking result is the failure of credit to explain economic growth. Given the importance of the informal sector in West African economies, it would be interesting to analyze the combined impact of formal and informal finance on economic growth, and vice versa. The non-availability of reliable data on the informal sector restricts such analysis.

Financial intermediation and growth: Some robustness results	McCaig, B., & Stengos, T. (2005)	To examine the relationship between financial intermediary development and economic growth using different instruments	Panel data analysis	Annual data of 71 countries with data averaged over the period 1960-1995 (LLB dataset)	Growth rate of real domestic product (GDP) per capita	Same conditioning information sets used by LLB - Simple conditioning information set - Policy conditioning information set - Full conditioning information set	GMM regressions of economic growth on indicators of financial intermediary development using the above mentioned instruments confirm the results found in an earlier study by LLB for a strong positive effect on growth when financial intermediation is measured by liquid liabilities and private credit as ratios to GDP. The results of the link between finance and growth are considerably weaker when financial intermediation is measured as the ratio of Commercial to Central Bank assets, something that may indicate that the latter variable is not a very good proxy for financial development.
Importance of financial sectors for growth in accession countries	Fink, G. et al. (2006)	To investigate the relationship between financial development and economic growth in nine EU accession and new EU member countries	Panel data analysis	Data for nine transition countries over 1996-2000	Real output growth per capita	Total financial intermediation/GDP Private credit/GDP Volume of loans of deposit/GDP Money banks and monetary authorities to all residents/GDP Real capital stock growth Labor participation Educational attainment	Overall financial sector development, as well as two single segments – domestic credit and bond markets – stimulates economic growth in the country sample. On the other hand, private credit and stock market capitalization are found to have no significant influence on growth.
Decomposing the effects of financial liberalization: Crises vs. growth	Ranciere, R. et al. (2006)	To present new empirical decomposition of the effects of financial liberalization on economic growth and on incidence of crises	The empirical specification combines a growth model and a crisis model Treatment effects model Panel data analysis	Internal data for 60 countries over the period 1980-1992 averaging data every 5 non-overlapping years.	Real per capita GDP growth Twin Crisis index	Financial liberalization dummy (index) Financial crises dummy as an endogenous variable (index). Initial per capita GDP Population growth Government size Inflation Openness to trade Real effective exchange rate	Financial liberalization leads to faster average long-term growth, even though it also leads to occasional crises. So, over the long term, the pro-growth effects of greater financial deepening and more investment by far outweigh the detrimental growth effects of financial fragility and a greater incidence of crises.
Is financial development really beneficial for Latin American countries?	Blanco, L. (2007)	To analyze the impact of financial development in economic growth (productivity and capital growth), income inequality, and education in Latin America	Dynamic panel data analysis	Annual observations from a sample of 12 Latin American countries from 1971 to 1998	Growth of GDP per capita	Private credit as a share of GDP Bank deposits as a share of GDP Initial level of GDP per capita Investment as a share of GDP Government spending as a share of GDP Inflation Terms of trade as a percentage of GDP (measure of openness)	Financial development has no significant effect on GDP per capita growth. In addition, results show that financial development has a positive effect on income inequality and on the percentage of the population that completes secondary education. Therefore, policies related to the development of the financial sector in Latin American countries should not be considered as a top priority.
An empirical reassessment of the relationship between finance and growth	Favara, G. (2007)	To re-examine the empirical relationship between financial development and economic growth	Cross-sectional data analysis and panel data techniques	Unbalanced panel of roughly 87 countries observed from 1960 to 1998	Log difference of GDP Growth of real GDP per capita	Level of liquid liabilities of the banking system Amount of credit issued to the private sector by banks and other financial institutions Initial levels of real per capita GDP Average years of attainment in secondary and higher education Government consumption to GDP Level of inflation rate Ratio of exports plus imports over GDP	Financial development and economic growth are correlated, but financial development does not cause economic growth. Second, there is evidence that this relationship is quite heterogeneous across countries. Using a procedure appropriately designed to estimate long-term relationships in a panel with heterogeneous slope coefficients, there is no clear indication that finance spurs economic growth.

What is happening to the impact of financial deepening on economic growth?	Rousseau, P., & Wachtel, P. (2007)	To re-evaluate the relationship between finance and growth with recent data Previous study covered 1960-89	Cross-sectional and panel analysis	International data for 84 countries for the period 1960-2003 5-year averaged data	Growth rate of real per capita GDP	Liquid liabilities (M3)/GDP M3 less narrow money (M1)/GDP Credit allocated to the private sector/GDP Government consumption/GDP Initial real per capita GDP Initial secondary school enrollment rate Ratio of trade (i.e. imports plus exports) to GDP	The impact of financial deepening on growth is not as strong with more recent data as it appeared to be in studies with data for the period from 1960 to 1989. In fact, the effect of financial depth on growth disappears.
Does financial development precede growth? Robinson and Lucas might be right	Zang, H., & Kim, Y.C. (2007)	To study whether there is any causal link between financial development indicators and economic growth	Panel data analysis	International data about 74 countries over the period 1961-1995		Ratio of liquid liabilities to GDP Ratio of deposit money bank domestic assets to deposit money Banks' domestic assets plus central bank domestic assets Credit issued to private enterprises divided by GDP Government expenditure/GDP	Substantial evidence that economic growth precedes subsequent financial development. Although results do not quite imply that the role of financial development in the development process is not important, the bottom line is that a more balanced approach to studying the relationship between growth and finance needs to be adopted
Are financial development and corruption control substitutes in promoting growth?	Ahlin C., & Pang, J. (2008)	To evaluate the role of low corruption and financial depth on the undertaking of productive projects, acting as substitutes in doing so	Dynamic panel data analysis	International data on a sample of 48 countries for the period 1960-2000 Decade average data	Average annual real GDP per capita growth	Total credit issued to private enterprises by deposit money banks and other financial institutions/GDP Liquid liabilities/GDP Deposit money bank assets/GDP Government expenditure/GDP ICRG corruption indicator	Financial development and low corruption are substitutes. In other words, the growth impact of reducing corruption is higher when the financial system is less developed. Conversely, the growth impact of improving the financial system is higher when corruption is high.
Finance and development : Is Schumpeter's analysis still relevant? 2008	Bertocco, G. (2008)	To re-evaluate the importance of Schumpeter's contribution analyzing recent works on the finance-growth nexus (i.e. Rajan and Zingales)	There is no original empirical work There is a depth evaluation of the theoretical and empirical model used by Rajan & Zingales (2003)	Evaluation of the work of Rajan & Zingales (2003) about the nexus between finance and growth	There is no original empirical work by the authors	There is no original empirical work by the authors	Rajan & Zingales (2003) do highlight important elements of Schumpeter's theory, but they do not take the implications thereof into account. Furthermore, they neglect certain fundamental aspects of the Schumpeterian analysis that are closely connected with the parts that they consider. This renders their work incomplete and prevents their analysis from achieving the coherence of Schumpeter's theory.
Financial development and economic growth: A panel approach	Dawson, P. (2008)	To examine the finance-growth nexus for a sample of less developed countries	Panel cointegration methods	Data for 58 less developed countries (LDCs) including low, lower middle, and upper middle-income countries Period: 1960-2002	GDP and investment as proxy of gross capital formation (in market prices in constant local currencies)	Liquid liabilities measured by ratio M3/GDP	Results show that in LDCs, there is a positive relationship between financial development and economic growth. The financial development elasticity of gross domestic product is 0.46, and this varies little between broad income groups.
Non-linear growth effects of financial development : Does financial integration matter?	Brezigar–Masten, A. et al. (2008)	To analyze the non-linear effects of financial development and international financial integration on growth in Europe	Dynamic panel data analysis	31 European countries, including four East Europe countries over 1995-2004	Real GDP per capita growth	Share of market capitalization and domestic credit provided by the banking sector in GDP Domestic credit and share of GDP Educational attainment Institutional factors (protection of property rights, administrative barriers, etc.	Transition economies benefit more from the development of domestic financial markets than EU-15 economies.

Finance and economic growth: The empirical relationship revisited	Lee, K. & Islam, R. (2008)	To re-examine empirically the relationships between finance and growth	Time series analyses (Co-integration and causality tests) Cross-country and dynamic panel data analyses	Data for 100 countries over the period 1960-2002	Per capita GDP growth	M2 to GDP M3 to GDP Total private credit to GDP Initial level of GDP Initial educational attainment Trade openness Government consumption Inflation	Serious heterogeneity in the nexus of finance and growth across countries. In the cross-country analysis, strong evidence that financial development spurs growth, but in the panel data analysis the results of the nexus are not significant.
Regional evidence on financial development, finance term structure and growth	Vaona, A. (2008)	To offer new perspectives on the long-running debate about finance-growth, by analyzing the effect of financial development on growth by using a regional dataset	Cross-sectional and panel data	Cross and panel data of 94 and 73 Italian provinces	Per capita GDP growth Growth of the capital stock per head or productivity growth	Ratio of total short-term credit over value added Ratio of long-term credit over value added Sum of exports and imports over value added Number of students enrolled in the secondary school over local resident population Value of finished public infrastructures over value added Number of crimes per head Level of provincial value added per head	Cross-sectional and panel evidence shows that finance leads growth and that the finance-growth nexus is robust to spatial unobserved heterogeneity. Spatial correlation in the residuals is rejected by the data. Economic growth appears to be favored by credit to private firms and more by short-term credit than by long-term credit.
Financial development and economic growth: Literature survey and empirical evidence from Sub-Saharan African countries	Acaravci, S. K. et al. (2009)	To review the literature on the finance-growth nexus and investigate the causality between these two variables in Sub-Saharan Africa	Panel co-integration and GMM estimation for causality	24 Sub-Saharan African countries for the period 1975-2005	Real GDP per capita	Bank credit (BC) is defined as the domestic credit provided by the banking sector (percentage of GDP) Private sector credit (PC) equals the domestic credit to the private sector (percentage of GDP); including non-bank credit to the private sector Liquid liabilities of the financial system (LL) are broad money (M3) (percentage of GDP)	A bi-directional causal relationship between the growth of real GDP per capita and the domestic credit provided by the banking sector was found for the panels of 24 sub-Saharan African countries. The findings imply that African countries can accelerate their economic growth by improving their financial systems and vice versa.
Who gets the credit? And does it matter?	Beck, T. et al. (2009)	To determine the effects of decomposing bank lending (enterprises and households) on real sector outcomes	Cross-country techniques	International dataset of 45 countries (developed and developing) decomposing bank lending into enterprises and households	GDP per capita growth Changes in income inequality Excess consumption sensitivity to output variations	Enterprise credit to GDP Household credit to GDP Initial GDP per capita Secondary enrollment Government consumption Trade Inflation Legal origin dummies Catholic, Protestant and Muslim population. Interest rate spread Saving as percentage of GNI Government transfers	Enterprise credit raises economic growth, whereas household credit has no effect. Enterprise credit reduces income inequality, whereas household credit has no effect. Household credit is negatively associated with excess consumption sensitivity while there is no relationship between enterprise credit and excess consumption sensitivity.
Financial development and economic growth: Evidence from ten new EU members	Caporale, G. et al. (2009)	To review the main features of the banking and financial sector in 10 new EU members and to examine the link between finance and growth	Dynamic panel data analysis	Data on 10 new EU member countries over the period 1994-2007	Real per capita GDP growth	Ratio of credit to the private sector to GDP Stock market capitalization to GDP ratio Liquid liabilities to GDP ratio Interest rate margin Lagged GDP per capita Average education Political and stability indicators Trade openness Inflation Government consumption	Stock and credit markets are still underdeveloped in these economies, and their contribution to economic growth is limited due to a lack of financial depth. By contrast, a more efficient banking sector was found to have accelerated growth. Furthermore, Granger causality tests indicate that causality runs from financial development to economic growth, but not in the opposite direction.

Puzzles in financial development and economic growth	Ghimire, B., & Giorgioni, G. (2009)	To contribute to the empirical literature on the impact of financial development upon economic growth	Panel data analysis, including panel unit root tests	Data for a sample of 121 countries that includes 28 LDCs for the period 1970-2006	Growth of GDP per capita	Various alternative bank and stock market variables (private credit, capitalization and value traded) Initial GDP per capita Gross enrollment rate secondary General government consumption to GDP Gross capital formation to GDP Inflation as change of CPI Index Import and export to GDP Black market premium	Evidence of a negative effect of private credit upon economic growth in the short term (annual data). However, unlike previous contributions, no evidence of a strong positive relationship between private credit and economic growth in the long term. The impact of stock markets is highly dependent on the variables chosen to explain stock market development, the method of estimation, and the possible role of self-selection bias.
A reevaluation of the impact of financial development on economic growth and its sources by regions	Dabos, M., & Williams, T. (2009)	To evaluate the impact of financial development on growth, introducing a new methodology	Dynamic panel data analysis	Data for 78 (developed and developing) countries through 35 years over the period 1961-1995 5-year average data, resulting in seven time observations	Real GDP per capita growth Growth of the real per capita stock of physical capital and productivity growth	Private Credit /GDP Liquid Liabilities/GDP Initial real GDP per capita Public consumption or public expenditure divided by GDP Trade is the commercial openness divided by GDP Inflation Black market premium Exchange rate Average years of secondary school of the country's total population	Financial development contributes to increasing economic growth, especially in areas like Africa and Latin America, with important positive economic effects and statistically different from zero. The transmission channel from financial development to economic growth is more likely to be through productivity growth than through capital growth as Schumpeter suggested.
Financial development and economic growth: A panel data analysis of emerging countries	Kiran, B. et al. (2009)	To investigate the long-term relationship between financial development and economic growth	Panel data unit root tests and panel cointegration techniques	Data for 10 emerging countries over the period 1968-2007 (Mexico and Peru are part of the sample)	GDP per capita	Liquid liabilities of the financial system to GDP (M3/GDP) Bank credit/GDP ratio Private sector credit/GDP ratio Gross fixed capital General government final consumption expenditure as share of GDP Volume of trade as share of GDP	There is a long-term relationship between economic growth and the measures of financial development. Additionally, the results support the hypothesis that financial development has a positive and statistically significant effect on economic growth.
Financial development and economic growth - A comparative analysis	Yay, G. & Oktayer, A. (2009)	To investigate the link between financial depth and economic growth for developed and developing countries comparatively, considering stock markets and banks	Dynamic panel data analysis (Generalized method of moments technique)	Panel dataset of 21 developing and 16 developed economies for the period 1975-2006	Growth rate of real GDP per capita	Bank credit to GDP Turnover Ratio GDP Initial real GDP per capita Average years of schooling Black market exchange premium Trade openness Inflation rate Government expenditures	While the results of the econometric evidence relevant to developing economies indicate that both stock markets and banks positively influence economic growth, the results of econometric evidence relevant to developed economies indicate that only stock markets positively influence economic growth.
Financial development and economic growth – A comparative study between 15 European states	Antonios, A. (2010)	To investigate the relationship between financial development and economic growth for 15 European Union member-states	Simultaneous system equations model (Two-stage least squared method)	Data for 15 European Union member-states for the period 1965-2007	GDP General stock market index Domestic bank credits to private sector	Lagged GDP Lagged general stock market index Lagged domestic bank credits to private sector Interest rate Consumer price index Industrial production index	The results of this paper indicated that there is a positive relationship between financial development and economic growth when taking into account the negative effect of inflation rate and interest rates.

Financial development and economic growth in Latin America: Is Schumpeter right?	Bittencourt, M. (2010)	To conduct a case study to better understand the effect of finance on growth	Panel time series techniques	Annual data (not period averaged) for the period 1980-2007 Four Latin American countries	Growth rate of real GDP per capita	Liquid liabilities to GDP (M2/GDP) Government's share in the real GDP Ratio of exports and imports to real GDP Ratio of investment to real GDP Years of schooling Interaction with urbanization Inflation Political indexes (democracy, constraints on the executive, and political competition)	The Schumpeterian prediction that finance leads growth seems to hold even in an extreme political and economic environment like the one seen in Latin America in the 1980s and 1990s.
Financial integration and financial development in transition economies: What happens during financial crises?	Brezigar–Masten, A. et al. (2010)	To evaluate the role of financial integration in determining the impact of financial development on growth, distinguishing “normal times” from periods of financial crises	Dynamic panel data (GMM estimators)	Aggregate-level annual data for 31 European countries (EU27, Croatia, Ukraine, Russian Federation, Iceland, and Norway) for 1996-2004	Real GDP per capita growth	Market capitalization and domestic credit provided by the banking sector as share of GDP Stock of total foreign assets and liabilities as a percentage of GDP Lagged GDP per capita growth Inflation Educational attainment Institutional factors (protection of property rights, administrative barriers, etc.)	There is a significant positive effect on growth exerted by financial development and financial integration. Furthermore, a higher degree of financial openness tends to reduce the contractionary effect of financial crises by cushioning the effect on the domestic supply of credit. So the high reliance on international capital flows by transition countries does not necessarily increase their financial fragility. Therefore, financial protectionism is a self-defeating policy, at least for transition countries.
Financial development and economic growth in the MENA countries	Goaied, M. (2010)	To assess empirically the relationship between the financial development and growth in some countries in the MENA region	Dynamic panel model (GMM estimator)	Annual data for 16 MENA countries over the period 1993 - 2006	GDP per capita growth	Liquid liabilities (M3) to GDP Value of loans made by deposit money banks and non-bank institutions to the private sector/GDP Initial income per capita (constant 2000 USD) Ratio of exports plus imports to GDP Inflation rate Ratio of government consumption to GDP	No significant relationship between banking and growth. Also, some specifications that the banks indicator is significantly negatively associated with growth were found. The relationship between financial development and growth is quite heterogeneous across MENA countries, while the relation is negative for petroleum exporting MENA countries and positive but not significant in MENA countries without oil.
Too much finance?	Arcand, J. et al. (2011)	To examine whether there is a threshold above which financial development no longer has a positive effect on economic growth	Theoretical partial equilibrium model to analyze the relationship between finance & growth Cross-sectional and panel econometric analyses (GMM)	International cross-country data covering the period 1976-2005	Growth rate of real GDP per capita	Total credit to the private sector Turnover ratio in the stock market Initial GDP per capita (convergence) Years of schooling (human K accumulation) Trade openness Inflation Ratio of government expenditures to GDP	It is probable that finance starts having a negative effect on output growth when credit to the private sector reaches 110 percent of GDP. The size of the financial sector was a significant amplifying factor in the global crisis that followed the collapse of Lehman Brothers in September 2008.
Finance and growth: Schumpeter might be wrong in our era. New evidence from meta-analysis	Asongu, S. (2011)	To bridge the gap between Schumpeterian authors and sympathizers of Andersen and Tarp (2003)	20 comparison criteria to robustly account for which factors have influenced the finance-growth nexus over the past decades	20 studies used in the meta-study were obtained after an extensive literature search from April to June 2011, and from 187 studies, 20 were selected	t-statistics for either financial depth or financial activity	20 different types of dummies to account for differences in studies that are meta independent and could influence the outcome of the finance-growth nexus	Support for Andersen and Tarp (2003) in concluding that, contrary to Schumpeterian authors, the positive link between finance and growth has not been sufficiently sustained by recent empirical works. The frequency of financial crises that inhibit the finance-led-growth nexus is more preponderant in our era than it was in the days of Schumpeter.

Finance and growth: When credit helps, and when it hinders	Bezemer, D. J. (2011)	To present an alternative approach in the credit nature of money, making the distinction between credit flows that grow the economy of goods and services, and credit that inflates markets for financial assets and property.	Descriptive statistics Analysis of results of other recent studies such as Arcand et al. (2011)	Data on financial aspects for some developed countries such as the US, UK, and others, mainly referring to the recent crisis years	GDP growth	Credit to GDP ratio (decomposed in two components) Control variable group (without specifying which are the variables considered in the study)	Excessive growth of financial-sector credit may hinder rather than help economic growth, even as it fuels booms in wealth and consumption. Crisis has exposed gaps in economists' understanding of this dual potential. Current macroeconomic thinking does not distinguish between credit flows that help and those that hinder the economy. This paper explains why credit and debt are absent from today's macroeconomics, and the first type of credit flows.
The changing face of financial development	Demetriades, P., & Rousseau, P. (2011)	To provide new evidence from a large number of countries which suggests that the quality of financial development is now more important for growth than the quantity	Cross-sectional and panel data analyses	Data for 84 countries over the period 1975 to 2004	Growth rate of real per capita GDP	Liquid liabilities less M1 (% of GDP) Weakness of bank supervision Ease of bank entry Ease of credit controls Privatization Securities markets Interest rate liberalization Capital account openness Initial real per capita GDP Initial secondary school enrollment rate Ratio of trade to GDP Ratio of government final consumption to GDP	New evidence from a large number of countries suggests that the quality of financial development is now more important for growth than the quantity. The results show that the interplay between a new measure of banking supervision (which captures aspects of both regulation and supervision) and various types of financial reforms has become a more vital channel for economic growth than overall financial development.
Excess financial development and economic growth	Ductor, L., & Grechyna, D. (2011)	To investigate the possible negative influence of financial development on economic growth	Panel data analysis	33 OECD economies over the period 1970-2005	Growth rate of real per capita GDP	Difference between financial and industrial output growth Difference between private credit divided by GDP and industry output divided by GDP Difference between the financial and industrial unit labor cost growth Difference between financial and industrial unit labor productivity growth Initial level of real GDP per capita Trade openness and other control variables	It is necessary to spur economic growth the equilibrated growth of both the real and the financial sectors. If financial development exceeds the development of the productive industries by 4.5% (measured in terms of growth rates of the two sectors' output), there is a threat of reaching the productive capacity limit of the economy, with consequent financial crisis.
The finance-growth nexus in Sub-Saharan Africa: Panel cointegration and causality tests	Fowowe, B. (2011)	To examine the causal relationship between financial development and economic growth for the case of Sub-Saharan Africa	Data on 17 countries of Sub-Saharan Africa over the period 1975-2005	Panel co-integration and causality tests	Real per capita income	Ratio of credit provided by banks to the private sector to GDP Ratio of bank deposit liabilities to GDP	Homogenous bi-directional causality between financial development and economic growth. This result is robust to alternative measures of financial development and implies that for these Sub-Saharan African countries, both the real and financial sectors are complementary to each other and their simultaneous development should be encouraged.
Financial development and economic growth: New evidence from panel data	Hassan, K. et al. (2011)	To provide evidence on the role of financial development in economic growth in low and middle-income countries classified by geographic regions	Panel regressions and variance decompositions	Data for six geographic regions and high-income OECD and non-OECD countries classified according to the World Bank for the period 1980-2007	Annual GDP per capita and its growth rate	Domestic credit provided by the banking sector to GDP Domestic credit provided by the banking sector to GDP Liquid liabilities (M3) to GDP Gross domestic savings Initial GDP per capita Inflation Trade openness Government expenses	Positive relationship between financial development and economic growth in developing countries. Short-term multivariate analysis provides mixed results: a two-way causality relationship between finance and growth for most regions and one-way causality from growth to finance for the two poorest regions. It seems that a well-functioning financial system is a necessary but not sufficient condition for growth in developing countries.

The causality between financial development and economic growth: Panel data cointegration and GMM system approaches	Rachdi, H., & Mbarek, H. B. (2011)	To empirically investigate the direction of causality between finance and growth	Panel data co-integration and GMM system approaches	Sample of 10 countries, six from the OECD region and four from the MENA region during 1990-2006	Logarithm of real GDP per capita	Private credit by deposit money banks and other financial institutions to GDP Liquid liabilities (LL): Ratio of liquid liabilities to GDP Average annual CPI. P denotes annual change in consumer price index (CPI) Log of the ratio of government consumption to GDP	The panel data co-integration analysis confirms a long-term relationship between financial development and economic growth for the OECD and the MENA countries. The GMM system approach shows that finance and real GDP per capita are positively and strongly linked. The error correction model approach shows that causality is bi-directional for the OECD countries and unidirectional for the MENA countries, i.e. economic growth stimulates financial development.
The finance-growth thesis: A sceptical assessment	Andersen, T. et al. (2012)	To evaluate the role of financial development in growth in developing countries	Panel data analysis	International sample of developed and developing countries of different regions over the period 1975-2006 A separate estimation is made for Sub-Saharan African countries	Annual percentage growth rate of GDP per capita	Real interest rate (%) Money and quasi money (M2) (% GDP) Liquid reserves to assets ratio (%) Domestic credit to private sector (% GDP) Liquid liabilities (M3) (% GDP) Financial reform dummy Gross capital formation (% GDP) Gross saving (% GDP) Consumer price inflation (%) Foreign direct investment (% GDP) Interest rate spread (%) Gross domestic saving (% GDP) Government final consumption (% GDP) Private consumption (% growth)	Financial liberalization is widely seen as key to promoting financial development and therefore growth. However, this thesis seems to rest on weak theoretical and empirical foundations. There is some evidence of a positive association running from financial liberalization to various final outcome indicators including economic growth; however, this is unlikely to be causal and, even if it were, the underlying mechanism must involve something other than financial deepening. As such, the stylized claims of the finance-growth literature stand challenged.
The finance and growth nexus re-examined: Do all countries benefit equally?	Barajas, A. et al. (2012)	To investigate whether the impact of finance on growth differs across regions and types of economies	Cross-sectional and dynamic panel analysis	130 countries for the period 1975-2005 Non-overlapping 5-year averages of all variables	Growth rate GDP	Bank private credit/GDP Turnover (ratio of the value of total shares traded to average real market capitalization) Terms of trade in goods and services Public consumption expenditure Population Gross secondary school enrollment Ratio of foreign direct investment to GDP Initial level of GDP	The beneficial effect of financial deepening on economic growth displays heterogeneity; it seems smaller in oil exporting countries, in certain regions, such as the Middle East and North Africa (MENA), and in lower-income countries. These differences might be driven by regulatory/supervisory characteristics and related to differing performance in terms of financial access for a given level of depth.
Reassessing the impact of finance on growth	Cecchetti, S., & Kharroubi, E. (2012)	To investigate how financial development affects growth at both the country and the industry level	Panel data analysis	5-year non-overlapping averages for 50 advanced and emerging countries over 1980-2009 33 manufacturing industries in 15 advanced countries	Real GDP per worker Productivity of firms	The ratio of banking assets to GDP Total private credit to GDP Average R&D expenditure to value added. Initial relative labor productivity Working population Ratio of imports and exports to GDP Ratio of government consumption to GDP and CPI	Financial development is good only up to a point, after which it becomes a drag on growth. Regarding advanced economies, a fast-growing financial sector can be detrimental to aggregate productivity growth. Looking at industry-level data, we show that financial sector growth disproportionately harms industries that are either financially dependent or R&D-intensive.
Financial development and economic growth in Africa: Lessons and prospects	Oluitan, R. (2012)	To examine if financial institutions within Africa are well positioned to assist the continent out of poverty with their growth-prone capability	Dynamic panel data analysis	Data for about 31 African countries over the period 1970 - 2005	Real per capita GDP growth rate Real per capita fixed capital formation growth rate	Liquid liabilities (M3) to GDP Ratio of private sector credit to GDP Ratio of government spending to GDP Ratio of trade (exports plus imports) to GDP Inflation rate	The contribution of the financial sector through intermediation is important to growth. Despite the tiny contribution to the private sector, evidence from the study finds that private sector credit is important for growth; hence it fails to agree that there is no long-term relationship between private credit and growth.

Source: Author's own preparation based on literature survey

ANNEX 2.2: REVIEW OF EMPIRICAL EVIDENCE ON FINANCE & INEQUALITY (1998-2012)

Study	Author (s)	Main Goal	Econometric Techniques	Sample/Period	Dependent Variable/ Indicators	Independent Variables/Indicators	Main Findings
Explaining international and intertemporal variations in income inequality	Li, H. et al. (1998)	To explore if income inequality is relatively stable within countries and it varies significantly among countries To explain international and inter-temporal variations in income inequality	Data panel analysis OLS estimations	Unbalanced dataset with 5-year average data for 49 countries over the period 1974-1994 limited number of income inequality observations	Gini coefficient	Initial mean years of secondary schooling (1960 data) Civil liberty index Initial Gini coefficient for the distribution of land Financial development measured as M2/GDP	The results suggest that inequality is largely determined by factors that change only slowly within countries but are quite different across countries. The two channels identified in the recent literature – the political economy argument and the capital market imperfection channel – received strong support, with the latter appearing to have the greater influence.
Financial development and poverty reduction in developing countries	Jalilian, H. & Kirkpatrick, C. (2002)	To examine the contribution that financial development makes to poverty reduction in low income countries	Data panel analysis First difference models	Unbalanced panel data for a sample of 42 countries	Per capita income in the poorest segment of the population	A proxy of financial development Level of per capita income Income per capita growth rate Change in Gini coefficient Change in inflation Change in public expenditure Initial income Developing countries dummy	The results show that financial development does contribute to poverty reduction and therefore provides a firm basis on which to undertake a more focused, micro-empirical investigation of how specific financial sector policies and programs can be deployed as effective instruments for achieving poverty reduction in low- income countries.
Growth is good for the poor	Dollar, D. & Kraay, A. (2002)	To determine empirically if the poorest of society benefit from economic growth	Data panel analysis	285 observations covering 92 countries for which at least two spaced observations on mean income of the poor are available	Logarithm of per capita income of the poor	Logarithm of average income per capita Set of additional control variables including financial development	A variety of pro-growth macroeconomic policies, such as inflation, moderate size of government, sound financial development , respect for the rule of law, and openness to international trade, raise average incomes with little systematic effect on the distribution of income. Private property rights, stability, and openness contemporaneously create a good environment for poor households to increase their production and income. On the other hand, little evidence that formal democratic institutions or a large degree of government spending on social services affects incomes of the poor.
Finance and income inequality: Test of alternative theories	Clarke, G. et al. (2003)	To analyze whether financial intermediary development has an impact on income inequality and whether this impact depends on the level of financial intermediary development or the sectoral structure of the economy, as implied by alternative existing theories	Pair wise correlation Data panel analysis	Panel dataset of 91 (developed and developing) countries for the period 1960-1995 The data was averaged for seven non overlapping 5-year period	Gini coefficients compiled by Deininger & Squire (1996) and extended by Lundberg & Squire (2000)	- Credit to the private sector by financial intermediaries over GDP - Claims on the non-financial domestic sector by deposit money banks divided by GDP - Initial real per capita GDP - Inflation rate - Government consumption - Ethno-linguistic fractionalization - Property rights protection - Share of value added accounted for by services and industry in relation to GDP - Legal origin legal dummy variables	Evidence that inequality decreases as economies develop their financial intermediaries, consistent with the theoretical models in Galor and Zeira (1993) and Banerjee and Newman (1993). Consistent with the insight of Kuznets, the relation between the Gini coefficient and financial intermediary development appears to depend on the sectoral structure of the economy; a larger modern sector is associated with a smaller drop in the Gini coefficient for the same level of financial intermediary development. However, there is no evidence of an inverted U-shaped relationship between financial development and income inequality.

Pro-growth, pro-poor: Is there a tradeoff?	Lopez, H. (2004)	To provide an empirical evaluation of the impact of a series of pro-growth policies (among them financial development policies) on inequality and headcount poverty	Dynamic panel data analysis	Non-overlapping 5-year periods spanning the years 1960-2000, resulting in 134 cases and 41 countries	The log of per capita income and the log of the Gini coefficient considered in a dynamic structure	Output gap as proxy of cyclical reversion Rate of gross secondary enrollment as human K. proxy Ratio of private domestic credit supplied by private financial institutions to GDP Ratio of government consumption to GDP Infrastructure proxies Governance & institutional quality proxies Other control variables as trade openness, inflation rate, cyclical volatility, real exchange rate misalignment, banking crisis (number of years that a country undergoes a banking crisis in the period under analysis), and terms of trade changes	The findings suggest the likelihood of inequality convergence, and that the speed of convergence for inequality is faster than the speed of convergence for per capita income levels. On the growth-inequality links, he finds a Kuznets type of relationship by which inequality would increase with income levels up to about \$3,000 (1985 US dollars) and decrease thereafter, and find no significant evidence of inequality affecting growth. Admittedly, the point estimate for inequality comes close to being significant at the 10 percent level, suggesting that higher inequality would lead to lower growth. Improvements in education and infrastructure and lower inflation levels would lead to both growth and progressive distributional change. Financial development , trade openness, and cuts in the size of the government, all policies that would lead to faster growth, would be associated with increases in inequality. Financial crises would be associated with reductions in inequality.
Finance, inequality and poverty: cross-country evidence	Beck, T. et al. (2004)	To assess the relationship between financial development and changes in the distribution of income To assess the relationship between financial development and poverty alleviation (changes in income inequality and changes in poverty)	Cross-country analysis because the relationship between finance and poverty (inequality) is long term and the data on poverty and inequality are limited	Data on 52 developing and developed economies with data averaged over the period 1960 – 1999 Data on 58 developing countries with data over the period 1980-2000	Income growth of the poor Growth of Gini Two additional measures of poverty intensification - Growth of headcount - Growth of poverty gap	Private credit /GDP Schooling 1960, the log. of the average years of school attainment Inflation 1960, growth rate of the GDP deflator period 1960-1999 Trade openness, sum of exports and imports as a share of GDP Average real per capita GDP growth Instrumental variables for financial development (Legal origin, latitude of the capital city, religious composition, and ethnic fractionalization)	Financial development reduces income inequality by disproportionately boosting the incomes of the poor. Countries with better developed financial intermediaries experience faster declines in measures of both poverty and income inequality. The results are robust for other country characteristics and potential reserve causality.
Does financial development contribute to poverty reduction?	Jalilian, H., & Kirkpatrick, C. (2005)	To examine the contribution of financial development to poverty reduction in developing countries	Panel data analysis	Unbalanced dataset covering 42 countries (26 developing and 16 developed)	GDP per capita growth Gini coefficient Growth of income of the bottom quintile.	Lag of dependent variable Financial development (log of private credit-GDP ratio) Log of percentage of primary school enrollment Log of initial per capita income Trade regime (dummy) Change in inflation rate between two consecutive periods Change in trade share (change in (X+M)/GDP between two consecutive periods) Change in manufacturing share (change in manufacturing value added over GDP between two consecutive years) Interactive term (financial development indicator x dummy for developing countries)	Up to a threshold level of economic development, financial sector growth contributes to poverty reduction through the growth-enhancing effect. The impact of financial development on poverty reduction will be affected, however, by any change in income inequality resulting from financial development. The impact of finance on growth is most pronounced at lower income levels, so that poorer developing countries will gain most from the development of the financial sector. The analysis linking poverty to finance is indirect..In the absence of access to a suitable proxy to capture any direct effect that finance may have on growth, they have attempted to capture the poverty effects of financial development indirectly from its impact on growth. The results show that the impact is positive. In relation to the link between finance and inequality, results suggest that the link is quadratic (U-inverted curve).

Finance and income inequality: What do the data tell us?	Clarke, G. et al. (2006)	To examine the relationship between finance and income inequality	Cross-sectional analysis, using data average over the entire period 1960-1995, to capture the long-term relationship Panel analysis using 5-year panels, to examine the process of comovement between finance and inequality and therefore be a more appropriate setup in which to test the inverted U-shaped hypothesis	Data for 83 countries between 1960 and 1995	Gini coefficient (Natural log)	Real per capita GDP Private credit: claims on the private sector by financial institutions divided by GDP Bank assets: claims on domestic non-financial sector by deposit money banks divided by GDP Risk of expropriation: index indicating risk of expropriation through confiscation or forced nationalization Ethno-linguistic fractionalization: average value of five indices of ethno-linguistic fractionalization, with values ranging from 0 to 1 Government as share of GDP Inflation rate: log difference of Consumer Price Index Modern sector value added/GDP: value added of service and industrial sectors as share of GDP	The results provide some support for the inequality-narrowing hypothesis. A significant negative coefficient on the measures of financial intermediary development was found once endogeneity was controlled for, and hypothesis tests suggest that this is important. In contrast, the results decisively reject the inequality-widening hypothesis. Moreover, while the cross-sectional (long-term) data do not provide much support for the inverted U-shaped hypothesis, the short- and medium-term panel data do provide some weak support for the inverted U-shaped hypothesis. Overall, the results suggest that the growth-spurring effects of financial intermediary development are likely to be associated with positive effects on aggregate income distribution as well.
Finance, inequality and the poor	Beck, T. et al. (2007)	To assess the impact of financial development on changes in the distribution of income and changes in both relative and absolute poverty	Cross-section regression analysis and dynamic panel instrumental variables regressions	International data covering the period 1980-2005	(1) Gini coefficient (2) Income share of the poor (3) Percentage of the population living on less than \$1 per day	Private credit to GDP Control variables (as reflecting the initial conditions): GDP per capita growth and average years of school as measures of initial human capital, inflation, trade openness (X+M/GDP), population growth, and the ratio of the population below the age of 15 and above the age of 65 to the population between 15-65 years (Age dependency ratio)	Financial development disproportionately boosts incomes of the poorest quintile and reduces income inequality. About 40% of the long-term impact of financial development on the income growth of the poorest quintile is the result of reductions in income inequality, while 60% is due to the impact of financial development on aggregate economic growth. Financial development is associated with a drop in the fraction of the population living on less than \$1 a day, a result which holds when conditioning on average growth. Findings emphasize the importance of the financial system for the poor.
Is financial development really beneficial for Latin American countries?	Blanco, L. (2007)	To analyze the impact of financial development in economic growth (productivity and capital growth), income inequality, and education in Latin America	Dynamic panel data analysis	Annual observations from a sample of 12 Latin American countries from 1971 to 1998	Growth of GDP per capita Texas Inequality Index	Private credit as a share of GDP Bank deposits as a share of GDP Initial level of GDP per capita Investment as a share of GDP Government spending as a share of GDP Inflation Terms of trade as a percentage of GDP (measure of openness)	Financial development has no significant effect on GDP per capita growth. In addition, results show that financial development has a positive effect on income inequality and on the percentage of the population that completed secondary education. Therefore, policies related to the development of the financial sector in Latin American countries should not be considered as a top priority.

Financial deepening, property rights, and poverty: Evidence from Sub-Saharan Africa	Huang, Y., & Singh, R. J. (2009)	To evaluate the role of financial development on poverty and income inequality	Panel data analysis	Data on a sample of 37 countries in Sub-Saharan Africa for the period 1992-2006	Poverty gap Income of the poorest quintile Gini coefficient	Financial liberalization index Property rights index Information-sharing index Overall income per capita Growth of the consumer prices (inflation) General legal environment Sum of exports and imports as a share of GDP	Results suggest that financial deepening could narrow income inequality and reduce poverty, and that stronger property rights reinforce these effects. Interest rate and lending liberalization alone could, however, be detrimental to the poor if not accompanied by institutional reforms, in particular stronger property rights and wider access to creditor information.
Financial development and the distribution of income in Latin America and the Caribbean	Canavire-Bacarreza, G., & Rioja, F. (2009)	To study the effects of financial development on the whole distribution of income in LAC	Dynamic panel analysis	Data on 21 Latin American countries for the period 1960-2005	Average income of every quintile from the poorest Gini coefficient collected from UNIDO WIDER	Private credit Initial level of GDP per capita Average years of schooling Log inflation Trade openness	The income of the poorest quintile has not been affected by expansion in the financial system. However, there is evidence that financial development has had a disproportionately positive effect on the incomes of the second, third, and fourth quintiles. They also find some evidence for the Greenwood- Jovanovic (1991) hypothesis that this positive effect only begins after a country crosses a certain economic development threshold.
The effects of financial development on income inequality and poverty	Kappel, V. (2010)	To examine the effects of financial development on income inequality and poverty	Standard OLS and 2SLS cross-country regressions and random effects panel analysis	Data covering a sample of 78 developing and developed countries for the period 1960-2006	Gini coefficient (UNU-WIDER) and the percentage of the population living below the poverty line (WDI)	Private credit/GDP Market capitalization/GDP Total value traded/GDP Turnover ratio Joint finance measure Financial access Ethnic fractionalization Land Gini Government expenditure/GDP Inflation Secondary enrollment Average years of schooling Literacy rate Human Development Index	The results of both cross-country and panel data regressions suggest that inequality and poverty are reduced not only through enhanced loan markets, but also through more developed stock markets. She shows that ethnic diversity and the distribution of land are significant and robust determinants of both income inequality and poverty. Finally, she finds evidence that government spending leads to a reduction in income inequality in high-income countries. In low-income countries, however, we find no significant effect.
Availability of financial services and income inequality: The evidence from many countries	Mookerjee, R., & Kalipioni, P. (2010)	To empirically evaluate the impact of the availability of financial services on income inequality	Cross-sectional analysis	Data for 70 developing and developed countries for the period 2000–2005	Gini coefficient (UN-Wider dataset) Because the study uses cross-sectional analysis, the Gini coefficient data for each country was averaged for the period 2000-2005	Banks per 100,000 population Minimum amount to open checking and savings account Location to submit loan applications GDP per capita Trade openness Inflation Telephones per 1000 population	The results show that greater access to bank branches robustly reduces income inequality across countries. The study also documents that barriers to bank access significantly increase income inequality.

The impact of financial development on poverty in developing countries	Rosner, B. (2010)	To evaluate the role of financial development on poverty	Cross-sectional data analysis (OLS and IV instrumental estimations)	Data for 45 developing countries covering available data time frame of 1980 – 2006	Growth of Gini (annual growth rate of Gini coefficient) Growth of headcount (annual growth rate of the % of population living below the poverty line) Growth of poverty gap (annual growth rate of the difference between the poverty line and the mean income of those living below the poverty line)	Private Credit/GDP M3/GDP Deposits/GDP Inflation (annual growth rate of consumer price index) Growth of GDP (annual growth rate of GDP per capita)	Results show that financial development can help the poor in various ways. Specifically, the increasing of the availability of money and deposit opportunities, rather than private credit, reduces poverty. Second, financial development has the greatest impact on poverty for the least financially developed countries. Additionally, financial development does not promote income inequality. These results are robust to omitted variable and reverse causality biases.
Finance and inequality: Exploring pro-poor investment channels in Africa	Asongu, S. (2011)	To investigate how financial dynamics of depth, efficiency, activity, and size have affected income inequality through domestic, foreign, private, and public investment channels	Two-Stage-Least Squares (TSLs) with financial dynamics as instrumental variables	Data on 13 African countries over the period 1980-2002	Household income inequality data obtained from the University of Texas Inequality Project	Gross domestic investment/GDP Foreign direct investment/GDP Gross private investment/GDP Gross public investment/GDP (Imports + Exports)/GDP Government consumption/GDP Population growth Average annual GDP growth rate M2 and M3 Financial system deposits Bank credit on bank deposits Financial system credit on financial system deposits Private credit by deposit banks Private credit by deposit banks and other financial institutions Deposit bank assets on central bank assets plus deposit bank assets	For the case of foreign investment, financial development has an equalizing effect on income distribution through investment channels. This is broadly consistent with theoretical and empirical literature. The disequalizing effect of foreign investment also respects theoretical postulations with respect to the hypothesis of an inverted U-shaped relationship. As a policy implication, financial reforms that target poverty reduction at the early development stage in a country should focus on private, public, and domestic investments. However when a country is mature in development terms, then financial reforms favoring globalization through foreign direct investment will be pro-poor.
Financial development and income inequality: Evidence from African countries	Batuo, M. et al. (2011)	To present empirical evidence on how financial development is related to income distribution in African countries	Dynamic panel data analysis (GMM estimator)	Data covering 22 African countries for the period 1980 to 2004	Gini coefficient (Collected from diverse sources such as WIDER-WIID and Deininger and Squire, 1996)	Liquid liabilities to GDP Broad money (M2) to GDP Domestic private sector lending by banks as a share of GDP GDP per capita level Primary school enrollment rate Size of the modern sector Inflation	Income inequality decreases as economies develop their financial sector, which is consistent with the bulk of theoretical and empirical research. The results also confirm that educational attainment plays a significant role in making income distribution more equal. No evidence supporting the Greenwood-Jovanovic hypothesis of an inverted U-shaped relationship between financial sector development and inequality.

Financial development, growth, inequality and poverty: Evidence from the former Communist countries	Cojocaru, L. (2011)	To estimate the role played by financial development in economic growth, as well as the evolution of poverty and inequality	Dynamic panel data analysis (GMM system)	Data on the former Communist countries of Central and Eastern Europe and the Commonwealth of Independent States, since 1990	Growth rate of GDP per capita Gini	Various proxies for financial depth and efficiency Control variables such as human capital, population growth, trade openness, etc.	Increases in credit to the private sector and reductions in the interest rate spread are the factors with the most significant and robust beneficial effects on growth. After the fall of their Communist regimes these countries have embarked on a process of development and reform of their financial systems with a positive effect on economic growth. Using a fixed-effects framework, there is evidence that financial deepening may increase inequality and decrease the share of income of the poorest citizens. However, contingent on the controls, the relationship might, in fact, follow an inverted U. While financial development seems to have helped decrease absolute poverty, this effect is an indirect one, through economic growth.
Finance, growth, and inequality: Channels and outcomes	Sankar, D. et al. (2011)	To assess how financial development impacts income inequality	Generalized Method of Moments (GMM) estimations	Data covering 150 countries for the period 1960- 2006	Gini coefficient	Financial development indicators such as private credit to GDP Access to financial services indicators such as Geographic Branch Penetration, Demographic ATM Penetration, Geographic ATM Penetration, and Demographic ATM Penetration Education attainment (primary, secondary and tertiary) Labor (RWR_UNIDO & RWR_OWW) Real GDP growth Inflation Growth in trade openness	Financial development leads to a reduction in income inequality that is economically significant. A one standard deviation increase in the private credit to GDP for the median country-year observation would reduce the Gini coefficient by 10.0% (from 41.05 to 36.93). Also broadening access to financial services (increasing the geographic/demographic penetration of bank branches) may work faster in reducing income inequality than merely deepening the availability of credit.
A new perspective on financial development, inequality and growth	Koepl, T. et al. (2011)	To take a fresh look at the relationship between inequality and growth by endogenizing the degree of market incompleteness	Theoretical model	Non-empirical evidence	Non-empirical evidence	Much of the recent literature on inequality and growth shows that it is the combination of endowment inequality and market imperfections that leads to bad economic outcomes and creates a rationale for redistribution. In the model, the authors show that as long as it is possible to invest in better functioning markets, the optimal social arrangement calls for a combination of redistribution and institutional investment	Better functioning financial markets require resources but allow for a better equalization of marginal products across people. Investment in financial development complements redistribution to achieve optimal economic outcomes and over time leads to a reduction in inequality. The optimal redistribution scheme is more subtle than a simple mean-preserving contraction, since it is a requirement that all agents need to benefit from financial development and redistribution.
The effect of financial development on poverty and inequality in African countries	Fowowe, B., & Abidoye, B. (2012)	To examine the effect of financial development on poverty and inequality in African countries	Dynamic panel data analysis	Data on a sample of African countries			Financial development has not had a significant effect on poverty and inequality in African countries. The results confirm the deficiencies in African financial systems and highlight the fact that more efforts need to be made to improve access of poor households and small and medium enterprises to financial services.

Effective financial development, inequality and poverty	Humaira, A. (2012)	To examine the relationships 1) Income inequality and economic growth, 2) Financial development, human capital, and income inequality, and 3) Financial development, human capital, and poverty	Panel data techniques of dynamic and static GMM	Data for 107 developed and developing countries over the periods 1960-2010 and 1980-2010	Gini, Texas index as indicators of income inequality and various measures of poverty	Growth rate of real GDP Private credit to GDP Primary and secondary schooling enrollment	Income inequality and economic growth are inter-dependent on each other. There exists an inverse relationship between initial inequality and economic growth. The changes in income inequality follow the pattern identified by Kuznets (1955) known as Kuznets' hypothesis. The results also show that financial development helps in reducing income inequalities and in alleviating poverty, only when there is a sufficient level of human capital available. The study introduced the term "effective financial development," which means that financial development is effective in accelerating growth levels, reducing income inequalities, and alleviating poverty only if there is a sufficient level of human capital available.
Financial development and income inequality: A panel data approach	Jauch, S., & Watzka, S. (2012)	To analyze the link between financial development and income inequality	Panel data analysis	Data for 138 developed and developing countries over the years 1960 to 2008	Gini coefficient	Credit to GDP Deposits to GDP GDP per capita Inflation Government expenditures Agriculture Legal origin (UK, FR, GE)	Results reject theoretical models that predict a negative impact of financial development on income inequality measured by the Gini coefficient. Controlling for country fixed effects and GDP per capita; the study finds that financial development has a positive effect on income inequality. These results are robust to different measures of financial development, econometric specifications, and control variables. Better developed financial markets lead to higher gross income inequality.

Source: Author's own preparation based on literature survey

Annex 2.3: List of variables collected and/prepared for the 5-year period dataset (Panel dataset)

Variable	Name
1 Domestic credit provided by banking sector (% of GDP)	dcrebank
2 Domestic credit to private sector (% of GDP)	privcred
3 Exports of goods and services (% of GDP)	xgdp
4 GDP growth (annual %)	gdpr
5 GDP per capita (constant 2000 US\$)	gdpper2
6 GDP per capita (constant LCU)	gdpperlcu
7 GDP per capita growth (annual %)	gdppergr
8 GDP per capita, PPP (constant 2000 international \$)	gdperppp
9 GDP, PPP (constant 2000 international \$)	gdppp
10 General government final consumption expenditure (% of GDP)	gov
11 GINI index	giniwb
12 Gross capital formation (% of GDP)	gkf
13 Gross capital formation (annual % growth)	gkfgr
14 Gross capital formation (constant 2000 US\$)	gkf2
15 Gross capital formation (constant LCU)	gkf1cu
16 Gross fixed capital formation (% of GDP)	gkf
17 Gross fixed capital formation (annual % growth)	gkfgr
18 Gross fixed capital formation (constant 2000 US\$)	gkf2
19 Gross fixed capital formation (constant LCU)	gkf1cu
20 Industry, value added (% of GDP)	indusva
21 Inflation, consumer prices (annual %)	infla
22 Inflation, GDP deflator (annual %)	inflagdp
23 Interest rate spread (lending rate minus deposit rate)	ispread
24 Liquid liabilities (M3) as % of GDP	m3gdp
25 Manufacturing, value added (% of GDP)	manuav
26 Manufacturing, value added (annual % growth)	manuavgr
27 Modern sector (value added manufacturing sector + service sector) % GDP	induserva
28 Money and quasi money (M2) as % of GDP	m2gdp
29 Openness (X+M)/GDP	open
30 Population growth (annual %)	popgr
31 Population, total	popwb
32 Real interest rate (%)	ri
33 Services, etc., value added (% of GDP)	serva
34 Bank liquid reserves to bank assets ratio	Liquireser
35 IPC2000	ipcw
36 Exports of goods and services (annual % growth)	xgrowth
37 Foreign direct investment, net inflows (% of GDP)	fdigdp
38 Foreign direct investment, net inflows (BoP, current US\$)	fdinflow
39 Gross domestic savings (% of GDP)	dsavgdp
40 Gross savings (% of GDP)	savgdp
41 Total debt service (% of exports of goods, services and income)	debserx
42 Total debt service (% of GNI)	debsergdp
43 Trade (% of GDP)	tradegdp
44 Index GDP deflator 1995	Deflaifs
45 Change in deflator	Deflach
46 GDP/CPI	gdpcpiifs
47 2 year period moving average of real claims on private sector (22line IFS) /realGDP	reprivaifs
48 2 year period moving average of real claims on private sector and other banking (22line IFS+42line IFS)/realGDP	reprivplusifs
49 2 period moving average of real money plus quasimoney (35 line IFS) /realGDP	rem2ifs
50 22 line IFS /gdp (Nominal values)	privaifs
51 (22+42) lines IFS/gdp (Nominal values)	privplusifs
52 35 IFS/gdp (Nominal values)	m2ifs
53 Population growth (annual %)	poppt
54 Exchange rate Penn World Tables (PWT)	xratpt
55 PPPoverGDP (PWT)	ppppt
56 Real GDP percapita (PWT)	cgdppt
57 GovernmentCGDP (PWT)	cgpt
58 InvestmentshareCGDP (PWT)	cipt
59 Price level of GDP (PWT)	ptt
60 Open in current prices (PWT)	opencpt
61 RealGDPpercapita const. prices Laspeyres (PWT)	rgdplpt
62 Real GDP perc const. prices Chain series (PWT)	rgdpchpt
63 Openess in constant prices (PWT)	openkpt
64 Government share of real GDP perc const. Laspeyres (PWT)	kgpt
65 Investment share of real GDP perc const. Laspeyres (PWT)	kipt
66 Growth rate of real GDP percapita (PWT)	grdpchpt
67 Household Income inequality Texas indicator	ehitex
68 Deininger Squire GINI	ginids
69 Average school years	School
70 Secondary education	Edusec
71 Dummy legal origin British=1 French=0	dleg
72 Dummy lower middle income=1 other=0	dinc1
73 Dummy uppermiddle inc.= 1 other=0	dinc2
74 Etnological Fractionalisation	etfrac
75 Longitud	long
76 Latitud	lat
77 Dummy for income Uppermiddle= 1 Lower middle or low= 0	dinc
78 Temporal dummy for the 70's	t70
79 Temporal dummy for the 80's	t80
80 Temporal dummy for the 90's	t90
81 Temporal dummy for 2000's	t2000

Source: Author's own preparation

Annex 2.4: Descriptive Statistics finance – growth dataset

Variable	Obs	Mean	Std. Dev.	Min	Max
privcred	32	35.41853	14.10597	13.45289	66.52242
xgdp	32	37.60117	20.70972	9.565512	80.76518
gdpgr	32	3.179223	1.361936	.6873254	6.064687
gdpper2	31	3307.322	2721.077	610.0097	14373.54
gdpperlcu	32	140690.9	421281.3	10.2891	1874952
gdppergr	32	1.483037	1.388872	-1.338694	4.709121
gdperppp	31	5869.741	2951.753	2306.681	15400.51
gdppp	31	9.07e+10	2.14e+11	3.04e+08	9.97e+11
gov	32	14.73282	5.071536	6.850356	29.26423
giniwb	23	50.32586	5.702125	38.53333	59.23444
gkf	32	23.13607	5.563139	15.7389	41.5988
gkfgr	31	5.831405	4.474246	-10.16066	15.51283
gkf2	29	9.87e+09	2.35e+10	5.86e+07	9.36e+10
gkflcu	31	7.22e+11	2.26e+12	725972.5	9.77e+12
gkf	32	22.0729	6.17139	14.34553	45.30039
gkfgr	31	5.699509	4.420973	-5.643147	15.86529
gkf2	29	3.18e+11	1.66e+12	5.73e+07	8.93e+12
gkflcu	31	6.81e+11	2.12e+12	725972.5	9.20e+12
indusva	31	29.39055	7.997272	17.79553	47.62382
infla	32	88.5909	190.2058	2.850124	863.3508
inflagdp	32	82.26836	177.1577	3.310861	836.4301
ispread	32	40.66533	143.6897	2.577133	801.6519
m3gdp	32	43.06936	16.76772	22.22023	77.87441
m2gdp	32	37.78949	16.60212	17.61506	73.95882
open	32	78.54876	41.06058	18.30838	165.7031
popgr	32	1.605239	.8689008	.0832524	2.940171
popwb	32	1.26e+07	2.79e+07	43388.56	1.40e+08
serva	31	57.0458	9.659227	39.32655	83.79005
liquireser	32	5.31e+08	3.00e+09	.2274398	1.70e+10
ipcwb	32	49.76283	20.21235	22.9089	94.04823
xgrowth	31	5.097813	2.655667	-.8779451	10.03979
fdigdp	30	3.015304	2.604353	.4438744	10.69825
fdiinflow	30	7.36e+08	1.61e+09	6723800	6.73e+09
dsavgdp	32	17.21137	6.242981	6.16771	30.38589
savgdp	32	16.95047	4.809817	.1580599	27.71458
debserx	29	20.36427	12.76172	3.215176	52.50123
debsergdp	30	11.27052	28.05007	1.667006	158.652
tradegdp	31	78.81153	42.26643	18.30838	165.7031
deflaifs	31	57.00114	20.59714	30.45676	99.47943
deflachan	31	69.7181	160.1893	2.471828	755.4448
gdpcpiifs	32	1.16e+10	6.57e+10	2.998572	3.71e+11
reprivaiifs	32	39.308	49.3851	6.930094	255.3319
reprivplus~s	31	44.90377	49.00037	6.930094	255.3319
rem2ifs	32	48.84603	48.13819	8.147469	240.3488
privaiifs	32	30.13252	14.45863	6.888415	59.67315
privplusifs	32	34.59279	14.66371	6.888415	61.71946
m2ifs	32	39.9621	16.95636	8.101501	78.40444
poppt	32	12612.25	28123.03	42.23771	141644.6
cgdppt	32	4614.62	2515.068	1256.733	12794.41
cgpt	32	25.178	12.93993	11.81314	60.37294
cipt	32	14.57011	4.506918	4.651613	21.55686
ptt	32	49.56987	13.70043	22.48161	91.83736
opencpt	32	82.15161	44.45655	16.49471	183.2226
rgdplpt	32	6248.715	3296.931	2042.612	17387.96
rgdpchpt	32	6253.065	3303.69	2039.625	17396.51
openkpt	32	79.31156	53.60019	13.46714	253.88
kgpt	32	26.11538	13.68536	11.98343	61.53147
kipt	32	13.5982	4.392528	3.850322	21.69657
rgdpchpt	31	1.641308	1.274043	-1.525143	4.346364
ehlitex	26	45.92872	3.152584	40.10873	53.50308
ginids	16	54.00268	4.409988	44.7695	59.544
school	24	3.649167	1.677283	.9	9.09
edusec	24	31.0625	15.9771	6	69
dleg	32	.375	.4918694	0	1
dincl	32	.4375	.5040161	0	1
dinc2	32	.5	.5080005	0	1
etfrac	23	26.47826	21.81715	1	68
longi	32	-70.83334	12.62358	-97.229	-46.769
lat	32	4.632938	17.4095	-36.676	24.7
dinc	32	.53125	.5070073	0	1
gkf2pergr	29	3.960131	4.293346	-12.42772	14.63682
gkf2pergr	29	3.737931	3.934828	-5.930117	14.63682
eficien1	28	.3252252	1.484126	-3.60418	2.389622
eficien2	28	.395178	1.654776	-4.428897	2.791482
iprivcred	27	23.75212	13.36856	5.000812	64.70806
iisread	1	4.4	.	4.4	4.4
im3gdp	27	25.5463	10.58873	12.60597	57.40803
im2gdp	25	22.65408	10.32108	11.99272	58.51783

ireprivaiifs	18	20.65911	14.42672	7.584129	53.64561
ireprivplu~s	13	23.80575	13.45744	7.584129	50.06069
irem2ifs	18	25.65766	13.4631	9.124658	62.61911
ipriivaifs	23	21.75114	15.69554	2.082644	63.50051
iprivplusifs	19	26.0004	17.42043	3.111555	72.31192
im2ifs	23	27.2405	15.10197	9.263047	81.27695
icgdppt	32	1345.736	841.8865	449.34	4627.38
irgdplpt	31	4995.812	3192.18	1768	16856.35
irgdpchpt	31	5007.839	3214.482	1757.1	16911.31
lprivcred	32	3.487275	.4138545	2.599194	4.197539
lxgdp	32	3.467803	.5929699	2.258164	4.391546
lqdpgr	32	1.041712	.5282218	-.3749475	1.802483
lqdp2	31	7.844632	.7294546	6.413475	9.573144
lqdp2perlcu	32	8.899806	2.545495	2.331085	14.44409
lqdp2perppp	31	8.571725	.4602455	7.743565	9.642156
lqdp3	31	23.22908	2.237025	19.53199	27.62768
lgov	32	2.632123	.3508015	1.924301	3.376366
lginiwb	23	3.912181	.1161289	3.651524	4.081503
lgkf	32	3.116233	.2232992	2.756135	3.728071
lgfkf2	29	21.22577	2.608672	17.86341	29.82079
lgkf2	29	21.02985	2.067498	17.88704	25.2621
lgkflcu	31	22.09022	3.753514	13.49527	29.9106
lgfkf	32	3.062908	.2455976	2.663438	3.813316
lgfkflcu	31	22.05045	3.741281	13.49527	29.85025
lindusva	31	3.344778	.2738085	2.878947	3.863333
lispread	32	2.311545	1.130871	.9466777	6.686675
linfla	32	3.010296	1.55752	1.047362	6.760821
linflagdp	32	2.968422	1.545477	1.197208	6.729143
lm3gdp	32	3.691707	.3810221	3.101003	4.355097
lopen	32	4.212802	.5863083	2.907359	5.110198
lpopgr	32	.2045898	.9094498	-2.485878	1.078468
lpopwb	32	14.55791	2.220526	10.67795	18.75974
lserva	31	4.030913	.1611945	3.6719	4.428314
lliquireser	32	3.392456	3.79581	-1.48087	23.55613
lipcwb	32	3.831273	.3920169	3.131526	4.543808
lfdigdp	30	.8137399	.7568818	-.8122137	2.37008
lfdiinflow	30	18.73531	1.86338	15.72116	22.6303
ldebserx	29	2.789833	.727589	1.167882	3.960837
ldebsergdp	30	1.799069	.8094446	.5110295	5.066713
ltradegdp	31	4.209714	.5972822	2.907359	5.110198
ldeflaifs	31	3.977049	.3743223	3.416308	4.599951
lqdp2plifs	32	6.534525	5.030617	1.098136	26.64081
lreprivaiifs	32	3.347748	.6951356	1.935873	5.542564
lreprivplu~s	31	3.534331	.6600915	1.935873	5.542564
lrem2ifs	32	3.648369	.6309673	2.097707	5.482091
lprivaifs	32	3.285593	.5160832	1.929841	4.088882
lprivplusifs	32	3.436012	.5104539	1.929841	4.122599
lm2ifs	32	3.592495	.4665216	2.092049	4.361881
lpoppt	32	7.642322	2.223185	3.743314	11.86108
lqdppt	32	8.308129	.5159208	7.136271	9.456763
lqgpt	32	3.122621	.4408434	2.469213	4.100541
lcipt	32	2.619408	.3778485	1.537214	3.070694
lopecpt	32	4.245117	.6138529	2.80304	5.210701
lrgdplpt	32	8.626149	.4770092	7.621985	9.763534
lrgdpchpt	32	8.62649	.477778	7.620521	9.764025
lopenkpt	32	4.14197	.7199495	2.600253	5.536862
lkgpt	32	3.154813	.4497298	2.483525	4.119549
lkpt	32	2.544794	.3969859	1.348157	3.077154
lehiitex	26	3.824842	.0683032	3.691594	3.979739
lginids	16	3.985742	.0849032	3.801527	4.086716
lschool	24	1.193782	.4767079	-.1053605	2.207175
ledusec	24	3.290141	.5902816	1.791759	4.234107
letfrac	23	2.852942	1.066294	0	4.219508
lgkf2per	28	1.331027	.6174531	-.0412856	2.68354
lgfkf2per	28	1.115377	.7633525	-.0734223	2.68354
liprivcred	27	3.023013	.562086	1.6096	4.169886
lim2gdp	25	3.046868	.3680664	2.4843	4.069332
lim3gdp	27	3.172624	.3618986	2.534171	4.050184
lireprivaiifs	18	2.839048	.6057463	2.026058	3.9824
lireprivpl~s	13	3.009676	.6129677	2.026058	3.913236
lirem2ifs	18	3.135372	.4703963	2.21098	4.137071
liprivaiifs	23	2.845391	.733531	.7336381	4.151048
liprivplu~s	19	3.039042	.7276647	1.135123	4.2809889
lim2ifs	23	3.195915	.4568097	2.226033	4.397862
licgdppt	32	7.069039	.5016175	6.10778	8.439746
lirgdplpt	31	8.371144	.5199235	7.477604	9.732483
lirgdpchpt	31	8.372002	.5227017	7.47142	9.735738

Source: Author's own preparation based on STATA output

Annex 2.5: Descriptive statistics finance – inequality cross dataset

Dataset with Deininger and Squire Gini index

Variable	Obs	Mean	Std. Dev.	Min	Max
privcred	16	31.84066	14.35132	17.38453	66.0004
xgdp	16	28.88717	17.07823	9.649683	83.06311
gov	16	11.70573	3.065094	6.512655	16.81702
giniwb	16	51.52716	5.314652	38.53333	59.39375
indusva	16	31.74935	7.551059	18.05614	48.91785
infla	16	127.6667	230.7501	2.014874	633.7258
inflagdp	16	120.7471	224.6546	2.245232	665.561
ispread	16	27.15395	62.34953	3.477685	257.1569
m3gdp	16	33.68566	8.25424	22.04321	51.4304
manuav	16	18.54926	3.923444	10.28133	26.51313
manuavgr	16	2.201977	1.475834	-.0424264	5.393981
induserva	16	86.73865	7.09897	74.17316	100.0577
m2gdp	16	28.02797	8.439849	17.88021	47.85943
open	16	55.90275	21.49837	18.52007	99.68374
popgr	16	2.069368	.4909109	.9702017	2.934877
popwb	16	2.38e+07	3.93e+07	2396102	1.50e+08
ri	16	13.39448	14.24111	-2.521703	60.90346
serva	16	54.9893	6.705959	45.6397	73.57991
liquireser	16	1.29e+09	5.15e+09	4.437713	2.06e+10
ipcwb	16	41.23884	15.94138	19.20408	90.26563
xgrowth	16	5.113652	3.170733	1.087947	10.93828
fdigdp	16	2.02709	.8481184	.88238	3.781315
fdiinflow	16	1.40e+09	2.44e+09	6.97e+07	8.06e+09
debserx	16	26.20361	11.53489	7.165694	52.1441
debsergdp	16	7.525747	3.091954	2.911341	15.04506
tradegdp	16	60.4956	33.09281	18.52007	159.5417
deflaifs	16	51.09196	22.29106	22.52954	112.0595
deflachan	16	131.4691	258.3506	2.299955	887.7172
reprivaifs	16	42.07393	80.66857	6.02045	341.7635
reprivplus~s	16	48.52539	79.39224	6.02045	341.7635
rem2ifs	16	43.20238	63.58042	7.36756	279.7024
privaifs	16	24.66243	14.42373	5.843575	58.22134
privplusifs	16	30.5594	15.22614	5.843575	59.58186
m2ifs	16	29.41554	9.75402	7.163522	48.96369
cgdppt	16	4386.773	1460.199	1870.059	6938.4
cgpt	16	18.42906	3.366759	14.22864	24.16227
cipt	16	14.22386	4.03083	7.259091	19.50727
ptt	16	46.37722	7.876868	36.76136	63.42182
opencpt	16	60.5746	31.49606	18.42364	150.0209
rgdplpt	16	5294	1784.563	2320.636	8195.423
rgdpchpt	16	5291.839	1783.542	2313.871	8169.564
openkpt	16	55.34534	34.54416	15.76773	152.6318
kgpt	16	18.9258	3.705572	14.32136	26.13773
kipt	16	13.26943	3.812192	6.608182	18.87545
rgdpchpt	16	.6598295	1.177618	-.9440909	2.965
ehlitex	16	46.30795	3.219422	40.10873	53.03877
ginids	16	54.00722	4.416108	44.7695	59.61666
school	16	4.1775	1.167102	2.33	5.96
edusec	16	42.56406	14.69104	18.78	63.02
dleg	16	.0625	.25	0	1
dincl	16	.6875	.4787136	0	1
dinc2	16	.3125	.4787136	0	1
etfrac	16	25.1875	22.76904	4	68
longi	16	-76.26494	12.64568	-97.229	-46.769
lat	16	1.37525	17.06151	-33.554	18.561
dinc	16	.3125	.4787136	0	1
iprivcred	16	29.90243	13.33004	12.89166	58.11354
iispread	4	6.880224	3.679373	2	10
im3gdp	16	29.15234	8.334053	20.86758	48.22992
im2gdp	16	23.3129	7.365874	9.626105	38.76756
ireprivaifs	14	21.22342	11.24144	10.30174	50.22849
ireprivplu~s	13	29.71033	17.88552	10.30174	65.24593
irem2ifs	14	26.7918	9.207552	12.18769	43.3028
iprivaifs	14	21.09825	11.19795	8.333333	47.32436
iprivplusifs	13	29.43584	17.84792	8.333333	67.86399
im2ifs	14	26.23893	8.646244	11.49867	41.63246
icgdppt	16	2956.62	972.5242	1312.93	4960.16
irgdplpt	16	5173.463	1725.682	2303.31	8815.01
irgdpchpt	16	5201.232	1754.259	2305.97	8925.36
lprivcred	16	3.377703	.4100783	2.855581	4.189661
lxgdp	16	3.239722	.4949812	2.266925	4.4196
lgov	16	2.423458	.2897672	1.873747	2.822392
lginiwb	16	3.936782	.1085159	3.651524	4.084189

lindusva	16	3.430126	.2479457	2.893486	3.890142
lispread	16	2.411795	1.068672	1.246367	5.549686
linfla	16	3.502949	1.579532	.7005566	6.451616
linflagdp	16	3.296905	1.687826	.8088089	6.50063
lm3gdp	16	3.48988	.2394788	3.093005	3.940229
lmanuav	16	2.898194	.222659	2.330329	3.27764
linduserva	16	4.459715	.082746	4.306402	4.605747
lm2gdp	16	3.293695	.2859901	2.883694	3.868268
lopen	16	3.945888	.4261074	2.918855	4.602003
lpopgr	16	.6970656	.2651696	-.0302513	1.076666
lpopwb	16	16.17489	1.20583	14.68935	18.82542
lserva	16	4.000694	.1151413	3.820778	4.298372
lliquireser	16	4.247434	5.237587	1.490139	23.74864
lipcwb	16	3.659618	.3510402	2.955123	4.502757
lfdigdp	16	.6283268	.4086451	-.1251325	1.330072
lfdiinflow	16	19.93016	1.495253	18.05945	22.81054
ldebserx	16	3.159677	.5050128	1.969305	3.954011
ldebsergdp	16	1.935508	.4307324	1.068614	2.71105
ltradegdp	16	3.98447	.4972805	2.918855	5.072306
ldeflaifs	16	3.857179	.3943969	3.114828	4.71903
lreprivaifs	16	3.158951	.8633575	1.795162	5.834119
lreprivplu~s	16	3.396219	.8543897	1.795162	5.834119
lrem2ifs	16	3.399073	.714466	1.997087	5.633726
lprivvaifs	16	3.062093	.5544475	1.765343	4.064252
lprivplusifs	16	3.286846	.5724832	1.765343	4.087351
lm2ifs	16	3.311595	.4314038	1.969002	3.891079
lcgdppt	16	8.32812	.365446	7.533725	8.844827
lcgpt	16	2.898651	.1796262	2.655257	3.184793
lcipt	16	2.610984	.3189708	1.982255	2.970787
lopecpt	16	3.992048	.4881448	2.913634	5.010775
lrgdpplpt	16	8.515154	.3672976	7.749597	9.011332
lrgdpchpt	16	8.514677	.3676637	7.746677	9.008171
lopekpt	16	3.863378	.5530002	2.757965	5.028028
lkgpt	16	2.923233	.1904664	2.661752	3.26338
lkipt	16	2.540972	.3202004	1.888309	2.937862
lehiitex	16	3.833031	.0699591	3.691594	3.971023
lginids	16	3.985818	.0850004	3.801527	4.087935
lschool	16	1.390032	.2980408	.8458682	1.785071
ledusec	16	3.686674	.3852561	2.932792	4.143452
letfrac	16	2.820047	.9524823	1.386294	4.219508
liprivcred	16	3.306951	.4409449	2.556581	4.062399
lim2gdp	16	3.098924	.3368808	2.264479	3.657584
lim3gdp	16	3.338206	.2636102	3.038197	3.87598
lireprivaifs	14	2.946233	.4680064	2.332313	3.916582
lireprivpl~s	13	3.229662	.5948913	2.332313	4.178164
lirem2ifs	14	3.232918	.3482012	2.500427	3.768217
liprivaifs	14	2.935875	.4844841	2.120264	3.857025
liprivplus~s	13	3.210975	.6240337	2.120264	4.217505
lim2ifs	14	3.212579	.353032	2.442231	3.72888
licgdppt	16	7.937977	.3468839	7.180017	8.509193
lirgdpplpt	16	8.496684	.3484946	7.742103	9.084211
lirgdpchpt	16	8.500873	.3521241	7.743257	9.096652

Dataset with World Bank Gini

Variable	Obs	Mean	Std. Dev.	Min	Max
privcred	23	33.18685	14.70794	14.02631	68.40024
xgdp	23	31.40003	20.31467	10.17324	82.81303
gov	23	12.88854	4.055831	6.715854	21.40861
giniwb	23	50.37485	5.753223	38.53333	59.23444
indusva	23	31.41364	7.481719	17.79181	49.06348
infla	23	149.9689	286.5053	1.947808	1145.999
inflagdp	23	148.8486	294.8317	3.041092	1214.768
ispread	23	56.81385	179.125	3.477685	851.2066
m3gdp	23	38.92526	14.87285	21.89435	86.00103
manuav	23	17.48283	5.090138	7.392706	25.2303
manuavgr	23	1.701988	1.65108	-1.973357	4.918599
induserva	23	86.43349	8.008898	68.07928	99.57747
m2gdp	23	32.73828	13.19154	18.3804	68.11494
open	23	63.90546	36.94646	19.28616	178.9774
popgr	23	1.782642	.6989138	-.0466896	2.882724
popwb	23	1.90e+07	3.45e+07	137929.3	1.52e+08
ri	23	13.59997	12.74044	-2.494561	56.8102
serva	23	55.01984	7.545519	38.23478	73.90401
liquireser	23	8.97e+08	4.30e+09	4.386989	2.06e+10
ipcwb	23	51.49877	16.25871	31.02089	91.4607
xgrowth	22	4.744008	2.686813	.4203888	10.21009
fdigdp	23	2.630594	2.121446	.2723547	9.934148
fdiinflow	23	1.23e+09	2.30e+09	6800000	8.50e+09

debserx	23	24.43045	12.5091	3.215176	53.47926
debsergdp	23	7.570073	4.481525	1.574799	23.04703
tradegdp	23	67.05309	41.55977	19.28616	178.9774
deflaifs	23	60.08945	19.35992	34.71083	114.9437
deflachan	23	102.5938	200.4175	2.975541	794.7582
reprivaifs	23	37.78467	62.88938	5.89426	320.7791
reprivplus~s	22	44.05645	63.27946	5.89426	320.7791
rem2ifs	23	43.15795	49.82053	7.160843	262.8299
privaifs	23	26.70303	14.62222	5.739151	60.49361
privplusifs	23	31.38612	15.12066	5.739151	61.00949
m2ifs	23	34.5866	14.49781	6.968754	74.69539
cgdppt	23	4842.59	2240.053	1535.988	10393.15
cgpt	23	20.7971	6.937536	14.17458	43.10905
cipt	23	13.88651	4.197666	4.78381	19.59292
ptt	23	45.9191	9.994697	23.72667	62.67916
opencpt	23	68.23639	44.49806	19.30708	208.3043
rgdplpt	23	5727.983	2472.446	2076.019	11450.12
rgdpchpt	23	5727.972	2475.658	2075.074	11482.39
openkpt	23	64.83386	53.65444	15.41	253.88
kgpt	23	21.52686	8.335772	14.585	52.27
kipt	23	13.04039	4.098782	4.032381	18.99917
grdpchpt	22	.5732414	1.288025	-1.85875	2.840417
ehlites	20	46.09846	3.270531	40.10873	53.03877
ginids	16	54.00722	4.416108	44.7695	59.61666
school	23	4.306522	1.411262	1.45	6.62
edusec	22	45.73023	17.53765	15.225	74.92
dleg	23	.173913	.3875534	0	1
dincl	23	.5217391	.5107539	0	1
dinc2	23	.3913043	.4990109	0	1
etfrac	22	26.68182	22.3082	1	68
longi	23	-72.89383	12.9311	-97.229	-46.769
lat	23	.5098263	18.81829	-36.676	18.932
iprivcred	23	30.30868	12.90183	12.89166	58.11354
iispread	7	3.224574	7.760494	-12.94888	10
im3gdp	23	31.54564	9.968288	20.86758	58.25305
im2gdp	23	25.72044	9.183321	9.626105	48.82712
ireprivaifs	18	22.49596	11.51893	10.30174	50.22849
ireprivplus~s	17	29.57398	16.19604	10.30174	65.24593
irem2ifs	18	29.74321	10.83662	12.18769	51.28723
iprivaifs	19	22.25832	12.0187	8.333333	47.32436
iprivplusifs	18	28.94471	16.39652	8.333333	67.86399
im2ifs	19	29.55267	10.54569	11.49867	52.19297
icgdppt	23	3291.007	1886.81	1249.27	9981.96
irgdplpt	22	5761.835	2705.61	2303.31	13226.78
irgdpchpt	22	5808.231	2774.279	2305.97	13554.42
lprivcred	23	3.413863	.4273241	2.640935	4.225376
lxgdp	23	3.280727	.5732792	2.31976	4.416585
lgov	23	2.507863	.3228294	1.904471	3.063793
lginibw	23	3.913055	.1170211	3.651524	4.081503
lindusva	23	3.419225	.2458677	2.878738	3.893115
lispread	23	2.520475	1.276585	1.246367	6.746655
linfla	23	3.47409	1.714538	.6667048	7.044032
linflagdp	23	3.389247	1.76195	1.112217	7.102308
lm3gdp	23	3.60312	.3383135	3.086229	4.454359
lmanuav	23	2.812824	.3346728	2.000494	3.228046
linduserva	23	4.455076	.0959775	4.220673	4.600936
lm2gdp	23	3.420641	.3671458	2.911285	4.221197
lopen	23	4.018648	.5375769	2.959388	5.18726
lpopgr	22	.5645198	.3763459	-.3707707	1.058736
lpopwb	23	15.72889	1.531368	11.8345	18.8421
lserva	23	3.998741	.1371443	3.643745	4.302767
lipcwb	23	3.900841	.2819908	3.434661	4.515909
lfdlgdp	23	.7128814	.746892	-1.30065	2.295978
lfdiinflow	23	19.53501	1.775862	15.73243	22.86391
ldebserx	23	3.037183	.6370854	1.167882	3.979294
ldebsergdp	23	1.870681	.5856659	.4541275	3.137537
ltradegdp	23	4.045598	.5736976	2.959388	5.18726
ldeflaifs	23	4.050028	.3052107	3.547052	4.744443
lreprivaifs	23	3.216722	.7412415	1.773979	5.770753
lreprivplus~s	22	3.427491	.7347803	1.773979	5.770753
lrem2ifs	23	3.505209	.6369399	1.968628	5.571507
lprivaifs	23	3.150145	.5379877	1.747311	4.102538
lprivplusifs	23	3.319483	.551474	1.747311	4.11103
lm2ifs	23	3.452416	.4663715	1.941436	4.313418
lcgdppt	23	8.377808	.487795	7.336929	9.248902
lcgpt	23	2.993984	.2753592	2.65145	3.763733
lcipt	23	2.576102	.3618208	1.565237	2.975168
lopencpt	23	4.056906	.5783935	2.960472	5.339

lrgdplpt	23	8.560391	.4506824	7.638207	9.345755
lrgdpchpt	23	8.560206	.4511194	7.637752	9.34857
lopenkpt	23	3.933694	.6761897	2.735017	5.536862
lkgpt	23	3.019357	.2982707	2.679994	3.956423
lkipt	23	2.508255	.3802626	1.394357	2.944395
lehiitex	20	3.828384	.0710783	3.691594	3.971023
lginids	16	3.985818	.0850004	3.801527	4.087935
lschool	23	1.399078	.37761	.3715636	1.890095
ledusec	22	3.737037	.4492345	2.722939	4.316421
letfrac	22	2.84212	1.090093	0	4.219508
liprivcred	23	3.323992	.4308438	2.556581	4.062399
lim2gdp	23	3.187575	.3573989	2.264479	3.888286
lim3gdp	23	3.409098	.2896346	3.038197	4.064796
lireprivaiifs	18	3.001666	.4776808	2.332313	3.916582
lireprivpl~s	17	3.250075	.5435741	2.332313	4.178164
lirem2ifs	18	3.328474	.3739155	2.500427	3.937442
liprivaiifs	19	2.975357	.5129883	2.120264	3.857025
liprivplus~s	18	3.210327	.5882214	2.120264	4.217505
lim2ifs	19	3.322126	.3775736	2.442231	3.954948
licgdppt	23	7.977684	.4858859	7.130315	9.208535
lirgdplpt	22	8.563258	.4440265	7.742103	9.489999
lirgdpchpt	22	8.568571	.449755	7.743257	9.514468

Dataset with Inequality Texas Project Index

Variable	Obs	Mean	Std. Dev.	Min	Max
privcred	26	29.53768	10.88815	10.91918	52.3638
xgdp	26	34.19564	20.9191	8.190009	84.10463
gov	26	13.38566	4.736792	6.94356	28.68729
giniwb	19	50.31805	5.780409	38.476	59.41429
indusva	25	30.4098	8.048905	17.96852	46.9293
infla	26	104.1007	236.1868	2.882227	1021.879
inflagdp	26	81.69442	171.7053	3.935227	750.1761
ispread	26	64.63324	225.1125	2.738958	1132.039
m3gdp	26	34.26524	12.18882	20.97395	60.4529
manuav	25	17.02194	5.496007	3.596354	28.39219
manuavgr	25	3.403773	2.120645	-2.58596	6.969424
induserva	25	84.23603	7.807409	69.40699	100.2796
m2gdp	26	29.75204	11.82388	16.47078	57.12253
open	26	68.94987	38.37917	16.37467	161.9893
popgr	26	2.042719	.7853826	.3557548	3.074243
popwb	26	1.22e+07	2.61e+07	63947.91	1.21e+08
ri	26	12.05664	16.25559	-19.7937	71.02806
serva	26	55.70586	9.877821	42.76329	83.79005
liquireser	26	5.97e+08	3.05e+09	.2184966	1.55e+10
ipcwb	26	28.61828	22.98439	4.591164	82.80735
xgrowth	26	5.261137	2.817705	-2.619914	9.670848
fdigdp	24	1.880911	1.306841	.4817832	6.002963
fdiinflow	24	5.46e+08	1.15e+09	6593334	4.52e+09
debserx	23	22.43482	11.83911	4.103279	48.8937
debsergdp	24	12.52656	31.97494	1.679081	161.9893
tradegdp	25	68.20211	38.93343	16.37467	161.444
deflaifs	25	38.92964	26.18612	7.27775	93.79143
deflachan	25	88.27879	226.8364	2.725276	1005.608
reprivaiifs	26	34.00021	52.31362	7.551132	285.6243
reprivplus~s	25	41.81105	52.35117	7.551132	285.6243
rem2ifs	26	39.69243	40.94777	8.618702	230.6202
privaiifs	26	25.22079	11.88691	7.613407	48.38284
privplusifs	26	31.19335	13.33449	6.627642	58.21004
m2ifs	26	2279.683	11456.64	8.635545	58450.45
cgdppt	26	3579.201	2206.925	1213.2	11688.78
cgpt	26	21.54498	11.62217	10.69875	60.76
opencpt	26	71.9122	40.17	12.93825	155.7995
rgdplpt	26	5754.046	3280.114	2041.723	17182.9
rgdpchpt	26	5764.606	3287.683	2038.636	17192.88
openkpt	26	66.297	43.72736	13.244	164.0842
kgpt	26	22.86736	11.77435	11.45625	62.11733
kipt	26	13.41709	5.167114	3.840333	23.75825
grdpchpt	26	1.723829	1.095841	-.58775	3.871379
ehiitex	26	45.90579	3.051818	40.10873	53.50308
ginids	16	53.8547	4.322893	44.80639	59.50111
school	22	3.14	1.28061	.7	5.22
edusec	25	21.68	16.71506	4	71
dleg	26	.2692308	.4523443	0	1
dincl	26	.5	.509902	0	1
dinc2	26	.4230769	.5038315	0	1
etfrac	21	24.7619	21.67465	1	68

longi	26	-73.11611	12.97138	-97.229	-46.769
lat	26	4.630616	17.0511	-34.822	24.7
dinc	26	.4615385	.5083911	0	1
iprivcred	25	19.70162	12.53508	1.114744	59.95916
lispread	1	4.4	.	4.4	4.4
im3gdp	25	22.28107	12.96922	6.440906	65.32491
im2gdp	20	20.39094	11.60143	6.456929	60.00757
ireprivaiifs	16	18.31015	13.22414	3.118477	53.64561
ireprivplu~s	9	19.24345	9.188505	8.333333	33.13619
irem2ifs	16	22.35529	13.51508	8.780321	64.22901
iprivaifs	20	20.74011	18.31603	1.420309	66.66666
iprivplusifs	15	27.62013	26.67792	2.994363	100
im2ifs	22	25.07056	15.36826	7.900952	66.96517
icgdppt	25	943.2264	827.0106	349.76	4627.38
irgdplpt	25	4085.989	3039.832	1719.18	16856.35
irgdpchpt	23	4199.337	3177.918	1714.78	16911.31
lprivcred	26	3.317351	.3858188	2.390521	3.958215
lxgdp	26	3.360407	.5986861	2.102915	4.432062
lgov	26	2.541098	.3265777	1.937815	3.356454
lginib	19	3.911875	.1182446	3.650035	4.084535
lindusva	25	3.380481	.2699067	2.888622	3.848642
lispread	26	2.42263	1.329755	1.007578	7.031775
linfla	26	3.095604	1.568454	1.058563	6.929399
linflagdp	26	3.004378	1.527607	1.369969	6.620308
lm3gdp	26	3.478586	.3331423	3.043281	4.101864
lmanuav	25	2.766696	.4186314	1.279921	3.346114
linduserva	25	4.429469	.0932436	4.239987	4.607962
lm2gdp	26	3.325426	.3651841	2.801588	4.045198
lopen	26	4.085711	.5626654	2.795736	5.08753
lpopgr	26	.6033057	.5446873	-1.033514	1.123059
lpopwb	26	14.8619	1.930284	11.06582	18.6133
lserva	26	4.006693	.1622183	3.75568	4.428314
lliquireser	26	3.600485	4.17534	-1.520985	23.46585
lipcwb	26	3.069531	.777144	1.524134	4.416517
lfdigdp	24	.4489925	.6037992	-.7302611	1.792253
lfdiinflow	24	18.67423	1.718616	15.70157	22.23121
ldebserx	23	2.94391	.6373099	1.411786	3.889648
ldebsergdp	24	1.814741	.8674629	.5182469	5.08753
ltradegdp	25	4.070323	.5685044	2.795736	5.084158
ldeflaifs	25	3.427819	.718389	1.984822	4.541073
lreprivaiifs	26	3.177311	.6795744	2.021698	5.654677
lreprivplu~s	25	3.451501	.6535131	2.021698	5.654677
lrem2ifs	26	3.465134	.5806248	2.153934	5.440772
lprivaifs	26	3.111044	.5103626	2.029911	3.879145
lprivplusifs	26	3.328052	.5299772	1.891249	4.064058
lm2ifs	26	3.700416	1.542415	2.155887	10.97593
lcgdppt	26	8.045414	.5152112	7.101017	9.366385
lcgpt	26	2.968559	.4305635	2.370127	4.106932
lcipt	26	2.60763	.4350813	1.540802	3.15454
lopecpt	26	4.116743	.59681	2.560188	5.04857
lrgdplpt	26	8.535409	.4878472	7.621549	9.75167
lrgdpchpt	26	8.536921	.4886452	7.620036	9.752251
lopecpt	26	3.985278	.6687953	2.583545	5.10038
lkgpt	26	3.034777	.418616	2.438535	4.129025
lkipt	26	2.510654	.4489945	1.345559	3.16793
lehiitex	26	3.824476	.0662938	3.691594	3.979739
lginids	16	3.983107	.0834967	3.802351	4.085995
lschool	22	1.045906	.4900208	-.356675	1.652497
ledusec	25	2.822876	.7248255	1.386294	4.26268
letfrac	21	2.767774	1.073909	0	4.219508
liprivcred	25	2.746461	.8025857	.1086247	4.093664
lim2gdp	20	2.895801	.4883278	1.865154	4.094471
lim3gdp	25	2.973595	.509187	1.862669	4.179373
lireprivaiifs	16	2.660609	.7529744	1.137345	3.9824
lireprivpl~s	9	2.842979	.5229993	2.120264	3.500626
lirem2ifs	16	2.97647	.5066469	2.172513	4.162455
liprivaifs	20	2.678734	.9090005	.3508744	4.199705
liprivplus~s	15	2.953466	.8884841	1.096731	4.60517
lim2ifs	22	3.063738	.5682235	2.066983	4.204173
licgdppt	25	6.672474	.529236	5.857247	8.439746
lirgdplpt	25	8.162466	.5094636	7.449603	9.732483
lirgdpchpt	23	8.179341	.531804	7.44704	9.735738

Source: Author's own preparation based on STATA output

Annex 2.6: Descriptive statistics panel datasets

Variable	Obs	Mean	Std. Dev.	Min	Max
privcred	264	31.61344	17.41502	2.412088	97.64572
xgdp	254	33.88821	20.58763	6.349001	103.7003
gdpg	267	3.502648	2.872121	-5.131217	11.68093
gdppergr	265	1.601612	2.720819	-7.180486	9.452872
gdperppp	182	5814.773	3101.476	1722.002	17055.53
gdppp	182	9.26e+10	2.19e+11	1.58e+08	1.32e+12
gov	248	13.7896	5.657492	4.013033	34.92996
giniwb	81	50.3802	6.420974	34.285	60.32
gkf	253	22.38104	6.82542	7.042868	53.19942
gkfgr	232	5.643375	11.46405	-66.25714	65.85995
gkf2	224	9.92e+09	2.32e+10	2.88e+07	1.33e+11
gkflcu	232	7.47e+11	2.35e+12	440920	1.49e+13
gfkf	237	21.01995	6.177995	9.511889	49.65413
gfkfgr	213	5.848841	10.98802	-16.41526	91.30591
gfkf2	207	3.00e+11	1.61e+12	2.42e+07	1.41e+13
gkflcu	216	7.25e+11	3.09e+12	440920	3.25e+13
indusva	232	30.01066	8.916017	13.94226	57.42371
infla	251	73.88075	334.5732	.1204436	3357.608
inflagdp	267	70.41144	339.6711	-5.825557	3858.523
ispread	149	59.09513	554.3627	-18.22867	6749.487
m3gdp	264	38.36033	20.33012	7.66148	117.6824
manuav	222	16.29049	6.714143	2.244479	38.57161
manuavgr	236	3.533661	4.940767	-8.522845	34.64774
induserva	233	82.812	15.16887	0	106.5138
m2gdp	262	33.46943	18.87119	7.182123	108.3113
open	254	71.47382	42.22504	11.83946	226.8713
popgr	283	1.762252	1.050612	-1.484446	4.987817
popwb	288	1.14e+07	2.60e+07	41000	1.79e+08
ri	152	10.36828	31.13257	-46.40385	351.7406
serva	228	55.14478	9.528408	30.26689	83.86771
liquireser	264	4.52e+08	2.99e+09	.0944338	2.59e+10
ipcw	255	39.81194	42.78833	1.05e-10	150.1564
xgrowth	228	5.375978	6.642598	-15.37556	38.53033
fdigdp	206	2.98848	4.084932	-3.883453	25.13427
fdiinflow	208	7.43e+08	2.61e+09	-2.03e+08	2.00e+10
dsavgdp	253	17.18088	8.227976	-8.263635	39.62817
savgdp	215	16.74564	7.295753	-23.83713	44.6541
debserx	176	20.69787	15.29588	.4694692	70.53889
debsergdp	201	10.7043	26.02949	.221293	176.3112
deflairs	220	46.17832	44.48049	0	225.24
deflach	211	53.45211	278.8158	-53.30803	2996.858
gdpcpiifs	226	1.27e+10	1.10e+11	.0042088	1.07e+12
reprivairs	217	35.71162	75.46335	2.787389	909.068
reprivplus~s	192	42.94326	79.52393	2.787389	909.068
rem2ifs	218	44.18487	70.31946	4.033944	745.0216
privairs	240	27.89518	17.71156	1.523407	89.1443
privplusifs	215	33.53947	18.41413	2.137491	97.5
m2ifs	241	37.49553	20.46438	4.034976	117.7136
poppt	287	11472.63	26238.56	38.864	179959.7
cgdppt	266	4100.27	3533.447	372.156	19428.16
cgpt	266	23.26554	13.25799	6.15	66.074
cipt	266	14.88208	6.252313	3.438	34.746
opencpt	266	77.42032	47.38044	6.288	281.016

rgdplpt		260	6028.534	3456.023	1696.74	20032.94
rgdpchpt		260	6036.3	3462.574	1695.496	20015.85
openkpt		260	70.30717	46.32109	7.242	253.88
kgpt		260	23.93954	13.03953	7.784	67.308
kipt		260	13.64555	5.865402	2.808	30.588

grdpchpt		259	1.79239	2.9174	-8.13	16.198
ehiitex		142	45.79661	3.259418	38.11462	55.97543
ginids		49	53.95431	5.155374	41.86358	62.5
school		213	4.450282	1.785311	.7	9.11
edusec		190	40.62282	22.01923	4	92.175

dleg		288	.375	.4849656	0	1
dincl		288	.4375	.4969419	0	1
dinc2		288	.5	.5008703	0	1
etfrac		207	26.47826	21.38932	1	68
longi		288	-70.83334	12.4464	-97.229	-46.769

lat		288	4.632938	17.16514	-36.676	24.7
dinc		288	.53125	.4998911	0	1
gkf2per		202	643.1625	574.961	26.44791	3606.078
gfkf2per		188	11155.65	51677.95	19.97906	354785.7
gdpper2gr		232	1.521596	3.049185	-11.02239	11.77002

gkf2pergr		201	3.619139	10.8431	-67.12028	55.95441
gfkf2pergr		186	3.948111	10.07233	-18.2397	67.91039
eficien1		198	.4423708	3.036633	-14.6875	19.66088
eficien2		183	.2596017	2.896678	-18.27429	5.913094
iprivcred		255	30.42238	18.04744	1.114744	112.6264

igdpper2		254	3023.512	2776.888	446.191	16600.43
igdpperlcu		262	144590.6	426847.5	9.300464	2198259
igdperppp		178	5706.259	3078.702	1706.084	17032.13
igdppp		178	8.98e+10	2.11e+11	1.83e+08	1.27e+12
im2gdp		232	32.57655	18.11782	6.156677	95.14911

iispread		122	27.66625	210.9445	-34.71422	2334.963
im3gdp		254	35.94987	19.51197	6.440906	117.3035
iliquireser		257	4.25e+08	2.94e+09	.1072765	2.52e+10
igdpcpiifs		211	1.02e+10	9.77e+10	.0022226	1.07e+12
ireprivaiifs		188	45.20433	177.2151	3.118477	2002.281

ireprivplu~s		163	54.20584	189.5387	3.310428	2002.281
irem2ifs		189	54.29702	198.0726	4.497427	2549.05
iprivaiifs		228	26.31762	17.22578	0	95.45458
iprivplusifs		197	31.88374	17.66657	0	95.45458
im2ifs		229	35.47093	20.44322	0	118.9811

icgdpt		266	3780.355	3388.266	349.76	19088.04
irgdplpt		260	5849.335	3440.258	1719.18	20641.32
irgdpchpt		260	5858.991	3449.128	1714.78	20576.05
t70		287	.2229965	.4169831	0	1
t80		287	.2229965	.4169831	0	1
t90		287	.2229965	.4169831	0	1
t2000		287	.1114983	.3152979	0	1

lprivcred		264	3.294325	.592061	.8804927	4.581346
lxgdp		254	3.331255	.6420787	1.848298	4.641505
lgdperppp		182	8.545228	.4895849	7.451243	9.74423
lgdppp		182	23.24556	2.229758	18.87808	27.90846
lgov		248	2.545019	.3977508	1.389547	3.553345

lginiwb		81	3.911162	.132534	3.534708	4.099664
lgkf		253	3.063504	.301196	1.952016	3.974047
lgkf2		224	21.11555	2.019168	17.17603	25.61254
lgkflcu		232	22.46665	3.553826	12.99662	30.33303
lgkfkf		237	3.005851	.2796152	2.252542	3.905082

lgfkf2		207	21.38969	2.574611	16.99999	30.27891
lgfkflcu		216	22.36689	3.509167	12.99662	31.11255
lindusva		232	3.357639	.2987059	2.634924	4.050457
linfla		251	2.313052	1.559715	-2.116574	8.118984
lm3gdp		264	3.518897	.5062931	2.036205	4.76799

lmanuav		222	2.687037	.495622	.8084733	3.652517
lopen		254	4.082801	.6393168	2.471438	5.424383
lpopwb		288	14.4523	2.165922	10.62133	19.00228
lserva		228	3.995421	.1706449	3.410054	4.429241
lliquireser		264	3.278802	3.629544	-2.359856	23.97853

lipcwb		255	.870655	5.573215	-22.97302	5.011678
ldebserx		176	2.697971	.9101978	-.7561525	4.256164
ldebsergdp		201	1.657332	.9950857	-1.508268	5.17225
ldeflaifs		217	2.126627	4.642229	-26.23726	5.417167
lgdpcpiifs		226	5.975368	4.344992	-5.47058	27.69969

lreprivaifs		217	3.15048	.7603086	1.025105	6.81242
lreprivplu~s		192	3.388485	.729896	1.025105	6.81242
lrem2ifs		218	3.477103	.6675055	1.394745	6.613413
lprivaiifs		240	3.117263	.689644	.4209494	4.490256
lprivplusifs		215	3.334633	.6565454	.7596329	4.579853

lm2ifs		241	3.475336	.5675233	1.395	4.768255
lpoppt		287	7.538636	2.169769	3.660068	12.10049
lcgdppt		266	7.97532	.8557378	5.919313	9.874479
lcppt		266	3.012422	.5056011	1.816452	4.190775
lcipt		266	2.605165	.4542273	1.23489	3.548064

lopencpt		266	4.136916	.7041917	1.838643	5.638412
lrgdplpt		260	8.56624	.5168017	7.436464	9.905133
lrgdpchpt		260	8.567179	.5175717	7.43573	9.90428
lopenkpt		260	4.004836	.7506277	1.979897	5.536862
lkgpt		260	3.057518	.4669452	2.05207	4.209279

lkipt		260	2.513467	.46722	1.032472	3.420608
lehiitex		142	3.821731	.0704545	3.640598	4.024913
lginids		49	3.98344	.0992026	3.734416	4.135167
lschool		213	1.399806	.4613755	-.356675	2.209373
ledusec		190	3.52073	.6625182	1.386294	4.523689

letfrac		207	2.852942	1.045384	0	4.219508
lgkf2per		202	6.116037	.8728648	3.275177	8.190376
lgkf2per		188	6.339722	1.553532	2.994685	12.77927
liprivcred		255	3.23398	.639161	.1086247	4.724076
ligdpper2		254	7.705626	.7679064	6.100747	9.717184

ligdpperlcu		262	8.844064	2.522319	2.230064	14.60318
ligdperppp		178	8.525781	.4894844	7.441956	9.742857
ligdppp		178	23.27365	2.179871	19.02414	27.86945
lim2gdp		232	3.340789	.5380404	1.817537	4.555445
lim3gdp		254	3.446656	.5219956	1.862669	4.764765

lliquireser		257	3.168546	3.497264	-2.232346	23.94946
ligdpcpiifs		211	5.396365	4.582127	-6.109084	27.70123
lireprivaifs		188	3.144744	.8013238	1.137345	7.602042
lireprivplu~s		163	3.389833	.7774012	1.197078	7.602042
lirem2ifs		189	3.467902	.6907882	1.503505	7.843476

liprivaiifs		227	3.054535	.707397	.3508744	4.55865
liprivplus~s		196	3.285493	.667752	.8072743	4.55865
lim2ifs		228	3.414035	.58299	1.279054	4.778965
licgdpt		266	7.872444	.8797933	5.857247	9.856817
lirgdplpt		260	8.531859	.5227025	7.449603	9.93505

lirgdpcchpt		260	8.533011	.5237702	7.44704	9.931883

Source: Author's own preparation based on STATA output

Annex 2.7: Finance and inequality: Cross-sectional estimations (Gini, WDI)

Variable	Regr. 1	Regr. 2	Regr.3	Regr.4	Regr.5	Regr.6	Regr. 7	Regr. 8
Constant	5.61** (.00)	5.65**	5.81**	5.36**	5.41**	5.31**	5.46**	5.01**
Ln(privatecredit1)	0.123* (.04)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
Ln(privateCredit2)				0.09* (.04)		0.08+ (.06)		0.09* (.04)
Ln (M2/GDP)		0.06* (.04)			0.05* (.03)		0.04 (.51)	
			0.03 (.39)					
Control Var.								
Ln(Initial GDP)	-0.066 (.33)	-0.059 (.36)	-0.08 (.25)					
ModernSector/GDP	-0.006* (.03)	-0.006* (.04)	-0.005 (.12)	-0.009** (.00)	-0.008** (.00)	-0.009** (.00)	-0.008* (.02)	-0.01** (.00)
Ethno	-0.0001 (.87)	-0.0004 (.61)	-0.0002 (.78)					
Ln(schoolingYears)	-0.012 (.86)	-0.017 (.81)	0.017 (.83)					
Ln(GovExpenditure)	-0.023 (.75)	-0.013 (.86)	0.034 (.67)					
Inflation	-0.028+ (.07)	-0.025 (.12)	-0.03 (.07)	-0.020* (.02)	-0.026* (.03)	-0.023* (.03)	-0.03 (.18)	
Ln(TradeOpenness)	-0.204** (.00)	-0.18** (.00)	-0.23** (.00)	-0.21** (.00)	-0.199** (.00)	-0.19** (.00)	-0.21** (.00)	-0.14** (.00)
R squared	.74	.74	.66	.67	.68	.67	.59	.57
Adj. R square.	.57	.58	.44	.60	.63	.59	.46	.50
F	4.55	4.66	3.10	9.49	9.81	8.95	4.66	8.37
Prob > F	.00	.00	.03	.00	.00	.00	.01	.00
Number obs.	22	22	22	23	23	23	18	23

Note. The dependent variable is the natural logarithm of the Gini index reported as part of the World Bank Development Indicators. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5% and 10 % level, respectively. Estimated regressions 5 – 8 use the initial value of an alternative financial development indicator.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita (1970)

ModernSector/GDP = Modern Sector Value Added/GDP, value added of service and industrial sectors as share of GDP

Ethno= Ethnological Fractionalization

Ln(schoolYears) = Natural logarithm of the initial average years of school attainment (1970)

Ln(secondaryEdu) = Natural logarithm of the initial mean years of secondary schooling (1970)

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

Inflation = Inflation, consumer prices (annual %)

Ln(TradeOpenness) = Natural logarithm of the sum of exports and imports as a share of GDP

Source: Author's own preparation based on original estimations

Annex 2.8: Finance and inequality: Cross-sectional estimations (Gini, Deininger & Squire)

Variable	Regr. 1	Regr. 2	Regr.3	Regr.4	Regr.5	Regr.6	Regr. 7	Regr. 8	Regr. 9
Constant	5.05** (.00)	4.10** (.00)	4.03** (.00)	4.34** (.00)	4.26** (.00)	4.27** (.00)	4.44** (.00)	4.56** (.00)	4.66** (.00)
Ln(privatecredit1)	0.060 (.44)		0.106 (.11)	0.11+ (.06)			0.021 (.73)		
Ln(privateCredit2)		0.03 (.37)			.043 (.16)			-0.064 (.27)	
Ln (M2/GDP)						0.029 (.46)			-0.11 (.13)
Control Var.									
Ln(Initial GDP)	-0.126 (.35)								
ModernSector/GDP	-0.0001 (.96)	-0.001 (.72)	-0.003 (.34)	-0.006 (.12)	-0.002 (.46)	-0.001 (.65)	-0.004 (.39)	-0.003 (.42)	-0.002 (.49)
Ethno	0.001 (.42)	0.0009 (.46)							
Ln(schoolingYears)	0.01 (.93)	-0.101 (.29)							
Ln(GovExpenditure)	0.09 (.36)	0.103 (.34)							
Inflation	-0.017 (.51)	-0.005 (.83)	0.005 (.77)		0.003 (.88)	-0.0008 (.96)			
Ln(TradeOpenness)	-0.11 (.30)	-0.051 (.51)	-0.03 (.65)	-0.072 (.18)	-0.050 (.50)	-0.061 (.44)	-0.067 (.29)	-0.072 (.37)	-0.065 (.39)
Ln(SecondaryEdu)				0.002 (.17)			-0.002 (.29)	0.004+ (.05)	0.004 (.05)
R squared	.51	.40	0.25	.37	.21	.10	.14	.41	.49
Adj. R squar.	-.02	-.12	-.01	.14	-.07	-.22	-.16	.15	.26
F	0.95	0.75	.95	1.62	0.75	0.31	0.46	1.57	2.08
Prob > F	.53	.63	.47	.23	.58	.86	.76	.26	.15
Number obs.	16	16	16	16	16	16	16	14	14

Note. The dependent variable is the natural logarithm of the Gini index reported in the Deininger & Squire data set. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10 % level, respectively.

Estimated regressions 7 – 9 use the initial value of an alternative financial development indicator.

Ln(privatecredit1) = Natural logarithm of domestic credit to private sector (% of GDP)

Ln(privateCredit2) = Natural logarithm of average of t-1 to t of real private credit to real GDP

Ln(M2/GDP) = Natural logarithm of average of t-1 to t of real M2 to real GDP

Ln(Initial GDP) = Natural logarithm of the initial level of real GDP per capita (1970)

ModernSector/GDP = Modern Sector Value Added/GDP, value added of service and industrial sectors as share of GDP

Ethno = Ethnological Fractionalization

Ln(schoolYears) = Natural logarithm of the initial average years of school attainment (1970)

Ln(secondaryEdu) = Natural logarithm of the initial mean years of secondary schooling (1970)

Ln(GovExpenditure) = Natural logarithm of general government final consumption expenditure (% of GDP)

Inflation = Inflation, consumer prices (annual %)

Ln(TradeOpenness) = Natural logarithm of the sum of exports and imports as a share of GDP

Ln(SecondaryEdu) = Natural logarithm of the initial mean years of secondary schooling

Source: Author's own preparation based on original estimations

Annex 2.10: Correlation Matrix (Panel dataset)

	privcred	xgdp	gov	giniwb	gkf	gkfk	infla	inflagdp	m3gdp	induserva	m2gdp	open	popgr	xgrowth	fdigdp	debsergdp	tradegdp	reprivaits	reprivplusits	rem2ifs	privaits	GDPper	govPWT	openkpt	GrowthGDP	ehiitex	ginids	School	Edusec	dleg	dinc1	dinc2	etfrac	long	lat			
privcred	1																																					
xgdp	0.49885991	1																																				
gov	0.41224238	0.492	1																																			
giniwb	0.25467995	-0.11	0.07	1																																		
gkf	0.33962147	0.443	0.32	-0.08	1																																	
gkfk	0.3634377	0.437	0.33	-0.14	0.965	1																																
infla	-0.06175561	-0.18	0.13	-0.01	-0.08	-0.07	1																															
inflagdp	-0.06214369	-0.16	0.13	2E-04	-0.08	-0.07	1	1																														
m3gdp	0.73202615	0.631	0.68	-0.12	0.469	0.48	-0	-0.049	1																													
induserva	0.09052891	0.02	0.02	-0.19	-0.06	-0.06	0.1	0.0718	-0.0276	1																												
m2gdp	0.72792247	0.642	0.66	-0.12	0.471	0.49	-0	-0.126	0.97612	-0.06762	1																											
open	0.43855255	0.935	0.54	-0.24	0.535	0.55	-0	-0.138	0.65762	-0.06244	0.6725	1																										
popgr	-0.30177221	-0.46	-0.51	0.282	-0.32	-0.37	0	0.0359	-0.5891	-0.1358	-0.58	-0.5	1																									
xgrowth	-0.10125585	-0.04	-0.23	-0.05	0.044	0.05	-0	-0.043	-0.2021	0.0267	-0.186	-0	0.063	1																								
fdigdp	0.46788976	0.443	0.29	-0.06	0.585	0.63	-0	-0.128	0.51266	-0.03117	0.576	0.52	-0.352	0.0864	1																							
debsergdp	0.17417158	0.378	0.22	-0.14	0.251	0.3	-0	-0.04	0.2478	0.15605	0.2627	0.35	-0.18	0.0758	0.104	1																						
tradegdp	0.49015076	0.976	0.53	-0.12	0.488	0.48	-0	-0.138	0.66894	-0.08703	0.6878	0.97	-0.487	-0.076	0.503	0.2372412	1																					
reprivaits	0.08203409	0.064	-0.02	0.111	-0.03	-0.06	-0	-0.043	0.01179	-0.03192	0.0384	0.01	0.038	-0.094	0.03	-0.0376052	0.0661	1																				
reprivplusifs	0.10821163	0.08	-0	0.129	-0.01	-0.04	-0	-0.041	0.02481	0.00381	0.0478	0.01	0.054	-0.056	0.014	-0.0443872	0.07985	0.9976937	1																			
rem2ifs	0.05667604	0.064	0.01	0.076	0.011	-0.02	-0	-0.051	0.04418	-0.04809	0.0676	0.03	0.015	-0.091	0.072	-0.0353988	0.07453	0.9711795	0.97935916	1																		
privaits	0.92410376	0.513	0.48	0.224	0.447	0.46	-0	-0.057	0.74088	0.05849	0.7596	0.47	-0.379	-0.082	0.536	0.2209243	0.50894	0.1044871	0.12668637	0.082263	1																	
GDPpercap	0.5555092	0.316	0.24	-0.02	0.158	0.22	-0	-0.022	0.49462	0.36377	0.4878	0.25	-0.322	-0.085	0.261	0.2096369	0.22946	0.0040584	0.01968799	-0.006306	0.49792	1																
GovPWT	0.39572895	0.459	0.72	-0.09	0.503	0.54	0.1	0.0752	0.6177	-0.02603	0.624	0.57	-0.481	-0.073	0.306	0.3536463	0.50276	0.0055854	0.01517533	0.034478	0.479	0.14997	1															
openkpt	0.5524251	0.901	0.54	-0.07	0.452	0.46	-0	-0.167	0.61556	-0.05487	0.6442	0.9	-0.402	-0.081	0.456	0.3313374	0.92324	0.0723926	0.08015387	0.061663	0.5754	0.24492	0.50842	1														
GrowthGDP	0.02454121	0.211	0.01	0.092	0.283	0.3	-0	-0.254	0.01955	-0.01784	0.0546	0.22	-0.137	0.3308	0.262	0.1306202	0.18929	-0.012277	-0.00511526	0.000389	0.08513	-0.0279	0.08032	0.214645	1													
ehiitex	0.07947959	0.142	-0.12	-0.01	-0.01	-0.02	0	-6E-04	0.07826	0.04661	0.0917	0.12	-0.167	-0.071	0.295	-0.0847721	0.22196	-0.0464553	-0.07482965	-0.086487	0.05115	0.08791	-0.00478	0.19226	-0.04100007	1												
ginids	0.37847682	-0.09	0.28	0.569	-0.06	-0.09	0	0.0285	-0.0236	-0.11604	0.0282	-0.2	-0.333	0.0668	0.19	0.0871362	-0.07004	0.114596	0.11982279	0.072604	0.44838	-0.0703	0.4649	0.07696	0.15333067	0.43449	1											
School	0.47366568	0.388	0.3	-0.15	0.173	0.16	-0	-0.006	0.49766	0.45571	0.5085	0.31	-0.589	-0.02	0.321	0.1488376	0.34734	-0.0041897	0.00076624	-0.014942	0.55738	0.7649	0.0808	0.281713	-0.01655829	-0.04626	-0.09511	1										
Edusec	0.51791236	0.46	0.41	-0.27	0.293	0.34	0.1	0.0521	0.64688	0.46353	0.6079	0.42	-0.607	-0.02	0.289	0.4013577	0.43471	-0.0330994	0.01438683	-0.045085	0.56067	0.73869	0.30269	0.319943	-0.12076314	0.11548	0.17562	0.8249	1									
dleg	0.43362236	0.725	0.48	-0.47	0.462	0.52	-0	-0.132	0.62705	-0.04537	0.6372	0.8	-0.529	-0.064	0.441	0.2507247	0.74171	-0.0344001	-0.03142995	-0.002824	0.47335	0.30241	0.53039	0.676552	0.1402628	0.26147	0.1121	0.27214	0.46750268	1								
dinc1	-0.34249124	-0.21	-0.17	0.216	-0.16	-0.22	0	0.0098	-0.2864	-0.06003	-0.299	-0.2	0.292	-0.039	-0.219	-0.1207353	-0.17288	-0.0501155	-0.07719753	-0.058083	-0.42332	-0.361	-0.20122	-0.26751	-0.0677769	0.25913	0.46891	-0.3587	-0.27500349	-0.29	1							
dinc2	0.43940038	0.306	0.2	-0.2	0.238	0.25	-0	-0.114	0.35686	0.07348	0.367	0.25	-0.352	0.0379	0.278	0.1556076	0.24503	0.0598307	0.08332564	0.066237	0.50834	0.42953	0.17945	0.348125	0.12623715	-0.20543	-0.46891	0.567	0.42789855	0.387	-0.882	1						
etfrac	-0.10188698	0.183	0.07	-0.06	0.014	-0.01	0.1	0.0541	0.04908	-0.05304	0.0709	0.17	-0.1	-0.09	0.178	0.1131327	0.16099	0.0555466	0.0721306	0.042628	0.04155	-0.0248	0.03606	0.066635	-0.01868357	0.25042	0.2104	0.15078	0.13884973	0.189	0.217	-0.081	1					
long	0.18912604	0.202	0.34	0.04	0.24	0.29	0	-4E-04	0.31361	-0.00128	0.2681	0.23	-0.528	-0.047	0.23	0.1231803	0.18408	-0.0577299	-0.09754763	-0.044875	0.29903	0.16468	0.29062	0.111389	0.15350959	0.01636	0.25057	0.35051	0.2511336	0.299	-0.137	0.2233	-0.04	1				
lat	0.16077718	0.437	0.21	-0.12	0.193	0.2	-0	-0.128	0.29479	-0.08837	0.322	0.47	-0.021	-0.04	0.179	0.1209595	0.45997	0.0301401	0.08045062	0.056237	0.0677	0.03345	0.22321	0.494659	0.04779228	0.19718	-0.38275	-0.3631	-0.12249239	0.465	-0.095	0.0145	-0.106	-0.4	1			
dinc	0.45924247	0.343	0.22	-0.2	0.245	0.26	-0	-0.127	0.36311	0.05956	0.3815	0.29	-0.302	0.0402	0.271	0.1422239	0.28755	0.0548852	0.07844974	0.061022	0.52677	0.42768	0.22683	0.37823	0.13553162	-0.19878	-0.46891	0.567	0.41655787	0.469	-0.813	0.9393	-0.081	0.133	0.06			

Source: Author's own preparation on basis of data analysis

Chapter 3

Access to finance, growth, and poverty: An empirical analysis for Bolivia¹

Abstract

In theoretical and empirical terms it has been recognized that well-functioning financial systems are essential for economic growth and poverty reduction. Most of this empirical evidence has focused on financial development as reflected in the depth and efficiency of the financial systems. However, it is important to consider that financial development does not necessarily mean that finance is available for all on an equal basis. Access to finance has received little attention in empirical literature, despite the emphasis it has received in theory and the various recent efforts to measure it. Additionally, recent studies related to the pro-growth role of finance have revealed the need for more empirical knowledge at regional and single country levels.

The present study briefly reviews recent literature related to the issue of access to finance and its effects on growth and poverty. Additionally, given the economic and social peculiarities of Bolivia and the need for country case evidence, the finance-growth and finance-poverty relationships are examined for this country, with an emphasis on the access dimension of finance. With this purpose, after a contextual analysis of the Bolivian financial intermediation, a cross-sectional study at a sub-national level was executed covering data of proxies of access to finance, economic growth, poverty, and other control variables for Bolivian municipalities. The main findings suggest that access to finance is an important factor spurring economic growth and poverty reduction in Bolivia. The results are robust for different measures of financial access and control variables. Additionally, microfinance institutions (MFIs) seem to have a part in the promotion of growth and in poverty alleviation. Among these MFIs, it is worth emphasizing the role of nongovernmental organizations (NGOs) and other semiformal institutions reaching rural and/or “really” poor agents. Moreover, the Bolivian experience in terms of microfinance and the evolution of the financial system in two different scenarios (financial repression and financial liberalization) suggests that the role of the government in building an effective and accessible financial system should focus on regulation and on promoting the supply of financial services rather than on ownership.

¹ An earlier version of this chapter was presented at the 12th Annual Global Development Conference that took place in Bogota, Colombia on 14-16 January 2011 and was organized by the Global Development Network. At this conference the study was also awarded second place in the Global Development Medals Competition 2010.

3.1 Introduction

Most of the empirical research until now on the issue of the effects of finance has focused mainly on its depth, efficiency, and stability. Several econometric studies applying cross-sectional, time series, and panel techniques have concluded that financial depth (as an indicator of financial development) is pro-growth and pro-poor. Therefore, in economies with better developed financial systems, one can expect faster drops in income inequality and faster reductions in poverty levels. However, we have to take into account that even well-developed (deep) financial systems may offer limited access to financial services.

In this respect, modern growth theories increasingly emphasize the key role of financial access. Limited access to finance is often the critical mechanism for generating persistent poverty, income inequality, and slower growth. However, despite the emphasis that financial market imperfections have received in theory, development economists often take them as given and focus their attention on redistributive and social policies to reduce poverty and inequality in income distribution. Yet the tasks of redistribution and poverty alleviation may have to be endlessly repeated if financial market frictions are not faced. These market imperfections such as information asymmetries and transaction costs are likely to limit the opportunities of the talented poor, and of the micro and small enterprises, which lack collateral, credit histories, and connections (Beck, Demirgüç-Kunt, & Honohan, 2008a).

Access to financial services is a fundamental aspect in economic development and social welfare. On the one hand, such services give households a tool to save and get credit, which allows them to better manage their inter-temporal spending needs for things such as durable goods, property, their children's education, or retirement. In the case of firms, access to credit is important to financing working capital and investment. Moreover, households and firms need insurance products to manage unforeseeable events at a reasonable cost. Additionally, access to payment technologies through credit or debit cards, checking accounts, and electronic transfers, among other mechanisms, is essential to facilitating transactions by saving time and improving the security of the transactions (CAF, 2011).

Limited access to finance, even in a scenario of a well-developed financial system, will diminish the benefit of financial development for many households and firms, leaving much of them in poverty. Therefore, financial sector policies that promote competition, give the right incentives to individuals, and help remove financial barriers will lead to growth, inequality reduction, and poverty alleviation (Beck, Demirgüç-Kunt, & Honohan, 2008c).

There is no doubt that interest in financial access has augmented significantly in recent years, as empirical evidence proposes that a lack of access to finance would limit economic growth and poverty alleviation². This interest also comes from the fact that arguments about the channels through which financial development may give rise to economic growth usually incorporate access-related stories. For example, with regard to the Schumpeterian argument that financial development causes growth because it stimulates the process of "creative destruction" by allocating resources to efficient uses, what is relevant in this argument is the finance access dimension.

Another reason explaining the increasing interest and importance of access to finance is the limited access to financial services in developing countries, particularly when we compare it with developed countries. With this respect, recent World Bank studies show that more than 70% of the Latin American population lacks financial access, while only about 20% of the population in developed economies is financially constrained (De la Torre, Gozzi, & Schmukler, 2006). An important issue that should be considered when referring to access to finance is the microfinance system. Microfinance in

² Mainly because lack of access to credit stops lower income households and small firms from engaging in true high-return investment projects.

the sense of access to finance will imply the increased availability of financial services for low-income individuals. The emergence and growth of the microfinance sector has changed attitudes toward helping the poor. In some countries, microfinance institutions (MFIs) have provided substantial flows of credit, often to very low-income groups or households, who would normally be excluded by conventional financial institutions. However, among the academic development community there is recognition that we still know little about the impact of microfinance in terms of growth and poverty alleviation (Weiss, 2005).

Despite the importance of the access dimension of finance, there is a relative absence of empirical research on this issue. Most of the research on finance and its relation to growth and poverty rely on indicators and data that measure financial development. One important reason for this fact relates to the scarcity and lack of datasets reflecting this dimension of finance. Specifically, in the last 7 years significant attention has been put on financial access measurement and the building of cross-country datasets. Exploring the concept has been one of the first and most challenging tasks of most of the measurement studies.

Indeed, looking for indicators of financial access is not an easy task, and not only because of data availability limitations but also because of some theoretical misconceptions. In fact, even some recent literature (i.e. CGAP & World Bank, 2009 and 2010) has ignored or understated the distinction between access to finance and use of finance³. Access essentially refers to the supply of services, whereas use is determined by demand as well as supply. To show the difference between access and use, one should realize that even wealthy customers in advanced financial systems might choose not to use some financial services. So, non-use cannot be attributed to a problem of access (Beck et al., 2008c).

Less limited access to finance means an absence of price and non-price barriers in the use of financial services. These services need to be available when and where desired, and products have to be shaped according to specific necessities. Additionally, they need to be convenient in terms of the indirect costs incurred by the user, such as having to travel a long distance to a deposit institution (Beck et al., 2008c).

The attempts to measure these aspects involved in access to finance are recent and have significant limitations. One of these limitations is that they do not take into account the financial services supplied by non-bank deposit institutions when measuring access to finance. In this sense, it is important to take into consideration that non-bank deposit institutions account for a significant share of the financial system of some countries (i.e. Bolivia). In other cases, some cross-country data sets such as that of the IMF (2013), while acknowledging the role of non-bank deposit institutions, do not have data about these non-bank institutions. Among these non-bank financial institutions, in the case of Bolivia, one can think of formal institutions such as credit unions, savings and loan mutuals, and private financial funds, but also semiformal institutions such as non-governmental organizations (NGOs).

In this last respect, one recent work highlighting the importance of NGOs in terms of access to finance is that by Cull, Morduch, and Demirgüç-Kunt (2009). In their study, related to microfinance, they show that around 45% of the branches of microfinance institutions are NGOs. Additionally, Cull et al. (2009) reveal that despite NGOs accounting for only around 21% in terms of assets, they reach many more

³ In the study of De la Torre et al. (2006), this distinction is mentioned in terms of a problem of access and a lack of access. On the one hand, a *problem of access* to credit exists when a project that would be internally financed if resources were available does not get external financing (from outside financiers). This happens because there is a wedge between the expected internal rate of return of the project (which is generated by the project's fundamentals) and the rate of return that external investors require to finance it. This wedge is mainly introduced by two well-known constraints that hamper the ability to write and enforce financial contracts, namely, *principal-agent problems* and *transaction costs*. On the other hand, a *lack of access* is simply the fact that financial services are not being used.

borrowers than microfinance banks. NGOs are serving around 50% of the borrowers, while only around 25% are served by microfinance banks. On average, NGOs make loans that are about four times smaller than microfinance banks, suggesting that NGOs are serving a poorer group of borrowers.

A weak point of most of these empirical studies on finance and growth is that they rely excessively on general evidence.⁴ This points to the need for complementing cross-country econometric analysis with more broad-based empirical evidence derived from regional and country case studies. Having already presented the need for empirical evidence for the Latin American and Caribbean region, our focus in the present chapter is on a single country study.

Although it would seem that a single country study could offer no heterogeneity, we should note that within a country there are important differences at the sub-national level (i.e. provinces or municipalities) and across time (provinces or municipalities today and in past periods). Therefore, there is the possibility to exploit (depending on data availability) both or any of these dimensions of variation. *“Sub-national variation among administrative units is the most easily available strategy to practitioners of single country studies, and it has the great virtue of holding many other potentially causal variables constant”* (Culpepper, 2005, p. 2).

Based on the empirical evidence presented earlier, finance seems to be an important factor promoting growth and reducing income inequality in the Latin American and Caribbean region.⁵ However, it is important to take into account that when evaluating the role of finance on growth and inequality in the mentioned region, the available cross data and proxies on finance were referring to financial development. In this sense, as we stated above, it is important to note that financial development does not necessarily mean that finance is available for all on an equal basis. It is possible that finance can be allocated in a skewed or even perverse manner, so that not all would have a fair chance at getting their projects financed (Claessens, 2005).

Therefore, it is necessary to complement our previous research by considering now the dimension of access to finance. However, as we already mentioned, this dimension has been overlooked, mostly because of serious data gaps. In fact, the collection and systematization of data across countries is a task that has only recently started. This provides even greater incentive to carry out a country case study.

With regard to some of the main economic and social indicators of our country case study, Bolivia is classified as a lower middle-income country by the World Bank. At a regional level, the country is considered as one of the poorest in Latin America. In fact, 51% of the population in 2009 were considered to be living under the poverty line. Very closed related with this fact, the GINI coefficient reveals that Bolivia presents one of the highest levels of income inequality in the region. The averaged GDP growth for the period 1999-2009 has been 3.4%, a percentage that is low in comparison with other developing countries in Latin America and Asia (World Bank, 2013).

Furthermore, considering the issue of the access to finance, Bolivia could be considered as one of the most restricted in the region. In fact, available cross-sectional data on indicators of banking outreach (Beck et al., 2007b) shows Bolivia occupying one of the last positions among a sample of 18 Latin American and Caribbean countries (out of 35 in all). This available data refers to indicators of bank geographic penetration (number of bank branches per 1,000 square km and number of bank ATMs per 1,000 square km) and measures of bank demographic penetration (number of bank branches per 100,000 people and number of bank ATMs per 100,000 people). A very recent data set launched by the World Bank in 2012⁶ about financial inclusion indicators shows similar figures. Bolivia appears to

⁴ For more on this issue please refer to Chapter 2, Does financial development lead to economic growth and reduce inequality in Latin America and the Caribbean?

⁵ Ibid.

⁶ See Global Financial Inclusion (Global Findex) Database and Global Financial Development database.

be one of the countries with the most restricted financial access among a sample of 24 Latin American and Caribbean countries⁷.

However, it must be considered that in the case of Bolivia, the non-bank deposit institutions (formal and semiformal) have significant geographical coverage both in urban and rural areas. In addition, they have a high share in terms of number of clients (around 50% of the total of deposit institutions), loan portfolio, and deposits (around 25% of the total of deposit institutions). Therefore, when considering the issue of financial access in Bolivia, it is important to take into account the role of these non-bank financial institutions.

In this respect, very recent literature highlights the importance of considering the role of other major constituents of a country's financial system apart from bank institutions. Among this recent and novel research is the study of Majerbi (2010), which examines the impact of the overall structure of the financial system and its degree of institutional diversification on economic growth. Majerbi (2010) suggests that a well-diversified financial system will have a positive impact on economic growth since economic agents will have access to various alternative and competitive sources of financing. The importance of a competitive and diverse financial sector is also highlighted by the World Bank (2014) in its Global Financial Development Report,

Additionally, another particular characteristic of Bolivian financial intermediation that should be highlighted is the emergence and rapid increase of the microfinance sector. In fact, Bolivia is a unique and fascinating case of microfinance advancing far within a short time. Moreover, its rapid growth has been accompanied by the development of the ability and willingness of the microfinance institutions to serve the poor on a commercial basis. The commercialization of microfinance has advanced to such a point in Bolivia that this sector is no longer primarily donor-driven (Rhyne, 2001). It seems that the regulatory environment has played an important role for Bolivian microfinance success, since it is considered as one of the best for microfinance at the regional and world level (Hanning, 2011).

Given the previous considerations, the main goal of the present study is to analyze the finance–economic growth and finance–poverty relationships for the case of Bolivia, focusing on the access dimension of finance. With that purpose, theoretical and empirical studies relating to access to finance and country case studies on the effects of finance on growth and social fairness were reviewed. Additionally, considering the economic and social characteristics of Bolivia, we approach empirically both relationships for the case of this country.

Although inequality and poverty are both relevant and different aspects of social fairness, in the present chapter we stress the impact of finance on poverty. An important reason to focus on it is the fact that the Bolivian financial system is characterized by the existence of a prosperous microfinance sector, considered a leader at even the world level. In this sense, microfinance seems to be a reflection of financial services reaching low income individuals.

Microfinance in Bolivia presents an image of the poor and the informal sector as economic actors. This image is relevant for conceptualizing approaches to poverty. The poor participate actively in their betterment. They are not passive recipients of assistance, not simply refugees from a failed formal sector, but economic actors out to improve the quality of their lives, and as such, they are potential contributors to economic growth. (Rhyne, 2001, p. 216).

Additionally, other factors such as availability and quality of data at a sub-national level have also influenced our poverty aspect choice.

The empirical work is based on a contextual analysis of the Bolivian financial system and a cross-sectional econometric study at a sub-national level. The econometric analysis is executed covering

⁷ The measure of access to finance is the number of commercial bank branches per 100,000 adults.

data of proxies of access to finance, economic growth, poverty, and other control variables for Bolivian municipalities (around 300). Available international financial access datasets are cross-country, and since they are recent, they cover a maximum 8 years of data. Additionally, as we already noted, one important limitation of them when measuring access to finance is that they do not have information about the financial services supplied by deposit non-bank institutions. Precisely, one of the novelties of the present study is the consideration of such financial institutions since they account for a significant share of the Bolivian financial system.

Apart from the significant increase in the number of observations (which is desirable for econometric analyses), it is possible that evaluating the role of finance at the sub-national level could bring us closer to the Bolivian case than considering the country as a whole. Despite the fact that the Bolivian political system is unitary rather than federal, it is evident that there are important within-country differences. Departments, provinces, and municipalities in Bolivia are quite heterogeneous regarding economic and social performance and also their institutions. We cannot even assume that there is a homogenous culture across the country, since there are important regional variations within Bolivia.

Additionally, although growth theories seem more proper to be approached at a macro level (through pure cross-country and panel data analyses), the sub-national level approach could be an option. Thus such theories originally focused on a national case could be tested in subunits (i.e. municipalities) of the national case. Cross-country and country panel studies aim to explain macro growth differences across countries on the basis of structural, institutional, and economic determinants. Within a single country case at a sub-national level, some growth conditions do not hold the same as they do across countries. For example, at a sub-national level the legal system is the same, capital and population mobility is much higher within a country than across countries, and government policies can influence growth and social fairness. However, we should note that there will be some conditions that are reflected both at the macro and sub-national level.

First, the convergence hypothesis (which is central in the growth literature) would be true not only at a macro level but then also at a sub-country level. Following the absolute (neoclassical) convergence approach, poor regions would tend to grow faster than relatively richer ones, which does not seem likely at the municipality level since local growth would follow some spatial patterns. For the modern growth theories, different countries should be described by distinct aggregate production functions, which means that the assumption of the same convergence rate for every country is not realistic. Precisely, this last hypothesis seems more probable not only at a macro level but also at a local level, since economic growth at a municipality level may be affected by spatial dependence and spatial heterogeneity⁸ (Rodríguez-Gámez & Rodríguez-López, 2013).

Second, recent theoretical approaches to cross country and cross region differences emphasize in the efficiency of production and human capital as potential determinants of income per capita in both national and local economies. Efficiency in production and human capital of the workforce will differ at national and sub-national levels mainly due to institutions (national and local).

Local institutions influence how local and regional collective decisions are made; how lower levels of government interact with the national government, and how political power is distributed at the local level. Through these channels, local institutions impact important determinants of the efficiency of production, such as the provision of local public goods and the security of local property rights. At the country level, productive efficiency is determined by the average of local institutions, by national institutions, and by the technology adoption and use decisions of profit-maximizing firms. A country where local institutions in several regions create

⁸ "Spatial dependence occurs when the growth rate at one location depends on the values of observations at other locations; while spatial heterogeneity, on the other hand, occurs when parameters in growth models vary across countries or regions depending on their location" (Rodríguez-Gámez & Rodríguez-López, 2013, p.2).

inefficiencies will exhibit not only within-country differences, but also lower national income. Aggregate output is lowered directly, due to the presence of these low income regions, and indirectly, because low demand from poorer regions will lead to a smaller market size for new technologies, discouraging technology adoption at the national level (Dell & Acemoglu, 2009, p. 2).

Therefore, if we extend the statement above, it is possible that a country where several regions exhibit a low supply of financial services would not only give rise to socio-economic differences across regions, but also would impact national growth and poverty. Under this logic, our sub-national level analysis would have implications at the macro level.

Our main findings suggest that access to finance is a factor spurring economic growth and poverty reduction in Bolivia. Additionally, the role of microfinance institutions is highlighted, showing the importance of MFIs in promoting growth and alleviating poverty. Among these MFIs, it is worth emphasizing the role of semiformal institutions such as nongovernmental organizations (NGOs⁹).

The rest of the study is organized as follows. Section 2 presents the most important theoretical and empirical considerations relating to our object of study. Section 3 shows some characteristics of the Bolivian financial system, with an emphasis on its structure and its transformation from a financial repression scenario to a liberalization scheme. In addition, given the particularities of the Bolivian experience in terms of microfinance and its close relation with the issue of access to finance, in this section we also refer to the Bolivian microfinance sector. After that we present some data and trends regarding access to finance in Bolivia. Section 5 lays out the methodology and main data elements of our study. Next, we develop our own empirical evidence on the relationships between access to finance and growth and between access to finance and poverty for the case of Bolivia. Finally, we summarize the conclusions in Section 7.

3.2 Theoretical and Empirical Considerations

The increasing importance of access to finance

Over the last two decades, access to finance has received more attention and has become a more relevant issue on the development agenda. Claessens (2005) makes reference to some reasons explaining this fact. The first one is related to the theoretical and empirical works showing that finance is an important growth factor. The second reason is that due to changes in economies and economic production, finance may have moved up in the ranking of barriers to growth. Additionally, another explanation is the increasing perception that households and enterprises have had limited access to finance.

Among the main constraints that prevent poor households and small enterprises from using financial services is geography or physical access.

“While well-off customers may be able to access some services over the phone, or via the Internet, others require clients to visit a branch, or use an ATM. Ideally, we would like to know how far customers are from the location of the nearest branch (or ATM); the density of branches per square kilometer, or per capita, provide an initial, albeit crude, alternative indicator. For example, Spain has 96 branches per 100,000 people, and 790 branches per 10,000 sq km, Ethiopia has less than one branch per 100,000 people, while Botswana has one branch per 10,000 sq km.” (Beck et al., 2008a, p. 9).

Another important obstacle is the lack of the documents and other requirements necessary to open an account or to request credit, since financial institutions will require from their customers, at a

⁹ These financial non-governmental organizations have since 2010 been referred to as “Development Financial Institutions.”

minimum, identification documents. In many developing countries, many people do not even have such papers, mainly because they are not employed or do not have their business in the formal sector. Additionally, many institutions have minimum account size requirements¹⁰, fees that are out of the reach of many, or specific collateral requirements (i.e. mortgages).

These financial access barriers vary considerably across countries. Usually lower barriers tend to be associated with more open and competitive financial systems characterized by private ownership of financial institutions and foreign participation; stronger legal, information, and physical infrastructures; regulatory and supervisory approaches that rely more heavily on market discipline; and greater transparency and freedom for the media (Beck et al., 2008a).

The finance and growth nexus

Patrick (1966) labels three possible hypotheses regarding the finance-growth nexus. These are: the supply-leading, the demand-following, and the stage of development hypotheses. The supply-leading hypothesis states a causal relationship from finance to economic growth, while the demand-following hypothesis postulates a causal relationship from economic growth to finance. So based on this second hypothesis, finance does not affect economic growth; instead, economic growth gives rise to an increasing demand for financial services that might induce an expansion in the financial sector. In the case of the stage of development hypothesis, supply-leading financial development can induce real capital formation in the early stages of economic growth. Innovation and development of new financial services lead to new opportunities for investors and savers and, in so doing, inaugurate self-sustained economic growth. As financial and economic development proceeds, the supply-leading characteristics of financial development diminish gradually and are eventually dominated by demand-following financial development (Calderon & Liu, 2005).

The finance and poverty nexus

Finance could contribute to poverty reduction through several channels. First and foremost, finance helps through economic growth, thus raising overall income levels and consequently increasing the welfare of all¹¹. Specifically, finance could also help reduce poverty by distributing opportunities more fairly. These links between growth and poverty have received much attention in recent years. Theoretical and empirical studies such as the ones of Deininger and Squire (1996), Dollar and Kraay (2000), and Lopez (2004) suggest that growth is beneficial for the poor (Jalilian & Kirkpatrick, 2002).

Besides, there is empirical evidence such as that in Beck, Demirgüç-Kunt and Levine (2004a & 2005) that finance matters, especially for poor households and smaller firms. Recent international cross-country evidence presented by Honohan (2004a & 2004b), Guillaumont and Kpodar (2008), and Ordoñez (2012) reveals the positive effect of financial deepening on poverty reduction. Additionally, Beck et al. (2007a) show that financial development disproportionately boosts incomes of the poorest quintile and reduces income inequality. Furthermore, in the same study, financial development appears associated with a drop in the fraction of the population living on less than one dollar a day.

However, even if financial development in general seems beneficial for growth and poverty, this does not necessarily mean that finance is available on an equal basis. On the contrary, finance could be allocated in a skewed or even perverse manner. In this sense, there is the perception that in developing countries finance often benefits the few.

¹⁰ For example, in some African countries, banks require as a minimum deposit an equivalent to 50% of that country's per capita GDP to open a checking account (Beck et al., 2008c).

¹¹ Countries that have historically experienced the greatest reduction in poverty are those that have experienced prolonged periods of sustained economic growth. In fact, there is plenty of evidence suggesting that the poor typically do share in rising aggregate income and do suffer from economic contractions (Lopez, 2004).

A fundamental cause of poverty is market failure, and financial market imperfections often prevent the poor from borrowing against future earnings to invest. If the causes of financial market frictions (such as asymmetric information and high lending costs) are addressed, it is possible to improve the chances of the poor to access formal financial services. As a consequence of a more inclusive financial system, the poor would increase their productivity and raise the potential for fulfilling sustainable livelihoods (Jalilian & Kirkpatrick, 2004).

In most developing countries, formal financial markets serve only a small percentage of the populations, often no more than 20-30%. Most households do not have access to even basic financial services, and a majority of these households who do not have access are concentrated in low-income categories. To be sure, financial access is not a magic or unique solution against poverty, but there is a conviction that it could play a potentially significant role in poverty alleviation. Like the rich, poor households can benefit from credit, savings, payment, insurance services, and money transfer facilities. Such services help the poor manage their risks, smooth consumption, take advantage of profitable economic opportunities, build income earning and other assets, and therefore improve their standards of living (Nimal, 2008).

The necessity of empirical research on access to finance

As shown previously, much empirical evidence – based on datasets that pool developed and/or developing countries – refers to a significant and robust relationship between financial development and growth.¹³ However, we have to recognize that the connection between the theoretical models and empirical evidence has not been strong. In fact, while theoretical models focus on the importance of access to finance, most empirical studies stress the outcomes of financial development. A main reason explaining this fact relates to the lack and limitations of data on the access dimension of finance.

3.2.1 The challenge of measuring access to finance

The first attempts

One of the pioneering attempts relating to the measure of access to finance is reflected in the work of Beck et al. (2007b). The authors present a consistent dataset of cross-country indicators of banking sector outreach, collected through a survey of bank regulatory agencies conducted in 2003-2004 and complemented with publicly available data¹⁴. This work can be regarded as the first compilation and analysis of consistent and comparable cross-country data on the outreach or penetration of banking systems.

Beck et al. (2007b) stress that broad financial access is the key to development, and this importance is justified by three main arguments. The first one refers to theoretical and empirical finance and growth literature that points to financial development as a factor spurring growth and reducing income inequality and poverty. Financial market imperfections are particularly binding on poor or small entrepreneurs who lack collateral, credit histories, and connections. Lack of access to finance will make it difficult for poor households or small entrepreneurs to finance high-return investment projects (i.e. education, business), reducing the efficiency of resource allocation and having adverse implications for growth and social fairness. A second argument emphasizes that one of the channels through which financial development leads to economic growth and inequality is by means of the entry of new firms (Klapper, Laeven, & Rajan, 2004)¹⁵ and the Schumpeterian process of “creative destruction.” This assumes that talented newcomers have access to the necessary financial services,

¹³ For more on this issue please see Chapter 2: Does financial development lead to economic growth and reduce inequality in Latin America and the Caribbean?

¹⁴ The indicators are available for around 100 countries, including developed and developing countries.

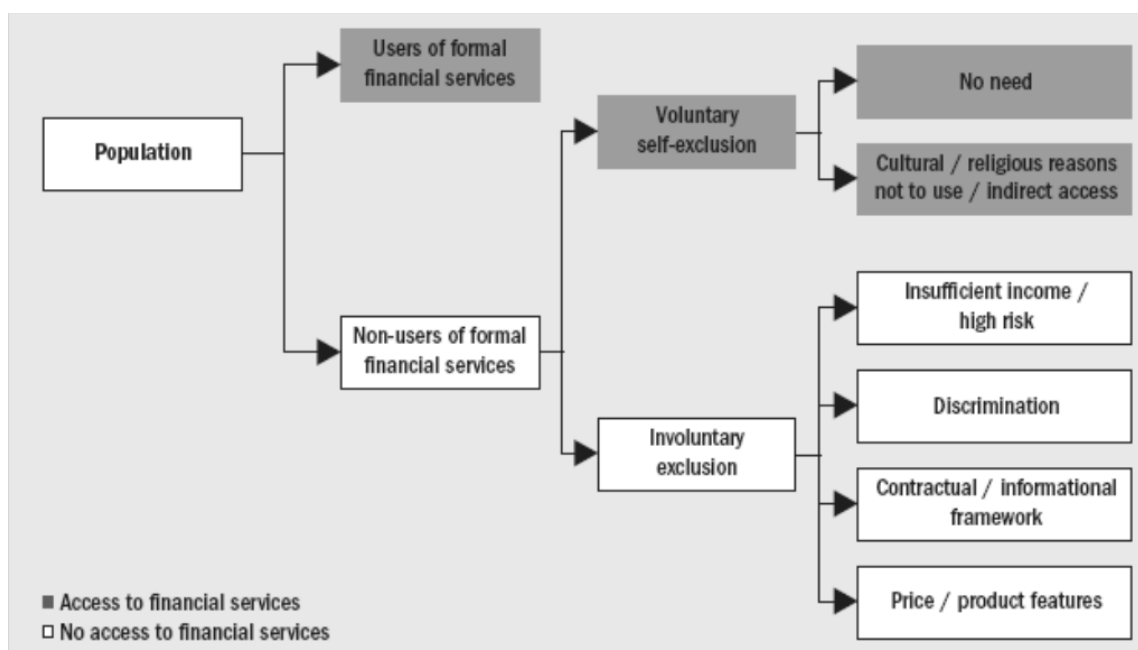
¹⁵ As cited in Beck et al. (2007b).

including external finance. However, considering that these talented newcomers are not necessarily rich or well-connected to financial intermediaries, access to finance is a crucial factor in expanding opportunities (Rajan and Zingales, 2003)¹⁶. The third argument is more socio-political and considers access to finance on a similar level as access to basic needs such as safe water, health services, and education (Peachey & Roe, 2004)¹⁷.

The difference between access and use

The work of Beck et al. (2007b) also establishes an important difference between access to financial services and use of financial services. Access to finance implies an absence of barriers; therefore, economic agents might have access to financial services but decide not to use them, either for socio-cultural reasons or because opportunity costs are too high. In fact, the authors introduce two classes of indicators that correspond to the different concepts of access to and use of financial services. On the one hand, they present data on the number of bank branches and ATMs relative to population and area, to capture the geographic and demographic penetration of the banking system. Higher branch intensity in demographic and geographic terms would indicate higher possibilities of access and the opportunity for households and enterprises to use financial services. On the other hand, to measure the actual use of bank services, they present indicators on the number of loan and deposit accounts relative to population and average loan and deposit size relative to GDP per capita. Higher ratios of the number of loan and deposit accounts per capita and lower average loan and deposit amounts relative to GDP per capita would indicate use of deposit and credit services by a greater share of the population and “smaller” clients (Beck et al., 2007b).

Figure 3.1. Financial access and use: Voluntary and involuntary exclusion



Source: Beck et al. (2008c)

Access essentially refers to the supply of services, whereas use is determined by demand as well as supply. Figure 3.1 illustrates the difference between these two concepts. Users of financial services can be distinguished from non-users, and in this last group there are different types of non-users. On the one hand are non-users who do not make use of financial services for cultural or religious reasons or simply because they do not see any need to do it. These non-users have access, but they decide not

¹⁶ Ibid.

¹⁷ Ibid.

to use financial services and therefore exclude themselves from the financial system. From a policymaker's viewpoint, this type of non-users is not a problem since their lack of demand is what drives their non-use of financial services. On the other hand are the involuntarily excluded people who have a demand for financial services but do not have access to them. There are several kinds of involuntarily excluded agents. First, there are households and enterprises who are considered unbankable by commercial financial institutions and markets because they do not have sufficient income or present too high a lending risk. Second, there are people who are excluded due to discrimination based on social, religious, or ethnic reasons. Third, the contractual and informational framework could limit financial institutions from reaching out to certain population groups because the outreach is too costly to be commercially viable. Finally, the price of financial services may be too high or the product characteristics might not be appropriate for certain population groups (Beck et al., 2008c).

Limitations of available indicators and cross-country datasets

It is essential to observe that the available indicators of financial access have strong limitations due to the fact that they do not take into account the access to financial services supplied by non-bank deposit institutions (formal and semiformal)¹⁸. In this sense, it is important to take into account that non-bank deposit institutions account for a significant share of the financial system of some developing economies. For example, in the case of Bolivia, around 25% of the loan portfolio and deposits correspond to credit unions, savings and loan mutuals, and private financial funds, which are not bank deposit institutions. The importance of these financial intermediaries is even higher if we consider that around 50% of lenders and savers are served by this type of financial institutions.

The presence of these non-bank institutions in the Bolivian financial system would also be relevant in terms of diversification of financial institutions and its effect on growth. In this respect, recent studies such as the one of Majerbi (2010) suggest that an institutionally well-diversified financial system is more likely to promote economic growth than less diversified and more concentrated systems. In this way, the different constituents of the financial sector specialize in providing services to different segments of the economy, and they are only imperfect substitutes for each other¹⁹.

In 2010, the IMF launched a new dataset relating to access to finance²⁰. This set is built on the basis of research by Beck et al. (2007b) and so far contains annual data from about 189 countries for an 8-year period (2004-2012). This new attempt regarding the measuring of access and use of financial services across countries includes data about the bank and non-bank branch network, availability of automated teller machines, deposits, loans, debt securities issued, and insurance.

The consideration of access to non-bank financial institutions is an important feature and improvement in this new IMF dataset. However, the role played by non-financial institutions (such as NGOs) is still not considered in the measurement of access to finance. This is mainly due to non-availability of data. Another recent attempt to measure access to finance is the "Financial access report" prepared by the Consultative Group to Assist the Poor (CGAP) and the World Bank. This annual report is available for 2009 and 2010 and presents indicators on access to savings, credit, and payment

¹⁸ By formal non-bank deposit institutions, we are referring to open credit unions, saving and loan mutuals, and private financial funds. These institutions are regulated and supervised by authorities, while the semiformal institutions are exempt from this regulation and supervision. In the case of the semiformal institutions we must refer to closed credit unions and NGOs.

¹⁹ Previous to the work of Majerbi (2010), there was a study by Boyreau (2010) about the effect of financial development on economic growth for the case of China that already introduced among its indicators of financial development an indicator of financial institution diversification measured by a bank concentration index.

²⁰ "The Project's data collection effort, with initial financial support from the government of the Netherlands, complements the work done by the United Nations and the World Bank in the context of the UN Advisors Group on Inclusive Financial Sectors in which the IMF is represented. The Project's periodic surveys make use of the IMF's existing broad network of country correspondents for the IMF's flagship statistical publication — the International Financial Statistics (IFS)" (IMF, 2010).

services in banks and regulated non-bank financial institutions. The data reports are based on a survey of financial regulators in 135 and 142 economies for 2009 and 2010, respectively.

Although the work of CGAP and the World Bank (2009 & 2010) can be regarded as a very important step in financial access measurement, we have to recognize that their indicators have significant measurement limitations. Specifically, Mylenko et al., as authors of these financial access reports sponsored by CGAP and the World Bank, point out:

“The survey collects information only on regulated financial institutions, leaving out non-regulated providers of financial services. This practice is likely to significantly understate the scale of credit services. As a result the available data understates the true scale of financial services provided by regulated financial institutions and likely understates the size of the non-bank segment in relation to commercial banks.”

Additionally, we must also mention that in the reports the distinction between access to finance and use of finance is minimized to the point that in terms of measurement, access and use are treated as interchangeable.

More recently, in 2012, the World Bank has introduced the Global Financial Development Database. It is a multidimensional dataset of financial systems for 202 countries, and for most countries it comprises data for the period 2004-2011. It contains indicators of financial depth, access, efficiency, and stability. The access dimension is measured by the number of bank branches per 100,000 adults.

3.2.2 Microfinance and the poor

Poor agents have a significant lack of access to credit. This fact is understandable because of the absence of collateral that the poor can offer, in addition to the various complexities and high costs involved for the institutions in dealing with large numbers of small, often illiterate borrowers. The poor thus have to rely on loans from money-lenders at high interest rates or from friends and family, whose supply of funds is limited. Microfinance institutions attempt to overcome these limitations through measures such as group lending and regular savings schemes, as well as the establishment of close links with their poor clients (Weiss, 2005; Chandra, 2009).

Originally, microfinance was born as a practice of providing loans to poor entrepreneurs. However, after almost three decades, microfinance appears to be providing a variety of financial services (i.e. saving, loan, insurance, fund transfers) to poor, underserved customers. Therefore, microfinance in terms of access to finance will imply increased access to financial services for low-income individuals (Helms, 2006).

Microfinance is not the only way to reduce poverty

It is often thought that promoting microfinance institutions (MFIs) is the best or only way to help the poor. However, it is important to keep in mind that a strong mainstream financial system is also pro-poor. There is general evidence that financial depth is associated with lower poverty, while for microfinance the evidence is not yet clear. Thus, it seems that the effects of microfinance and mainstream finance on poverty alleviation should be regarded as complementary and overlapping rather than as competitive options (Honohan, 2004a). In this way, despite the considerable body of theoretical and empirical literature relating to microfinance, there are still few works that attempt to build evidence of the impact of microfinance on economic activity and poverty (Bruhn & Love, 2009).

“...[F]or the 3 billion people living on less than \$2 per day, access to even basic financial services can be a critical ingredient in alleviating poverty... Financial services for the poor, often referred to as microfinance, cannot solve all the problems caused by poverty. But they can help put resources and power into the hands of poor and low-income people themselves, letting them make those everyday decisions and chart their own paths out of poverty. The potential is enormous, and so is the challenge” (Helms, 2006, p.1).

Trade-offs for commercial MFIs

The institutions that currently work in microfinance vary in the income levels of the customers they serve, their use of subsidies, and the breadth and quality of services offered. This present scenario presents new opportunities for microfinance institutions as well as trade-offs. One main trade-off relates to providing microfinance on a commercial basis, without long-term subsidies. In this last respect, there are some doubts about the compatibility between self-sustainable microfinance institutions and the goal of serving poor households. Cull et al. (2009) show that most MFIs serving the poorest agents earn profits too small to attract investors seeking purely commercial profits. Therefore, this accounts for the continued importance of subsidies and non-commercial funding to NGOs.

Additionally, if we consider that NGOs make the smallest loans, we have to recognize that they face the highest costs per loan, and consequently they charge very high interest. Therefore, contradictorily, the poorest agents end up paying the most expensive loans. Therefore, the question is whether this kind of socially minded institution should move up-market in order to improve financial performance.

Another key trade-off relates to regulation and supervision. Can NGOs and other socially minded institutions survive regulation without redefining their commitment to the poorest? The study of Cull et al. (2009) shows that rigorous and regular supervision is critical for deposit-taking institutions, but it is also costly, since this regulatory supervision pressures institutions to serve better customers (less poor agents) with larger loans in order to maintain profitability. Additionally, supervision appears related to a higher concentration of staff in the head office, reducing staff that used to work in the branches.

“Overall, microfinance promises to correct market failures by expanding the opportunities of the underserved. For some, the microfinance dream is also to reach the world’s poorest and lift them out of poverty. But evidence suggests that it is difficult to realize both goals at the same time. In reality, microfinance often entails distinct trade-offs between meeting social goals and maximizing commercial outcomes. Reaching the very poor with small-scale services remains a tough business and often entails charging high fees or depending on steady subsidies” (Demirgüç-Kunt, 2010).

3.2.3 Country case empirical evidence on the finance-growth and finance-poverty relationships

Finance and growth

At a country level, the empirical evidence on the relationship between finance and growth is not so extensive. We have collected and summarized the available studies in Table 3.1 (A & B). Table 3.1 A refers to financial development studies while Table 3.1 B considers financial access studies. This empirical country case literature covers the reality of developed and developing countries. For Latin America and the Caribbean region, country case studies are present only for Chile, Venezuela, Mexico, and Bolivia.

Considering the issue of the indicators and data, similarly to international and regional empirical literature on the issue of finance and growth, all country case studies except Boyreau (2003), Nasr (2010), and Hussain and Chakraborty (2012) rely on financial development indicators. Indicators such as the ratio of money supply (measured by M2 or M3) to GDP and the ratio of credit to the private sector to GDP are the most common measures in these country case studies. The work of Nasr (2010), a research-action project sponsored and guided by the World Bank for the case of Egypt, incorporates as a novelty some indicators that reflect the access dimension of finance. In the case of Boyreau (2003), despite the fact that the study uses financial depth indicators to evaluate the impact of financial development on economic growth in China, it also uses a bank concentration index as a kind of indicator of financial institution diversification. Specifically, one of the main conclusions of the study by Boyreau (2003) is that Chinese provinces with more diversified banking sectors appear to grow

faster. The study of Hussain and Chakraborty (2012) looking at India does not focus specifically on the access dimension of finance. However, in order to measure financial development Hussain and Chakraborty use a composite indicator of four different financial variables. Among them is one related to financial access (the number of bank branches per thousand people).

Regarding the characteristics of the data, most of the empirical single country studies are based on national yearly or quarterly data. In many of the cases with yearly data, the results are based on very few observations²¹, which is partly due to the lack of finance indicators that go back long enough to provide sufficient data for the purpose of time series analysis. Specifically, in some studies that scarcity of yearly data has been handled by using quarterly information. However, it is important to note that in those cases (i.e. Dritkasis & Adamopoulos, 2004) economic growth would be regarded as a short-term phenomenon instead of a long-term one.

A few studies are based on sub-national data at the level of cities, provinces, districts, or municipalities. This single country strategy has been used by works such as Boyreau (2003), Guiso, Sapienza, and Zingales (2004), Hasan and Zhou (2006), Koetter and Wedow (2006), Valev (2008), Vaona (2008), Zhang, Wang, and Wang (2012), and Hussain and Chakraborty (2012).

With regard to methodological issues, as we can observe in Tables 3.1 A and B, many of the country case studies on the impact of finance on growth rely on time series analysis, with the exception of Aziz and Duenwald (2002), Boyreau (2003), Hasan and Zhou (2006), Hernandez and Parro (2005), Koetter and Wedow (2006), Ljungwall and Li (2007), Nasr (2010), Valev (2008), Vaona (2008), and Zhang et al. (2012). The tri-variate vector autoregressive (VAR) framework²² was applied in a majority of the time series studies²³ mentioned here. Within this framework, the Granger causality test was used, applying co-integration and vector error-correction (VEC) methodology.

Panel data analysis is also used in some studies such as the case of Aziz and Duenwald (2002), Boyreau (2002), Hasan and Zhou (2006), Ljungwall and Li (2007), and Zhang et al. (2012). All of them approach the case of China using data at a sub-national level (provinces and cities). In the same methodological line is the work of Koetter and Wedow (2006) that presents empirical evidence for Germany based on panel data analysis prepared from annual data per district for the period 1994-2003. As in the case of international general or regional evidence, most of these country case studies reveal evidence that is consistent with the view that financial development is engine of economic growth. This evidence pertains to countries such as Indonesia, Egypt, Sierra Leone, Malaysia, Pakistan, United Kingdom, India, Korea, Chile, Greece, Tunisia, Turkey, China, Bolivia, Cameroon, Germany, China, Venezuela, Mexico, Singapore, Macau, Sri Lanka, Bangladesh, Namibia, Australia, Bulgaria, Italy, and Fiji.

Only the studies of Akinboade (2000), Chang (2002), Aziz and Duenwald (2002), Boyreau (2003), and Odhiambo (2007) do not support the supply-leading hypothesis. The work of Akinboade (2000) looks at the case of Tanzania, and it surprisingly found a negative and significant relationship between financial depth and economic growth overall and during the period of financial liberalization in this country. The empirical results of Odhiambo (2007) reveal that in Kenya there is a uni-directional causal flow from economic growth to financial development.

Chang (2002), Aziz and Duenwald (2002), Boyreau (2003), Hasan and Zhou (2006), Ljungwall and Li (2007), and Zhang et al. (2012) built empirical evidence for the Chinese case. The results of Chang (2002) do not support the demand-following nor the supply-leading hypothesis. In fact, independence between financial development and economic growth was found for mainland China in the period 1987-1999. In the case of Aziz and Duenwald, the conclusions are mixed. On the one hand, the study

²¹ Between 20 and 40 observations.

²² Apart from the growth and finance variables, the third variable that is typically included in these studies is investment.

²³ A few studies such as Waquaca (2004) applied bi-variate vector auto-regression.

shows that financial development as proxied by total bank lending has not significantly boosted growth among China's provinces. On the other hand, there is evidence that non-state credit has had a statistically significant though small effect on growth and that non-bank sources of finance have played a significant role in financing China's growth. The empirical results of Boyreau (2003) are also mixed, since they suggest that the credit extended by the banking sector at the state level has a negative impact on provincial economic growth, while they also show that Chinese provinces with more diversified banking sectors appear to grow faster. Regarding more recent evidence for China, the studies of Hasan and Zhou (2006), Ljungwall and Li (2007), and Zhang et al. (2012) conclude that financial development has been robustly associated with economic growth in China.

Table 3.1 A. Single country studies on financial development and growth

Author/ Year	Case	Methodology & Data	Finance Indicators	Main Findings
Abdurohman (2003)	Indonesia	Ordinary Least Squares (OLS) with robust error procedure Quarterly data at national level for the period 1983-1997	Financial development measured by the ratio of the credit to the private sector to GDP	Results are consistent and support the supply-enhancing growth view. Therefore, more finance = more growth.
Abu-Bader & Abu-Qarn (2005)	Egypt	Time series analysis (Granger causality test & vector error correction) National annual data for the period 1960-2001	Four proxies of financial depth: 1)ratio of M2 to GDP, 2)ratio of M2 minus currency to GDP, 3)ratio of bank credit to the private sector to GDP, 4)ratio of credit issued to nonfinancial private firms to total domestic credit	Financial development causes (Granger) growth either through increasing investment efficiency or through increasing resources for investment.
Adamu & Kargbo (2011)	Sierra Leone	Time series analysis (unit root and co-integration tests) National annual data for the period 1970-2008	Financial Sector Development Index comprising three indicators (ratio of bank deposit liabilities to GDP, ratio of domestic private credit to GDP, an important channel through which financial and the share of private credit in total domestic credit)	Financial development exerts a positive and statistically significant effect on economic growth, and investment is of domestic private credit to GDP, an important channel through which financial development feeds economic growth.
Adamopoulos (2009)	Ireland	Time series analysis Annual data for the period 1965-2007	General stock market index Domestic bank credits to private sector to GDP	Granger causality tests indicate that economic growth causes credit market development, while there is a bilateral causal relationship between stock market development and economic growth. Therefore, it can be inferred that economic growth has a positive effect on stock market development and credit market development.
Akinboade (2000)	Tanzania	Static ordinary least squares (SOLS) and dynamic ordinary least squares (DOLS) estimation methods Annual data at national level for the period 1966-1996	Financial deepening measured as M3 to GDP	The relationship between finance and growth appears surprisingly negative and significant overall and during the period of financial liberalization but insignificant during financial repression.
Al-Malkawi, et al. (2012)	United Arab Emirates	Autoregressive distributed lag (ARDL) approach to co-integration Annual data series for the period 1974 to 2008.	Monetization ratio (M2/GDP) Ratio of the credit provided to the private sector by commercial banks as a % of the GDP	Negative and statistically significant relationship between finance and economic growth. Results also suggest a bi-directional causality between the two variables. Overall, the evidence supports neither the demand-following nor the supply-leading hypotheses for UAE.
Ang (2007)	Malaysia	Time series analyses (Unit root tests and the co-integration test draw upon the Autoregressive Distributed Lag (ARDL) bounds approach) National annual data for the period 1960-2003	Financial development defined as the ratio of bank credit to the private sector to GDP	Financial development leads to higher growth via promoting both private saving and investment. The findings also support the hypothesis of endogenous financial development and growth models asserting that finance leads to higher growth through improved efficiency of investment.
Aslam et al. (2011)	Pakistan	Time series analysis (unit root, co-integration and causality tests) National annual data for the period 1973-2009	Financial depth measured as 1) real broad money (M2) and 2) Real domestic credit provided by banks	Supply-leading hypothesis accepted. Therefore, more financial development = more economic growth.
Asteriou & Simon (2000)	United Kingdom	Time series analysis (co-integration and causality tests) UK annual data	Proxies of financial and stock market development	Support for the supply-leading hypothesis, so the causal directions run from finance to the real sector.
Aziz & Duenwald (2002)	China	Panel data analysis (fixed effect panel regressions) Annual data at provincial level for the period 1988-1997	Financial development measured by the non-state sector credit to GDP	The expansion of credit did not exert a significantly effect on economic growth, but non-state bank credit exerted a positive and statistically significant influence on growth.
Bhattacharya & Sivasubramanian (2003)	India	Time series analysis (unit root and co-integration analysis) Annual data for the periods 1970-1971 to 1998-1999	Financial development measured by broad money (M3)	Financial development led GDP growth and not the other way around.
Bida Ndako (2010)	South Africa	Time series analysis Quarterly time series data from Q1 1983-Q4 2007	Bank credit to private sector Turnover ratio Value of shares traded	In the long term, it shows evidence of bidirectional causality between finance and growth using the banking system proxy, while when stock market variables are used, it indicates unidirectional causality from growth to the stock market system. The impulse response functions and variance decompositions indicate that finance has a short-term impact on growth. Meanwhile, SVAR results indicate little evidence that finance promotes growth in the long term.

Chang (2002)	China	Time series analysis (multivariate VAR models, co-integration and Granger causality tests) Mainland China quarterly data over the period 1987 to 1999	Financial development measured by the non-state sector credit to GDP	Independence between financial development and economic growth. This empirical result supports neither the demand-following nor the supply-leading hypothesis.
Chakraborty (2010)	India	Time series analysis (co-integration test and vector error correction method) National quarterly data for the period 1993 to 2005	Proxies of stock market development (market capitalization) and bank development (money market rate of interest)	No support for the hypothesis that stock market development would play an important role in economic growth. On the contrary, reform measures in the banking system appear to have promoted growth significantly.
Choe & Moosa (1999)	Korea	Time series analysis, causality, and non-nested model selection tests National annual data covering 1970-1992	Flows of funds for the household and business sectors Financial assets of the household sector and financial liabilities of the business sector	Financial development in general leads to economic growth, and financial intermediaries are more important than capital markets in this relationship.
Driktasis & Adamopoulos (2004)	Greece	Multivariate autoregressive VAR model Quarterly data period Q1 1960-Q4 2000	The ratio of money supply (M2) to the level of GDP	Bilateral (strong) causal relationship between financial development and economic growth.
Ghali (1999)	Tunisia	Time series analyses (unit roots, co-integration and Granger causality tests) National annual series for the period 1963-1993	The ratio of bank deposit liabilities to nominal GDP The ratio of bank claims on the private sector to nominal GDP	Stable long-term relationship between financial development and output, with causality running from finance to growth. Short-term changes and long-term movements in financial ratios have a significant effect on economic growth.
Gurguk & Lukasz (2011)	Poland	Time series analysis Quarterly data for the period Q1 2000 – Q4 2009	Ratio of bank claims on private sector to nominal GDP Ratio of bank deposit liability to nominal GDP Ratio of Warsaw Stock Exchange turnover to nominal GDP Reserve bank discount rate Interbank offer rate	Causality running from the development of the stock market to economic growth and from economic growth to the development of the banking sector. This implies that the direction of causality strongly depends on which particular area of the financial sector is considered.
Halicioglu (2007)	Turkey	Time series analysis (co-integration and Granger causality tests) National annual data from 1968 to 2005	The ratio of broad money (M2) to nominal GNP The ratio of bank deposit liabilities to nominal GNP	Long-term relationship between the financial development proxies and economic growth. Policies designed for financial deregulation and promotion of the financial sector would improve growth.
Hasan & Zhou (2006)	China	Panel data analysis Annual data covering 31 Chinese provinces for the period 1986-2002	Loans by state banks to GDP Private lending to total loans Corporate bonds issuance to GDP The number of listed firms to total firms	Evidence suggests that the development of financial markets, institutions, and instruments have been robustly associated with economic growth in China.
Hernandez & Parro (2005)	Chile	Contextual analysis, graphical and correlation analyses National yearly data for the period 1961-2001	Financial deepening measured as the ratio of credit to the private sector to GDP	Financial development has contributed significantly to economic growth in Chile for the study period.
Humérez & Yáñez (2010)	Bolivia	Time series analysis (VAR and SVAR models) National quarterly data for the period 2000-2009	Financial deepening measured by the ratio of M3 to GDP and the growth rate of financial sector output	Financial development has a positive effect on economic growth; however, such influence is modest. There is the necessity to promote a more efficient and developed financial system in order to increase the growth effect of the financial sector.
Johannes et al. (2011)	Cameroon	Time series analysis (unit root, co-integration and causality tests) National annual data for the period 1975-2005	One proxy of financial depth (the currency plus demand and interest bearing liabilities of banks and other financial intermediaries divided by GDP) and another proxy of the allocative efficiency of the financial system (Bank credit allocated to private firms)	Financial development has a positive effect on growth in the long run through efficient collection and allocation of financial resources. In order to boost this positive effect of the financial sector, more reforms have to be directed toward the improvement of its deepening and efficiency in resource allocation.
Islam (2012)	Malaysia	Co-integration and error correction mechanism Annual data for the period 1974-2004	Ratio of total financial assets of non-bank financial institutions to GDP	Non-bank financial intermediaries and economic growth are co-integrated. Also, there is evidence of a unique long-term causality running from non-bank financial intermediaries to per capita economic growth, but not vice-versa.
Kenourgios & Samitas (2007)	Poland	Time series analysis (co-integration techniques) Quarterly data for the period 1994-2004	Gross claim on the private sector divided by GDP Deposit money bank credit to the private sector divided by GDP Value of the shares traded on the country's stock exchange as a percentage of GDP	In the long term, credits to the private sector have been one of the main forces in economic growth in Poland.
Koetter & Wedow (2006)	Germany	Panel dynamic data analysis Annual data for the period 1994-2003 per districts	Financial development is measured in terms of quantity and quality. The quantity is measured by the amount of loans and securities over GDP, and the quality is approximated by cost efficiency, measured with stochastic frontier analysis.	Support for the notion that the quality of financial intermediation affects growth, suggesting that economic expansion requires better but not necessarily more banking. The traditional proxy of credit volume to GDP used in most studies receives no statistical support for the sample.
Ljungwall & Li (2007)	China	Panel data analysis (GMM estimations) Annual data covering 28 Chinese provinces for the period 1983-2003	Alternative proxies for: 1) Financial depth, 2) Government intervention in financial resources, and 3) Market-oriented transactions	Financial intermediation toward more market-oriented financing is a factor in the link between FDI and growth. Continued financial reforms would provide an even better environment for domestic and foreign capital.

Lopez (2003)	Venezuela	Time series analyses National quarterly data for the period 1983-2002	Financial deepening measured by the total private credit	The variation of the credit explains variations in the product measured as GDP.
Lopez & Rodriguez (2009)	Mexico	Time series analysis (unit root, co-integration and causality tests) National quarterly data for the period 1990-2004	Financial depth measure as the ratio of M4 to nominal GDP	Financial development exerts a positive effect on economic growth. Additionally, the causality tests show that the relationship between these two variables is bi-directional.
Murinde & Eng (1994)	Singapore	Time series analysis National annual data for the period 1960-1990	Financial deepening measured as: 1)the ratio of M2 to GDP and 2)the ratio of M3 to GDP	Evidence largely supports the supply-leading hypothesis. So financial development explains economic growth.
Morales (2007)	Bolivia	Correlation and regression analyses National annual data for the period 1981-2005	Financial deepening measured as the total bank deposit to GDP	The financial sector in Bolivia seems too small, despite the high deposit to GDP ratio, to really have an impact on economic growth. Other factors that directly augment productivity are probably more important.
Ngai Wa (2002)	Macau	Contextual and trend analyses National annual data (1984-2000)	2 indicators of financial deepening: 1)M2 to GDP and 2)Bank credit to GDP	The correlation between real economic growth and financial development seems to exist.
Odhiambo (2007)	Kenya	Time series analyses (Johansen-Juselius co-integration method and error-correction mechanism) National annual data for the period 1965-2005	Financial depth measured as M2 to GDP	Uni-directional causality from economic growth to financial depth. Evidence that growth Granger causes savings while savings Granger cause financial depth.
Paudel & Perera (2009)	Sri Lanka	Time series analysis (Johansen co-integration test and the Error Correction Model) National annual data for the period 1955 to 2005	6 alternative measures of financial development such as M2 to GDP and M3 to GDP	Financial development causes economic growth with two-way causality.
Prakash (2009)	India	Monthly dataset of India from 1993-2008 Granger-causality test in a Vector Auto Regression (VAR) framework	4 proxies of financial development: market capitalization, broad money supply (M3), foreign trade, and bank credit (Y5)	Co-integration test finds long-term equilibrium relationship between finance and growth. The Granger causality test finds the existence of bidirectional causality between money supply and economic growth, bank credit and economic growth, money supply and foreign trade, and market capitalization and foreign trade. It also confirms the unidirectional causality from market capitalization to economic growth.
Rahman (2004)	Bangladesh	Trends, scatter plots and time series analysis (Vector Auto Regressions (VARs), unit root and co-integration tests) National annual data for the period 1976-2002	3 alternative proxies of financial development: 1) Bank credit to the private sector to GDP ratio, 2) Total deposits to GDP ratio, 3) Broad money (M2) to GDP ratio	Long-term impact of financial development on investment and per capita income. Thus financial development has a direct and indirect effect (via means of investment) on income per capita.
Sunde (2011)	Namibia	Time series analysis (causality tests) Quarterly data for the period 1990-2008	Financial depth measured by 1)The ratio of private sector credit to GDP, 2)the lending rates, 3)ratio of liquid assets to GDP	Bidirectional relationship between financial sector development and economic growth.
Thangavelu & Beng (2004)	Australia	Time series analysis, VAR Model Quarterly data at national level for the period 1960-1999	Financial development measured as: 1) the ratio of domestic bank liabilities to GDP and 2)the equities turnover to GDP	Evidence of causality from financial intermediation and financial markets to economic growth.
Valev (2008)	Bulgaria	Pane data analysis (GMM procedure) Semi-annual data for 14 economic sectors for the period 1999-2005	Alternative measures of bank credit as bank credit to private non-financial enterprises, maturity of credit, average size, and the number of loans and currency composition of bank loans	For every 10% points increase in the ratio of credit to GDP, annual economic growth increases by about 0.3% points. The effect of credit on investment is particularly strong in the manufacturing and transportation sectors.
Vaona (2008)	Italy	Cross-sectional and panel regression analysis Annual data at municipality level	Financial development measured as the ratio of private credit to GDP	Both cross-sectional and panel data estimates show that more finance generates more growth.
Waqabaca (2004)	Fiji	Time series analyses (unit root, co-integration, and bi-variate vector auto-regressive) National annual data for the period 1970-2000	Three proxies of financial development: 1) Ratio of financial assets to GDP, 2)Liquid liabilities to GDP, 3)Private credit to GDP	Positive relationship between financial development and economic growth. The direction of the causation seems to run from growth to financial development.
Yang & Hoon (2008)	Korea	Tests for super-exogeneity to examine whether or not the financial development control causes economic growth or vice versa National annual data for the period 1971-2002	Financial development is measured by the ratio of the sum of loans and discounts of all financial institutions and trading value of securities (stocks and bonds) to nominal GDP	Evidence in favor of the "finance causes growth" view for the case of Korea while rejecting the "growth causes finance" view. Therefore, Korea should give policy priority to financial reform rather than economic growth.
Zhang et al. (2012)	China	Cross-sectional regressions and first-differenced and system GMM estimators for dynamic panel data Data from 286 Chinese cities over the period 2001-2006	Ratio of total loans in the financial system (banking institutions and non-banking financial institutions) to GDP Ratio of total deposits in the financial system to GDP Ratio of total household savings deposited in the financial system to GDP Share of fixed asset investment financed by domestic loans relative to that financed by state budgetary appropriation Ratio of corporate deposits to total deposits in the financial system	Traditionally used indicators of financial development are generally positively associated with economic growth after controlling for many factors associated with growth. The size and depth of the financial sector spur economic growth. With more use of markets and profit-oriented financial transactions and mobilization of corporate deposits, the development of financial intermediation in China after WTO entry positively influences economic growth in China.

Source: Author's own preparation

Table 3.1 B. Single country studies on access to finance and growth

Author/ Year	Case	Methodology & Data	Finance Indicators	Main Findings
Boyreau (2003)	China	Regression framework using the GMM system estimator Annual data of 26 provinces between 1990-1999	Four indicators of financial intermediation: 1) ratio of total bank deposits to GDP, 2) ratio of loans to deposits of the state owned banks, 3) ratio of state owned banks credit to GDP, 4) bank concentration index	Financial depth does not contribute to local economic performance. The credit extended by the state banking sector has a negative impact on economic growth. Provinces with more diversified banking sectors appear to grow faster.
Nasr (2010)	Egypt	Contextual analysis, trends, scatters plot, and correlation analyses Data of five surveys carried out in the period 2004-2006 by the World Bank, the Social Research Center of the American University in Cairo, and Egyptian government ministries	Diverse indicators of financial deepening, access to finance, institutional and regulatory framework	The potential for financial development in Egypt is large, as macroeconomic policies and overall business environment fundamentals are increasingly supportive. Public ownership of real and financial assets has discouraged competition and the development of deep and well-regulated financial systems, including non-bank institutions. Smaller private and foreign banks are more active in expanding financial access for households and small and medium enterprises.
Hussain & Chakraborty (2012)	India	Time series techniques Annual data for the period 1985-2009 in Assam, an Indian state	A composite indicator of 4 different financial variables (1) The number of bank branches per thousand people, (2) The ratio of outstanding credit of all the scheduled commercial banks of the state to the different sectors to the State GDP, (3) The share of the financial system in GDP, and (4) credit-deposit ratio of all scheduled commercial banks of Assam	Co-integrating relationship between finance and growth. Further, Granger causality tests suggest that financial development causes economic growth in the case of Assam. The impulse response function has been traced out for both the variables. It can be inferred from the study that financial development in Assam needs to be explored, as it is an important channel through which economic growth is nourished.

Source: Author's own preparation

As we already mentioned, there is country case evidence about the relationship between finance and growth for the case of Bolivia. Part of this evidence includes the studies of Morales (2007) and Humerez and Yañez (2010) that evaluate the effect of financial development on economic growth. The main findings suggest that finance has a positive effect on economic growth in Bolivia, despite this effect being considered modest in both studies. The empirical evidence was built only on financial developing indicators focusing on aspects such as size or efficiency of the financial system and not considering its access dimension (See Table 3.1 A).

Finance and social fairness

With respect to the relationship between finance and social fairness, country case literature is scarce. Among those few country case studies that are somewhat related to the influence of finance on poverty (or inequality) are the ones of Ang (2008), Bittencourt (2006), Geda et al. (2006), Kibua (2007), Hamori and Inoue (2010), Ho and Odhiambo (2011), Law and Tan (2009), Liang (2006), Manh Hao (2005), Motonishi (2004), Odhiambo (2010), Quartey (2005), Shahbaz and Islam (2011), Shahbaz et al. (2012), Aliero and Ibrahim (2012), and Umesh (2012) that present evidence for India, Brazil, Ethiopia, Botswana, Kenya, Namibia, China, Malaysia, China, Vietnam, Thailand, Kenya, Ghana, Pakistan, Nigeria, and Iran. The works of Manh Hao (2005), Quartey (2005), Geda et al. (2006), Kibua (2007), Hamori and Inoue (2010), Ho and Odhiambo (2011), and Aliero and Ibrahim (2012) examine the relationship between finance and poverty, while the rest consider the effect of finance on inequality (see Table 3.2 A and B).

As we can see in Table 3.2 B, the access dimension of finance is considered only in the studies of Manh Hao (2005), Geda, Shimeles and Zerfu (2006), Kibua (2007), and Aliero and Ibrahim (2012) for the cases of rural Vietnam, Ethiopia, Botswana, Kenya, Namibia, and Nigeria. Some proxies of access to credit are used in these studies in order to measure financial access.²⁴ Bittencourt (2006) in his work on the case of Brazil also mentions the issue of financial access as part of its theoretical framework and conclusions, although in the empirical analysis pure financial development proxies are used.²⁵

²⁴ These proxies of financial access are more measures of use of finance than access to finance.

²⁵ The study of Bittencourt (2006) suggests that this is not only because the poor can invest the acquired credit in all sorts of productive activities, but also because those with access to financial markets can insulate themselves against recurrent poor macroeconomic performance, which is exemplified by high inflation rates.

In terms of methodology and data, most of the studies applied time series and panel data analyses. Except for the study of Law and Tan (2009) about the relationship between finance and inequality in the case of Malaysia, all the studies rely on annual data analysis, covering periods of financial repression and financial liberalization. This last consideration is important if we consider that financial repression is usually associated with low levels of financial development.

With respect to the results, all the studies except the one of Law and Tan (2009) and Ho and Odhiambo (2011) found that financial development has a positive effect in terms of social fairness. In fact, the main findings suggest that financial development helps in reducing income inequality and alleviating poverty. In the work of Ho and Odhiambo (2011), for the case of China, the evidence is mixed since the causal relationship between financial development and poverty appears to be sensitive to the finance indicator used. When domestic credit to the private sector is used, both financial development and poverty reduction are found to cause each other in the short term. But when money supply to GDP is used, poverty reduction causes financial development, both in the short and in the long term, while financial development only causes poverty reduction in the short term.

Table 3.2 A. Single country studies on finance-social fairness (Poverty or inequality)

Author & Year	Case	Methodology and Data	Finance Indicator	Main Findings
Ang (2008)	India	Time series analysis (co-integration tests and ARDL estimations) Annual data for India over the period 1951-2004	Proxies of financial development and liberalization (private credit/GDP (M3-M1/GDP), share of commercial bank assets in the sum of commercial plus central bank assets, financial liberalization indexes, directed credit, interest rate restraint)	Financial development helps reduce income inequality, while financial liberalization seems to have exacerbated income inequality in India. The results are robust for the use of different measures for financial development and financial liberalization.
Bittencourt (2006)	Brazil	Panel time series and time series data analyses National data for the period 1980-1990	Four proxies of financial depth: M2/GDP, M3/GDP, credit to the private sector/GDP, and personal credit/GDP	Broader access to financial and credit markets had a significant and robust effect on reducing income inequality.
Hamori & Inoue (2010)	India	Dynamic panel data analysis (Generalized Method of Moments) Data of 28 states and union territories for the period 1973-2004	Financial deepening measured as a) Logarithm of credit amount as share of the output b) Logarithm of saving amount as share of output.	Financial depth and economic growth alleviate poverty. The results are robust for changes in poverty ratios in rural areas, urban areas, and the whole economy.
Ho & Odhiambo (2011)	China	Time series analysis (ARDL-Bounds testing procedure) Annual time series data for the period 1978-2008	Two proxies of financial development: (1) domestic credit to the private sector to GDP and (2) broad money (M2) supply to GDP	Causal relationship between financial development and poverty seems sensitive to the finance proxy used. When domestic credit to the private sector is used, both financial development and poverty reduction are found to cause each other in the short term. But when (M2/GDP) is used, poverty reduction causes financial development, both in the short and in the long term, while financial development only causes poverty reduction in the short term.
Law & Tan (2009)	Malaysia	Time series analysis (ARDL-Bounds testing procedure) National quarterly data for the period 1980-2000	Alternative proxies of financial depth such as private sector credit (as % of GDP) and stock market capitalization (as % of GDP)	Financial development appears as a very weak and statistically insignificant determinant of income inequality. The evidence remains valid for a variety of finance proxies.
Liang (2006)	(rural) China	Generalized Method of Moments (GMM) techniques Chinese provincial annual data over the period of 1991-2000	Rural financial development level (ratio of total rural loans to rural GDP)	Financial development significantly contributes to the reduction of rural income inequality. Strong support for the linear hypothesis, but not for the inverted U-shaped relationship between finance and inequality.
Motonishi (2004)	Thailand	Panel data analysis Annual data (24 years, 9 national surveys) for 13 regions	Financial development measured by the ratio of insurance and interest expenditures to income	Limited evidence that financial development alleviates the inequality increase. The effect of financial development is not large and is dominated by agricultural factors.
Odhiambo (2010)	Kenya	Time series analysis National annual data for the period 1968-2006	Financial depth measured as M2 to GDP	Distinct causal flow from financial development to poverty reduction.
Quartey (2005)	Ghana	Time series analysis Annual data from 1970 to 2002	Two proxies of financial depth: (1) Ratio of domestic credit to the private sector to GDP and (2) Ratio of M2 to GDP	Even though financial sector development does not cause savings mobilization, it induces poverty reduction.

Shahbaz (2011)	Pakistan	Auto Regressive Distributed Lag (ARDL) bounds testing approach to co-integration to examine the existence of long-term and the error correction model (ECM) for short-term relationships	Financial development computed by the ratio of domestic credit to the private sector to GDP	Financial development reduces income inequality while financial instability aggravates it. No support for the inverted U hypothesis. Appropriate reforms aimed at developing a well-organized financial sector can help reduce income inequality.
Shahbaz, Muhammad (2012)	Iran	Annual data for period 1973-2003 Time series techniques Annual data for the period 1965-2011	Real domestic credit to private sector per capita	Confirmation about the long-term relationship between the variables. Furthermore, financial development reduces income inequality.
Umesh Arora, Rashmi (2012)	India	Nonlinear Least Squares (NLS) National household sample survey data on monthly household consumption expenditure at the sub-national level for the years 1999–2000 to 2006–2007 at state level	Credit as proportion of State Domestic Product	Financial development is associated with a reduction in inequality, but only in the urban areas. Further, inequality is found to be higher in the richer states compared to less developed and low-income states, and as state income increases, inequality also increases both in the rural and urban areas.

Source: Author's own preparation

Table 3.2 B. Single country studies on access to finance-social fairness (Poverty or inequality)

Author & Year	Case	Methodology and Data	Financial Access Indicator	Main Findings
Aliero, Haruna & Ibrahim, Saifullahi (2012)	Nigeria	Multinomial logit model. Cross-sectional primary data was collected from 384 respondents dwelling in rural areas of Katsina Nigeria state through an administered questionnaire	The level of financial exposure of the respondents for Saving Account, Current Account, Fixed Deposit, Loans, ATM/Credit/Debit Card, Loan, Insurance, Mobile Banking, Internet Banking, Shares and Pension	Negative relationship between poverty level and access to financial services. Promoting access to formal financial services increases the level of income of the rural dwellers and thus a retarding effect on the level of poverty in the rural areas.
Geda et al. (2006)	Ethiopia	Panel data analysis Household data of urban and rural Ethiopia for the period 1994-2000	Financial development measured in terms of access to credit	Access to credit significantly reduces absolute poverty through (i) consumption smoothing and (ii) helping the possibility of escaping poverty trap.
Kibua, Thomas (2007)	Botswana, Kenya and Namibia	Statistical analysis (Kenya) Probit regression model (Botswana) Censored regression model (Namibia) Finmark Trust data of 2003 (with information on 810 households in Namibia and 550 households in Botswana) and secondary data from various government and financial institutions, documents to analyze access to financial services and outreach levels and sustainability in the case of Kenya	Outreach levels and financial sustainability indicators. (Kenya), and the level of exposure of financial products as ATM cards, post office saving accounts, bank saving accounts, mortgage bond or a house loans, current accounts, debit cards, credit cards, petrol cards, transaction or transmission accounts, fixed deposit account, vehicle finance from a bank, loans from a bank, loans from a registered money lender, loans from a unregistered money lender, membership of a saving club, loans and savings from an NGO, accounts with a store, loans or savings and credit cooperative (Botswana and Namibia)	The three separate studies arrived at similar conclusions. In Kenya, because formal financial institutions are concentrated in urban, peri-urban, and cash-crop growing areas, most of the rural poor do not have access to their services. Experience and performance of institutions that offer rural financing in Kenya shows that the poor can also save, borrow, and repay their loans at market rates. Survey data in Botswana showed that the rural poor have different levels of access to the financial sector. Similar results of Namibian survey data lead to the conclusion that improved access to financial services can contribute to poverty reduction among the poor.
Manh Hao (2005)	(rural) Vietnam	Case studies and econometric analyses: Case studies use primary data obtained through interviews and field trips, and the econometric analyses use secondary data drawn from two surveys on living standards in Vietnam (1992 and 1997)	Indicators of access to credit as total formal/informal credit at the province, commune, and village (more use of credit than access) levels	Having access to finance has a positive impact on poverty reduction, but this impact is very small, suggesting that it may not be cost-effective.

Source: Author's own preparation

Microfinance, growth, and poverty: The limitations in the empirical literature

In completing this review of country cases studies regarding the relationships between finance and economic growth and finance and social fairness, it is also important to mention the empirical attempts to evaluate the effect of microfinance on economic growth and poverty. Among some of these studies we can mention the ones by Hulme and Mosley (1996), Mosley (2001), Banegas et al. (2002), Dunn and Arbuckle (2001), McNelly et al. (1996), Khandker (1998 & 2003), Pitt and Khandker (1998), Coleman (1999 & 2004), Chen and Snodgrass (2001), Park and Ren (2001), Duong and Izumida (2002), Kaboski and Townsend (2002), Amin et al. (2003), and Pitt et al. (2003) (as cited in Weiss, 2005 and Morduch, 2011) regarding the cases of Bolivia, Ecuador, Peru, Indonesia, India, Thailand, Bangladesh, Vietnam, and China (Weiss, 2005).

The findings of these microfinance studies are mixed, and they have been highly debatable since there are significant methodology observations to be made about the empirical work. Most of the early microfinance impact studies focused on particular microfinance programs and were based very often on anecdotes from successful MFI clients, while less successful clients were ignored. These studies²⁶ that hoped to measure the impact of microfinance on consumption or income made observations in a variety of ways, but they often failed to make comparisons to credible control groups. In response to this, a growing number of impact evaluations were carried out by independent researchers that introduced more rigorous forms of impact evaluation, such as the randomized control trial (RCT) methodology²⁷. Randomized control trials do far better in terms of credibility, but researchers often tend to investigate narrow populations and short-term outcomes. (Bateman, 2011; Morduch, 2011).

Additionally, most of the studies of the impact of microfinance on growth or poverty have been supported by micro-level evidence based on household data or entrepreneurial data. Macro-level studies are very limited, mainly given the scarcity of reliable macro data on microfinance (Imai, Gaiha, Thapa, & Kobina, 2012). In this sense, it is evident that there is still much research to be done to evaluate the effects of microfinance on economic growth and social fairness.

To conclude this empirical literature review, we have to stress again the scarcity of empirical literature on the access dimension of finance and its effect on growth and social fairness (poverty and inequality). As shown before, the relevance of access to financial services is ample. Therefore, there is a necessity for empirical studies in this field at the international and country case level.

3.3 Some Considerations about the Bolivian Financial System

3.3.1 The structure of the financial system

The financial system of Bolivia, as any other in the world, is the medium where transactions take place between those economic agents who have a shortage of savings and those who have a surplus of savings. These resource movements are made possible by means of institutions that generate, manage, and channel savings resources to investments. This channeling of resources is made possible by means of financial intermediation and the securities market.

The share of bank and non-bank deposit institutions

In financial intermediation, the financial resources are channeled by means of financial intermediaries. This group of intermediaries includes deposit institutions, insurance companies, investment companies, and pension funds. The highest share of financial intermediation (around 88%)²⁸ is provided by deposit institutions. This top share of the financial system is the reason why many authors refer to the deposit institutions as the whole financial system.

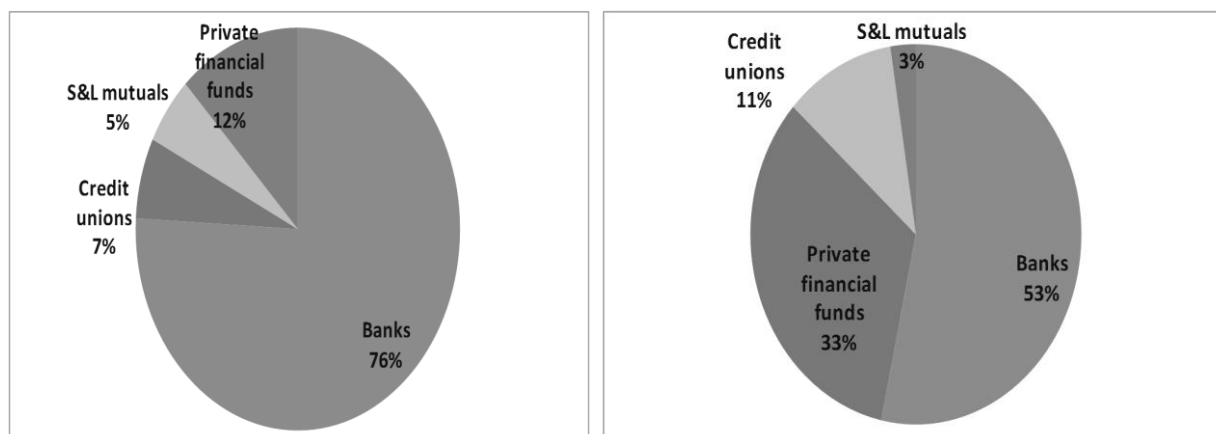
Deposit institutions include functioning bank and non-bank institutions. In this second group, there are a variety of intermediaries: credit unions, savings and loan associations, and private financial funds. Despite the fact that the share of bank institutions in terms of the total loan portfolio is around 75%, it is important to highlight that non-bank institutions serve a very significant number of customers. In 2008, the non-bank institutions were near to representing 50% of the total customers in the system (See Figure 3.2).

²⁶ Overviews of these studies are presented by Weiss (2005) and Armendáriz & Morduch (2010).

²⁷ "This aims to avoid the selection bias in the choice of treatment and control groups that might occur if, for example, those receiving a microloan were already more entrepreneurial than those in the control group. Any impact here would have to be attributed to this characteristic, rather than to a microloan. RCT methodology ensures that both groups studied are as identical as possible, aside from the receipt of microcredit" (Bateman, 2011 p. 2).

²⁸ Based on Banco Central de Bolivia's data (2008), Memoria Annual.

Figure 3.2. Bolivia: Deposit institutions' share of loan portfolio and customers among regulated institutions (2008)



Source: Author's own preparation on basis of PROFIN data

Regulated and non-regulated institutions

Another important characteristic of the financial system in Bolivia is the existence of regulated and non-regulated institutions. The regulated institutions are under the regulatory supervision of the national supervisory authority (Autoridad de Supervisión del Sistema Financiero, ASFI)²⁹. Also known as formal financial institutions, they consist of banks, savings and loan mutuals, open credit unions, and financial private funds.

The non-regulated sector consists of semiformal and informal institutions. In the case of the semiformal ones, they are legal but they are out of the national regulatory supervision exerted by the authorities (Villafani and Ibarregaray, 2002). However, this does not mean that they do not follow any rules or norms. They usually follow some normative framework and internal rules related to their functioning and their legal status. As semiformal institutions are mainly closed credit unions and non-governmental organizations (also known as development financial institutions, or IFDs), it is possible that their non-regulated status will no longer be maintained, since in 2009 the financial supervisory authority called on them to function as regulated deposit institutions. Closed credit unions and NGOs are in the process of being incorporated into the regulatory and supervisory framework of ASFI. In order to have the complete picture, we must also refer to a group of agents or institutions that could be regarded as purely informal and illegal, such as usurers, lenders, pawn agencies, and other agents³⁰.

Regarding the regulated and non-regulated sector (except informal institutions), around 69% of the total loan portfolio is represented by banks. However, this substantial share of the total loan portfolio corresponds to around 36% of the total customers of regulated and non-regulated institutions. On the contrary, non-regulated institutions such as NGOs, whose share of the total loan portfolio is about 5%, are serving around 27% of the total customers. This shows that these non-regulated institutions are reaching a group of customers different than banks³¹ and even different than those served by private financial funds, which manage 11% of the loans with 22% of the customers. As we will see later, both NGOs and private financial funds are microfinance institutions (MFIs).

²⁹ In the framework of the new Political State Constitution (February, 2009) and Supreme Decree 29894 (May, 2009), the superintendent of banks and financial entities came to be called the Supervisory Authority of the Financial System (Autoridad de Supervisión del Sistema Financiero, ASFI). This governmental institution regulates and supervises the deposit institutions. Additionally, since May 2009 it is in charge of the regulation and supervision of the securities and insurance market.

³⁰ Given the restrictions of micro and small-sized enterprises, it is probable that they invoke friends, family, and relatives as lenders.

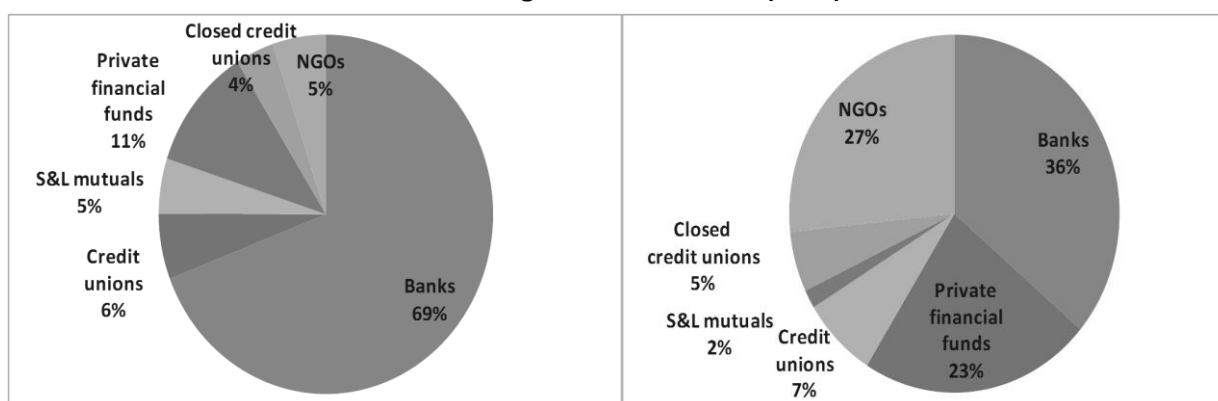
³¹ Except for Banco Sol, Banco Los Andes, and Banco FIE, which are immersed in the microfinance industry.

The importance of non-bank deposit institutions

Figure 3.3 again highlights the importance of non-bank deposit institutions, in this case adding to the picture the non-regulated institutions. In fact, despite the fact that all non-bank institutions (regulated and non-regulated) represent as a maximum 30% of the total portfolio, their significance is great in terms of the number of customers that they serve. As Figure 3.3 shows, non-bank institutions represent around 64% of the customers. Therefore, it is evident that non-bank institutions are serving lower-income households and entrepreneurs, who in terms of credit demand imply loans of smaller amounts. As we will see later, this feature is very important in terms of access to finance by “poor” agents.

The importance of non-bank institutions is also reflected in the number of institutions. Indeed, in June 2010, Bolivia had in operation 13 banks, 8 savings and loan mutuals, 5 private financial funds, 23 open credit unions, 64 closed credit unions, and 15 NGOs (ASFI, 2010a and 2010b).

Figure 3.3. Bolivia: Deposit institutions’ loan portfolio and share of customers among all regulated and non-regulated institutions (2008)



Source: Author’s own preparation on basis of PROFIN data

The second floor bank

With respect to the deposit financial institutions, it is also important to mention the existence of a “second floor bank” under the figure of the Banco de Desarrollo Productivo, Sociedad Anonima Mixta (BDP SAM)³². Like other financial intermediary entities, this is regulated by the national financial authority (ASFI). Its main goal is to channel funds to private financial entities that are functioning under the permission of the ASFI. These funds come from the Central Bank and other external sources and are geared toward financing, production, commerce, and service activities. In addition, the ASFI works as a fiduciary bank, managing autonomous worth, assets, and other financial components.³³

The securities market

The direct financial system in the case of Bolivia has its origins in 1989. The beginning of the operations of the Bolivian stock exchange opened a new scheme of finance where savers and investors, on their own account and risk, can invest in securities, or the securities market provides financing through the issuing of securities. The main transactions executed in the Bolivian stock exchange involve debt instruments issued by private and public entities (around 98% of the total

³² Bank of Productive Development, *Sociedad Anónima Mixta* (essentially a public-private partnership).

³³ Supreme Decree 28999 (January 2007) established the institutional adaptation of NAFIBO SAM to BDP SAM. In this way, BDP SAM became the financial arm of the central government in the framework of the “Development National Plan.” In this plan, one priority of the national productive development is financing with solidarity and promotion characteristics. The goal is to establish convenient financing conditions that take into account the different productive cycles and regions, particularly those excluded from traditional financing.

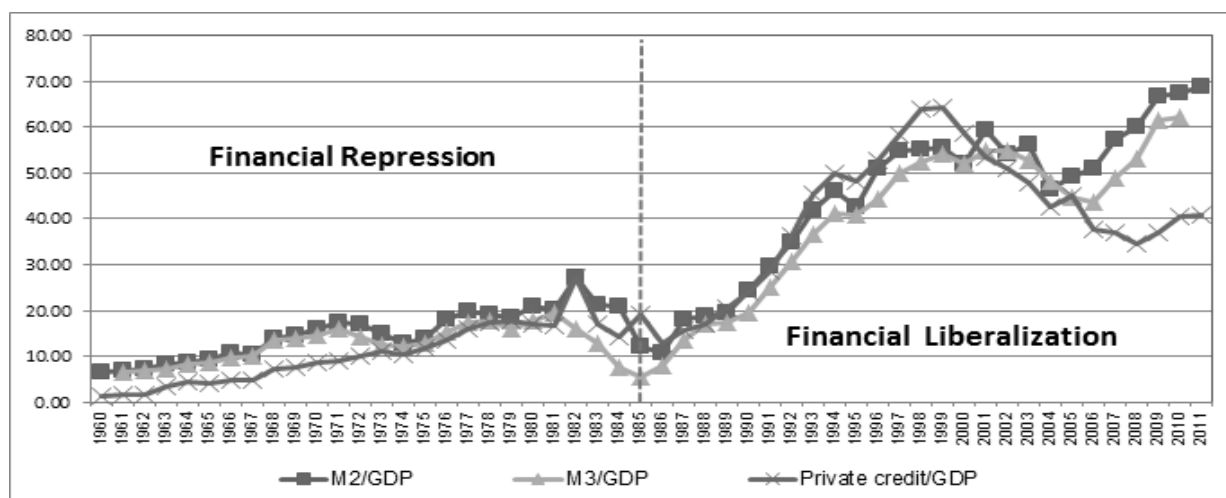
transactions in 2009)³⁴. Its participation in the financial system is very small and its role as an alternative to financing is still very restricted.

3.3.2 From financial repression to financial liberalization

A key characteristic of the financial system in Bolivia is related to the transition from a financial repression to a financial liberalization scenario³⁵. This transition that took place in August 1985 involved the change of a regulated economy to a market economy. The critical point that led to the fragmentation of the regulated economy was the hyperinflation experienced during 1984 and 1985.

In terms of the financial system, the economic model that was based on strong participation and intervention by the state until August 1985 meant a scenario of financial repression. This stage was mainly characterized by controls on the interest rates and the direct participation of the state in financial intermediation by means of the state or development banks. The beginning of a new stage for the financial system in Bolivia involved mainly the liberalization of interest rates in August 1985. However, as we will see later, other important reforms related to the regulatory normative framework came later (since 1987). These regulatory normative reforms led to the consolidation and development of the Bolivian financial system. In fact, as we can observe in Figure 3.4, the Bolivian financial system had a positive evolution from 1987 until 1999, when the Bolivian economy suffered a crisis that lasted until 2004³⁶. Nevertheless, the levels of financial intermediation and depth, measured by M2/GDP and M3/GDP respectively, and the proportion of private credit in relation to the GDP remained higher than in the period of financial repression.

Figure 3.4. Bolivia: Indicators of financial development (1960-2011)



Source: Author's own preparation on basis of WDI (2012) and Beck and Mohseni-Cheraghloou (2012)

Following the argument of McKinnon and Shaw against financial repression, repressive policies are seen to be hostile for financial deepening and consequently for growth. Financial repression has a depressive effect on saving rates, giving rise to capital shortages. McKinnon and Shaw also argued that financial repression tends to selectively ration out riskier projects, irrespective of their social relevance, because interest rate ceilings prevent the charging of adequate risk premiums (Ghost, 2005).

³⁴ For more details, see Informe de Estabilidad Financiera (2010), Banco Central de Bolivia, p. 35.

³⁵ In general, financial liberalization in developing countries has been considered as a necessary and significant part of the economic policy package promoted by what used to be called the "Washington Consensus" (Ghost, 2005).

³⁶ This slowdown in the Bolivian economy meant for the financial system an increase of the non-performing loan portfolio and difficulties in getting savings and allocating credit (given the increase of adverse selection). In this period the liquidation of some commercial banks also took place due to some cases of mismanagement in loan allocation (linked credit).

3.3.2.1 The stage of financial repression before the application of the New Economic Policy

Low financial institutional diversification and financial development

One main characteristic of this phase is the existence of banks as the only financial intermediaries in the credit market. This bank system had grown, supported by the trust of substantial foreign capital inflows and the strong intervention of the state. Government intervention was reflected not only in the control of interest rates and the manipulation of reserve ratios, but also by means of the property of banks (state or development banks).

With respect to this last point, empirical studies such as La Porta et al. (2002), Brath et al. (2001), and Caprio and Martinez (2000) (all cited in Mishkin, 2005) show that greater state ownership of banks is associated with less financial development and lower growth, and this effect is found to be larger for poorer countries. Additionally, these authors conclude that greater state ownership tends to be anti-competitive, resulting in a larger share of credit going to the largest firms, and it is also associated with a higher likelihood of financial instability and banking crises (Mishkin, 2005).

As we can see in Figure 3.4, under this scenario of financial repression the financial system (reduced to the bank system) reflected low levels of financial development in comparison with the ones registered under the financial liberalization period that began in August 1985. Nevertheless, the tendency in terms of depth, financial intermediation, and the private credit share of GDP was positive until 1982. This process was interrupted by various economic and social events such as: a) a drastic reduction in net capital flows, b) a slowdown in economic activity, c) deep changes in the political system of the government, d) the de-dollarization in 1982, and e) the hyperinflation of 1984-85. All these factors together gave rise to financial disintermediation, and thus the main role of the financial intermediation in terms of the channeling of savings resources to investment was reduced drastically (Afcha, Larrazabal, & Cuevas, 1992).

Deficiencies in the regulatory and normative framework

In terms of the regulatory and normative framework at the end of the 1970s there were some modifications related to the Law of Banks, particularly involving the capital requirement norms. However, in addition to being very continuous and sometimes even contradictory, these modifications were not clear since they were characterized by conceptual confusion³⁷. Therefore, under a law that was not even well established in conceptual terms, the supervision was very limited in its role. This limitation was exacerbated during the economic crisis; if the regulation was inefficient in stable periods, it was even more inefficient and useless during the hyperinflation of 1984-1985. In this respect, this experience is a reflection of what economic literature (i.e. Demirgüç-Kunt, 2009; Mishkin, 2005) established regarding the important role of a well-established, effective, and efficient regulatory normative supervisory framework in terms of financial development³⁸.

The crisis of the mid 1980s

The necessity of a new economic model in Bolivia arose from the economic, political, and social crisis experienced in Bolivia during the first half of the 1980s. Until then, the economic model was based on the state's capitalism, with the state participating in productive activities. This model, despite leading

³⁷ There was deep confusion about the use of terms such as capital, reserves, liquid capital, non-liquid capital, concentration of portfolio, non-performing portfolio, and irrecoverable portfolio.

³⁸ "Government regulation can promote transparency by increasing the amount of information available in financial markets. Many developing and transition countries, unfortunately, have an underdeveloped regulatory apparatus that retards the provision of adequate information to the marketplace. For example, these countries often have weak accounting standards and disclosure requirements, making it hard to ascertain the quality of a borrower's balance sheet. As a result, asymmetric information problems are more severe, and the financial system is severely hampered in channeling funds to the most productive uses. The institutional environment of weak property rights, a lack of collateral, government intervention through directed credit programs and state ownership of banks, an inefficient legal system, and weak government regulation to promote transparency all help explain why many countries stay poor while others grow richer" (Mishkin, 2005, p. 8).

to positive results in terms of economic growth, especially during the 1970s, could only be sustained while the government had the financing of external resources. Additionally, the actions of the government were not based on efficiency and effectiveness. The capacity of the state to design and carry out its expenditures and its investment policies and programs was continually deteriorating. Therefore, starting already in the 1980s, the figure of an inefficient state, functioning with high and increasing fiscal deficits, was evident (Antelo, 2000).

To make the situation worse, with the reduction of external financing, these fiscal deficits being financed by the Central Bank gave rise to increasing money issuance and consequently inflation. Additionally, the act of establishing price controls had an immediate effect on public enterprise revenues, leading to negative interest rates. In the case of the exchange rate, the control price triggered an overvaluation of the real exchange rate. The commercial policies that had until then aimed to protect the national industry³⁹ generated inefficiency in resource allocation and gave rise to low internal savings that were insufficient to promote investment.

Table 3.3. Bolivia: Selected macroeconomic indicators (1981-1985)

Indicators	1981	1982	1983	1984	1985
Inflation rate (%)	25.1	296.6	328.5	2177.2	8170.5
GDP growth rate	0.3	-3.9	-4.0	-0.2	-1.7
Public deficit (% GDP)	-8.9	-15.9	-19.8	-25.4	-9.8
M1 growth rate	20	230	210	1782	5929
Degree of financial intermediation (M2/GDP)	20.36	27.12	21.11	20.95	12.14
Net capital flows (Millions of USD)	28	-74	-232	-183	-139
Net international reserves (Millions of USD)	-172.3	-102.1	298.7	134.8	32.2
Exchange rate gap official/black market (%)	27	112	176	188	55
Real interest rate for fixed term deposits (%)	2.6	-4.7	-17.6	-30.6	-6.6
Debt service (% exports)	32.3	34.3	43.7	47.7	39.5

Source: Author's own preparation based on Antelo (2000) and WDI (2012)

In terms of the external context, until the end of the 1970s the increase in commodity prices⁴⁰ and the excess of international capital flows meant a favorable situation for the Bolivian economy. But starting in the 1980s, the economic deceleration in Western countries gave rise to a different international context characterized by increasing international interest rates, reversion of capital flows (see Table 2.3), and decreasing commodity prices. So not only did the capital flows that were financing the fiscal deficit decrease, but so did the government revenues earned from commodity exports (which mostly benefited public enterprises). Additionally, the increasing international interest rates meant a higher debt service. This situation increased the pressure even more on the public accounts.

Given this situation and the loss of net international reserves⁴¹, the Central Bank recommended that the government “de-dollarize” the economy in 1982. This measure had among its goals to reduce the demand for dollars, to restore the exchange rate as an economic policy instrument, and to relieve the obligations of the enterprises that were indebted in dollars. The de-dollarization implied the prohibition of transactions in foreign currency in the banking system, and all the obligations of the banks denominated in dollars (that obviously implied deposits) were given back in Bolivian pesos with an exchange rate 45% inferior to the parallel market (Antelo, 2000). This meant a significant capital loss for the savers and subsequently promoted a process of financial disintermediation and capital

³⁹ These included high import tariffs, import prohibitions for around 500 products, preferential import tariffs for inputs and capital goods for the agriculture sector, and subsidized credits for the productive sectors (Antelo, 2000).

⁴⁰ That was a very important factor when we consider that Bolivian exports were mainly commodities (minerals and fuel, among others).

⁴¹ This loss of net international reserves from 1980 to 1983 was caused mainly by the increase of the short-term external debt. Since 1983, the reserves became positive as a result of the updating of delayed payments for sales of gas to Argentina and the suspension of payments of a part of the external debt service.

outflow. Implicitly, the financial system was harmed for the years to come, in terms of the loss of confidence in it⁴².

The government had no other option than to declare a moratorium on the debt service payment to the international private banks in 1984. This caused more reduction of capital inflows, considering that these international banks cut their credit lines to Bolivia, even short-term lines to finance international trade transactions.

As a consequence of the economic crisis, the bank system also faced a difficult situation. The problems with getting back their loans, the growth of the non-performing portfolio, and the scarcity of internal and external sources of funds were revealing that the banks were not financially sustainable. The case of the state banks was even worse, since even they registered a non-performing portfolio that was greater than their outstanding loans (see Table 3.4).

Table 3.4. Portfolio structure of the Bolivian banking system, 1981-1985 (% of the total)

Years	1981	1982	1983	1984	1985
Commercial banks					
Outstanding loans	80.4	65.9	70.2	74.1	61.0
Non-performing loans	19.6	34.1	29.8	25.9	39.0
State banks					
Outstanding loans	57.2	54.2	50.9	55.4	47.9
Non-performing loans	42.8	45.8	49.1	44.6	52.1

Source: Antelo (2000)

To complicate the macroeconomic situation even more, Bolivia experienced strong internal supply shocks. These were the result of the “El Niño” phenomenon that caused droughts and floods that obviously had negative effects on the agricultural sector. Specifically, this sector suffered a decrease in real terms of 14.2% in 1983. This fact plus a decrease of more than 5% in production by the mining sector led to a GDP decline of about 4% (Antelo, 2000).

Finally, regarding the political scenario, already at the end of the 1970s Bolivia started to experience political instability. This instability was characterized by several civil and military governments that attempted to consolidate the transition towards democracy. However, during these governments the social and redistributive conflicts grew. Therefore, in the economic sphere this meant more pressure to increase the expenditures and transfers from the state to the private sector and consequently to worsen the state of the public accounts.

The stabilization program and the structural reforms of 1985

Given the hyperinflation crisis, beginning in August 1985 an ambitious program of stabilization and structural reforms was carried out. The stabilization policies were based on macroeconomic fiscal, monetary, and exchange rate policies and the relief of the external debt. The common goal of these measures was to promote economic stability and establish the basis for economic growth. The structural reforms were more related to microeconomic policies that aimed to restructure the system of incentives of the economy and to improve the regulatory framework for productive activities. With regard to the incentives, the Bolivian economy opened up to external markets; therefore the market became the main mechanism for economic resource allocation (Antelo, 2000).

3.3.2.2 The New Economic Policy and financial liberalization

Financial reforms under the new economic policy since August 1985

The New Economic Policy applied beginning in August 1985 had two components: one of stabilization and another of structural adjustment. These two components related to different goals. The short-

⁴²It is still possible today to find people reluctant to trust their savings to the financial system, given their fear of a government measure similar to the one of 1982.

term one related to the restitution of the macroeconomic disequilibrium, and the long-term one aimed at the transformation of the economy. Both components of the program implied a deep transformation of the financial system, leading to a stage of financial liberalization.

The financial reforms included in the New Economic Policy aimed to improve the efficiency of financial intermediation and the use of resources (including the allocation of investments). The goal was to reduce the distortions in credit allocation, leaving this allocation to the market. To reach this goal, the normative, regulatory, and supervisory framework reforms played important roles in guaranteeing the stability and solvency of the financial system.

Although the stabilization package was not exclusively designed for the financial system, it succeeded in its goal of stabilizing the economy, establishing a necessary condition for the achievement of any economic activity. In addition, some of the stabilization package policies were related directly or indirectly with the financial system. These policies aimed to deregulate and liberalize the financial system, eliminating financial repression.

One of the first policies was the liberalization of interest rates. The purpose was to reduce the high levels of (active) interest rates and in this way to stimulate saving and private investment in the country. In the same way, in order to promote financial intermediation, the bank reserve rates (legal reserve ratio) were reduced and made uniform. In addition, the strategic role of channeling and allocating financial resources was left to the private financial sector, leaving the government out of credit allocation decisions. This in practice meant restricting the state's banking activity until almost its liquidation (Antelo, 2000).

Another important measure was the reintroduction of foreign currency transactions in the banking system. Additionally, the tasks relating to operations of external trade were returned to the banking system. These operations were until then performed almost exclusively by the Central Bank.

Consolidating financial liberalization through the regulatory and supervisory framework

Despite the application of the above-mentioned policies, it is important to consider that the deregulation of the financial system took place without the presence of a proper regulatory and supervisory framework. It was not until July 1987 that reforms at this level were executed. Therefore, financial liberalization became more solid.

One of the first measures in terms of the normative and regulatory framework was to return independence to the supervisory authority (July 1987). Until then, this supervision had fallen to the Central Bank. Together with this measure, patrimonial requirements and policies on the fortification and capitalization of banks were established (For example, the concept of universal bank was enabled). Additionally, the creation of new mechanisms of supervision and the application of sanctions for financial institutions that act outside of the normative framework were introduced.

Later, from 1993-1997 other important reforms were implemented. Some of these reforms were reflected in the enacting of a new Law of Banks and the Law of the Central Bank. Both laws implied important changes regarding the activities of deposit institutions. Additionally, by means of these regulatory instruments the role of the supervisory authority was re-defined and strengthened. In this period, the creation of new financial institutions was also enabled (mainly microfinance institutions). These new financial deposit institutions that became part of the financial system (i.e. private financial funds)⁴³ later played an important role in terms of inclusive financial services.

In fact, the emergence of non-bank deposit institutions was an important characteristic of the Bolivian financial system after the application of the New Economic Policy. These new institutions under the

⁴³ Supreme Decree 24000 of May 12, 1995 authorized the organization and operation of Private Financial Funds (PFFs). The primary target of such financial intermediaries was the financing of micro and small-sized enterprises in the productive and commercial sectors, traditionally marginalized from bank financing.

figure of savings and loan mutuals, credit unions, and private financial funds (PFFs) represent only around 20% of the total loan portfolio. Nevertheless, the positive evolution and participation of these non-bank institutions in terms of the number of lenders served reflects their importance in terms of allowing access to finance for those agents who were excluded from the bank system. As we can see in Table 3.5, during the period 1999-2010, the non-bank institutions represented around 50% of the total number of lenders.

Table 3.5. Number of lenders by financial institution, 1999-2010 (in %)

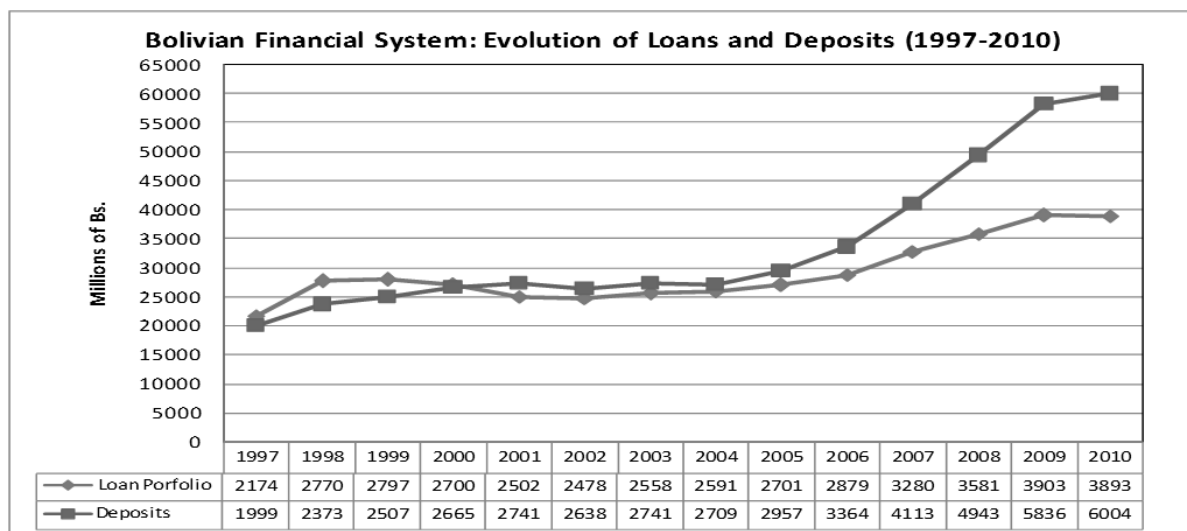
Years	Banks	PFFs	Credit Unions	S&L Mutuals	Total
1999	51.28	26.65	13.89	8.18	100.00
2000	46.67	27.02	17.15	9.16	100.00
2001	50.19	23.69	19.17	6.95	100.00
2002	51.24	29.01	13.52	6.23	100.00
2003	49.97	30.07	14.08	5.88	100.00
2004	43.17	39.43	12.41	4.99	100.00
2005	48.68	31.94	14.45	4.94	100.00
2006	49.49	32.30	13.82	4.38	100.00
2007	48.75	33.80	13.62	3.83	100.00
2008	49.76	36.41	11.38	2.45	100.00
2009	49.05	37.68	10.99	2.29	100.00
2010	48.78	38.00	10.94	2.28	100.00

Source: Author's own preparation on basis of ASFI

Since 1998, other regulatory and normative financial reforms have been mainly destined to strengthen the financial system and to guarantee its stability. In this sense, some complemented and others modified the measures already applied in the previous periods. Additionally, during the period 2000-2001 some specific measures were formulated and applied in order to make the economy more dynamic, given the economic crisis experienced since 1999. This crisis had a significant effect on the financial system in terms of non-performing portfolios and the rationalization of credit. Therefore, some governmental policies allowed the productive, service, commerce, and consumption sectors to reprogram their portfolio. With this purpose, funds were injected into the financial system through the figure of a second floor bank.

As we can see in Figure 3.5, after the economic slowdown that lasted until 2003, the financial system recovered its dynamics. Private financial funds kept growing in terms of loan and portfolio even during the crisis period. In addition, they kept solidly demonstrating that "poor lenders" were good customers even when the time came to pay back their loans. Since 2004 the trend has remained positive for the entire system despite the world crisis. However, it is evident that the difference between deposits and loans requires a more active role by financial intermediaries in the channeling of savings to investment. In the last 5 years, the only institutions that are allocating almost all of their deposits are the microfinance institutions (MFIs). Giving the importance of microfinance in Bolivia in economic and social terms, we will discuss this sector in the next sub-section.

Figure 3.5



Source: Author's own preparation on basis of ASFI

3.3.3 The microfinance miracle

The beginnings of microfinance in Bolivia

The case of microfinance in Bolivia is unique in the world, both in terms of its origin and its evolution over more than two decades. The microfinance industry in Bolivia emerged in the late 1980s in economic and social circumstances that are regarded by some authors (i.e. Rhyne, 2001; Mosley, 2001) as a "fertile seeding-ground" for microfinance operations. Mosley (2001) refers to this fertile ground as characterized by four circumstances: a) the virtual collapse of the formal financial sector, b) deregulated interest rates (financial liberalization), c) growth in the economy, and d) high urban population density, making it possible to expand operations rapidly and at low cost.

These circumstances, which appeared in 1985, derived mainly from the application of a new economic policy, and they favorably transformed the environment for the financial sector in general. In the case of microfinance, both the successes and the difficulties of the adjustments arising from the application of the new economic policy contributed to the development of the microfinance sector.

Before 1985, the banking system in Bolivia was characterized by extreme inefficiency and an inability to reach small savers and lenders.

"Both the three main state-financed banks and the twelve main commercial banks, before 1985, were hampered by the natural instinct of all Bolivians who could engineer it to place their money in overseas accounts at world market interest rates rather than locally at controlled, and in real terms negative, interest rates. The consequent shortage of savings in local currency bred financial conservatism among Bolivian banks and, in particular, a reluctance to embark on high-risk projects such as lending to small farmers or micro-entrepreneurs" (Mosley, 2001, p. 104).

To make the situation worse, the hyperinflation experienced in the Bolivian economy in 1984-85 severely hampered an already weak financial system. Therefore, when microfinance institutions set up operations in the later 1980s, they did so in an environment of widespread mistrust in the formal banking system.

As stated earlier, with the application of the New Economic Policy in August 1985, the Bolivian government laid the foundation of a modern financial sector. At the same time, this economic reform led to favorable conditions for the establishment and expansion of MFIs. First, the stabilization policies succeeded in controlling inflation and liberalizing all prices (including interest rates). A low level of

inflation made it possible for lenders to maintain the value of their assets over time. For their part, liberalized interest rates meant that lenders could compensate for the higher operating costs of small loans by means of higher interest rates. Second, despite the fact that the growth was slow in coming, it has been positive since 1987. Third, the decision of the government to close its inefficient development banks together with the negative effects of hyperinflation on the financial system left a space that was filled by MFIs. Finally, the economic reform introduced in 1985 increased demand for microfinance services, since the number of unemployed workers grew dramatically. Since 1985 and over the course of the next 10 years, the government closed, sold, or shrank a variety of state-owned enterprises, mainly mine and oil companies. The main consequence was a flood of migrants into the main cities. A few were able to find employment in the formal manufacturing and services sector, or in the relief projects established by the government, but the majority found their way into the informal sector. These people became the main clients of MFIs⁴⁴ (Mosley, 2001; Rhyne, 2001).

The first initiatives in the microfinance sector were taken by entities without profit goals (NGOs). The idea was that those institutions would offer credit to those low-income agents. So from the beginning the NGOs had an important role in the finance of low-income households and micro-entrepreneurs that until then had had access to finance only by means of informal sources such as illegal lenders, family, friends, and rotating credit.

The formalization of MFIs

In 1992, with the creation of Banco Sol under the auspices of an existing NGO, the process of formalization of MFIs started. These were established on the basis of the existing NGOs. This process was benefited by the government in 1995 with the issuing of Decree 24000, which lists the norms relating to the creation and functioning of Private Financial Funds (PFFs) as deposit financial institutions specialized in financial services for micro and small agents. In July 2005 Caja Los Andes started operations as the first PFF. After that, other PFFs were created under the auspices of existing NGOs. That was the case of FIE (since 2010 Bank FIE), PRODEM, and ECOFUTURO. Additionally, other PFFs were created by exclusive private initiative (FASSIL, Fondo de la Comunidad, and Fortaleza).

With the formalization of the MFIs, the alternatives for obtaining funds increased in a significant way – and with them, the possibility to become self-sustainable. As formal institutions the MFIs had more chances to get internal and external funds. Additionally, they could benefit in terms of risk evaluation and operation costs through access to the information of the Risk Center, which is part of the supervisory financial intendancy in Bolivia.

The crisis at the end of the 1990s

The entrance into the market by formal MFIs or the exclusive microfinance departments of some already existing financial entities, offering consumption credit, caused an excess credit supply between 1996 and 1999. This excess of supply often led to over-indebtedness by the borrowers, due additionally to the lack of proper credit technologies and personnel to evaluate the payment capacity and debt of the micro-sized enterprises. Furthermore, these institutions applied very aggressive policies in order to win a greater market segment, and then they established incentive mechanisms for their personnel in order to promote allocation of more resources. The problem was that many times this financial allocation did not give proper attention to the quality of the loan portfolio. Its consequence was an increase in the non-performing loan portfolio.

⁴⁴ For organizations that work actively with the informal sector, including MFIs, the agents involved in the informal sector are regarded as micro-entrepreneurs. This perspective stresses the positive role of this sector in the provision of employment and income in the survival and the improvement of the lives of many people by their own efforts and also as a basis of enterprise growth, as some micro-enterprises could grow to become small and even medium-sized businesses (Rhyne, 2001).

Additionally, this credit supply explosion caused a temptation for many people to get loans in different institutions at the same time for amounts that were higher than their payment capacity. When the agents perceived this excess of supply and relatively easy access to credit, they lost interest in paying on time. They followed the premise that if they got a bad name in one institution, another would be able to lend to them.

During the period 1999-2003 the Bolivian economy suffered a crisis that was also reflected in the financial system. This period saw a decrease of micro and small-sized enterprise sales due to the reduction of demand, the devaluation policies of other countries of the region, restrictions on external trade, the eradication of coca, and the application of the new Custom Law.

The period 1999-2002 was the most difficult stage of the crisis for the economy and the financial system. At the same time it was the most difficult period for the microfinance institutions. The situation of over-indebtedness in the case of many micro and small entrepreneurs would not have had grave consequences if their income levels had not been diminished by the economic crisis. However, due to the reduction of the firms' revenues, their payment capacity was affected significantly, and consequently the non-performing loan portfolio of MFIs increased (See Table 3.6).

Table 3.6. Bolivia: Microfinance gross loan portfolio, default portfolio, and net earnings by type and institutions 1990-2004 (in thousands of Bs.)

Period	Loan Portfolio of Microfinance Inst.			Default Portfolio of Microfinance Inst.			Default Portfolio/Loan Portfolio			Net Earnings of Microfinance Inst.		
	Non-		Total	Non-		Total	Non-		Total	Non-		Total
	Regulated	regulated		Regulated	regulated		Regulated	regulated		Regulated	regulated	
1990	10350	0	10350	2	0	2	0	0	0	313	-35	278
1991	22353	1052	23405	166	111	277	1	11	1	689	104	793
1992	53864	6050	59914	1542	251	1793	3	4	3	590	259	850
1993	140935	20679	161614	3919	1033	4952	3	5	3	2312	1565	3877
1994	187601	27086	214687	8936	2006	10942	5	7	5	10123	4448	14571
1995	239056	71547	310603	7314	5205	12520	3	7	4	6940	14396	21337
1996	413662	127410	541072	11965	5202	17167	3	4	3	18524	20515	39039
1997	690963	175667	866630	20312	10603	30915	3	6	4	28796	19484	48280
1998	917529	228160	1145688	52369	14231	66601	6	6	6	41657	39745	81401
1999	1076817	376343	1453159	66040	25099	91139	6	7	6	12727	47258	59985
2000	1258221	413062	1671283	92815	40695	133509	7	10	8	13310	49635	62946
2001	1470548	454291	1924839	142108	53129	195237	10	12	10	3057	38780	41837
2002	1775977	246214	2022191	131104	77318	208422	7	31	10	12655	32069	44724
2004	2996216	789461	3785677	79568	63563	143131	3	8	4	2996216	58908	3055124

Source: Author's own preparation on basis of FINRURAL data

Additionally, in this period associations of small borrowers were created in some departments of the country as a consequence of the economic crisis that harmed many micro and small entrepreneurs. The associations were attempting to get the remission of their debts by means of pressure measures against the financial entities and the government. Such a remission would have meant the end of micro-credit in Bolivia.

The fast recovery of MFIs

Since 2003, despite the persistence of the economic crisis, the microfinance entities have recovered in terms of deposits and loan portfolios and proven to be very solid. This recovery has been even more rapid than in the case of the banks. In this sense, as most of the loan portfolio is in micro-entrepreneurs' hands, they have learned to adapt to the current conditions of the market. Additionally, it seems that micro and small lenders have understood how important is to comply on time with financial commitments. In general, the non-performing loan portfolio of the MFIs was the lowest of all deposit institutions during the period 2003-2004.

Furthermore, the MFIs have made many changes with respect to the traditional way of managing their businesses. These changes have made it possible to manage the crisis and to keep competing in the financial intermediation sector. Among the changes we can point out are: the extension of the market segments also serving the rural population, employees, and small and medium enterprises; greater diversification of their credit products and lines; greater supply of non-credit financial products such as bank giros and national/international transfers, insurance sales, among others; adjustments of credit technologies; a process of expansion to urban and rural areas filling the space left by the traditional institutions; changes in the human resources profile of their employees and administrative personnel; changes in their customer services and greater emphasis on marketing and publicity. All this has had a positive impact in terms of profitability for formal (banks and financial private funds) and semiformal institutions (NGOs).

From 2004 until the present, despite the international crisis, the microfinance industry has continued growing in terms of deposits, loan portfolio, geographical coverage, and number of lenders, among other indicators. During the period 2006-2009, the national supervisory authority launched some modifications in the normative with the purpose of stimulating higher geographical coverage of financial institutions, including the MFIs (by means of the opening of new branches). Additionally, the modifications of the regulative framework have aimed to include all financial institutions in the regulated supervision of the national financial supervisory authority.

The composition of the Bolivian microfinance sector

Currently, the microfinance sector in Bolivia is composed of a variety of institutions, which make this market complex (comparable only to the case of Indonesia). Among the institutions that supply microfinance services in Bolivia are NGOs, credit unions, commercial banks⁴⁵, and private financial funds. All MFIs are private, and there is significant participation by formal financial institutions, which in 2002 represented around 79% of the total microfinance loan portfolio.

As we have seen, the presence of formal financial institutions has been an important characteristic of the microfinance sector since the 1990s. During this time several MFIs that were NGOs became banks or financial private funds (i.e. Banco Sol, Banco Los Andes, PRODEM financial private fund)⁴⁶. In fact, the transformation from NGOs to formal financial institutions is an important issue in the evolution of the microfinance industry in Bolivia.

The importance of NGOs

However, it is also important to mention that there is still significant participation by NGOs in the sector, mainly in the rural areas. In fact, even though non-regulated MFIs represented only around 21% of the microfinance portfolio loan, they represented around 49% of the microfinance lenders and 56% of the lenders in rural areas in 2002 (see Table 3.7). Additionally, in 2008 around 50% of NGO branches were located in rural areas (PROFIN, 2009).

Most NGOs aspire to become financial private funds and then banks when they mature, mainly because they have the expectation of competing more efficiently as formal financial institutions. However, this is not the aspiration of all NGOs involved in the Bolivian microfinance sector, since some of these financial development institutions (i.e. ProMujer) are village banking programs whose goal is to reach the poorest people. This aim is reflected in their low average loan balances, which are about 15 USD. The main reason of these institutions for not becoming formal financial institutions is that as

⁴⁵ Those that are exclusively microfinance banks, as is the case of Banco Sol, Banco Los Andes, and Banco FIE, as well as some mainstream banks that supply loans to micro-enterprises and saving services for some micro-level clients.

⁴⁶ The conversion is not directly from the status of NGOs to banks. Usually, NGOs first become financial private funds, since the minimum capital requirements are lower than those required for commercial banks. So some microfinance formal institutions in Bolivia such as Banco Sol and Banco Los Andes started as NGOs, then later became financial private funds and finally converted into commercial banks.

financial private funds or banks, the supervisory authority would indirectly force them to abandon their commitment to the poorest groups (Rhyne, 2001).

Table 3.7. Number of microfinance lenders by type of MFI & area 1990-2002 (in %)

Years	Regulated institutions			Non-regulated institutions		
	Urban	Rural		Urban	Rural	
1990	100.00	0.00	100.00			
1991	98.78	0.00	100.00	1.22	100.00	0.00
1992	91.38	76.54	23.46	8.62	94.36	5.64
1993	85.62	78.58	21.42	14.38	42.11	57.89
1994	84.66	87.24	12.76	15.34	57.78	42.22
1995	80.37	86.72	13.28	19.63	63.83	36.17
1996	78.51	82.97	17.03	21.49	58.46	41.54
1997	77.83	84.81	15.19	22.17	60.12	39.88
1998	62.47	80.16	19.84	37.53	28.09	71.91
1999	57.53	72.91	27.09	42.47	27.76	72.24
2000	56.66	79.89	20.11	43.34	28.81	71.19
2001	52.81	82.26	17.74	47.19	40.25	59.75
2002	51.11	83.57	16.43	48.89	43.10	56.90

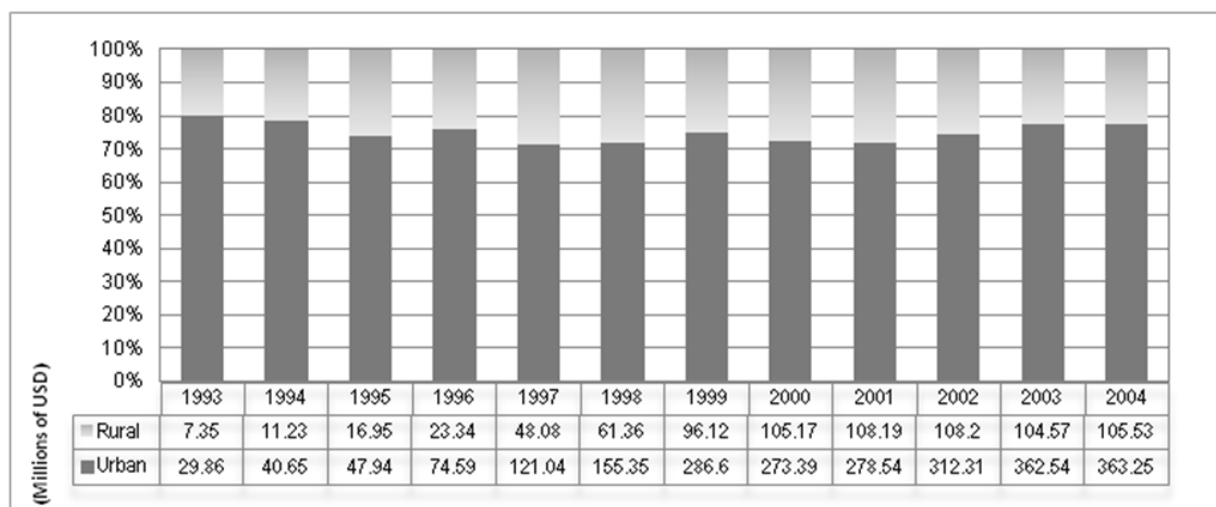
Source: Author's own preparation on basis of FINRURAL data

In 2009 the national authority required NGOs (also known as financial development institutions, or IFDs) and other semiformal institutions such as closed credit unions to get a kind of license extended by this supervisory institution. Such a license permitted these MFIs to keep functioning and to be regulated by the supervisory financial authority. In fact, since 2009 several closed credit unions and NGOs have been incorporated into the regulatory and supervisory framework. As of the end of 2009, there were around 79 institutions, 64 closed credit unions, and 15 NGOs (ASFI, 2010b).

As mentioned, Cull et al. (2009) refers to some trade-offs derived from this transformation. Specifically, one important trade-off relates to regulation and supervision. The study by Cull et al. shows that rigorous and regular supervision is critical for deposit-taking institutions, but it is also costly since this regulatory supervision pushed institutions to serve better customers (i.e. less poor agents) with larger loans in order to maintain profitability. Additionally, supervision appears related to a higher concentration of staff in the head office, reducing the number of staff that work in the branches. Can NGOs and other socially minded institutions survive regulation without redefining their commitment to the poorest? This question has yet to be answered in the Bolivian case.

Limited outreach in rural areas

Finally, in order to have a complete picture of the microfinance industry in Bolivia, it is also important to recognize that MFIs have had a reduced effect in reaching rural "poor" people. Despite the significant presence of financial NGOs in rural locations and the continuous increase of the loan portfolio in rural areas, around 75% of the microfinance loan portfolio corresponds to urban areas (See Figure 3.6). To provide financial services and therefore to ease access to finance in the rural area is still a challenge for microfinance. This challenge becomes transcendental when we consider that about 64% of the rural population in Bolivia lives below the poverty line (See Annex 3.3).

Figure 3.6. Microfinance loan portfolio by area 1993-2004 (in % and millions of USD)

Source: Author's own preparation on basis of INE data

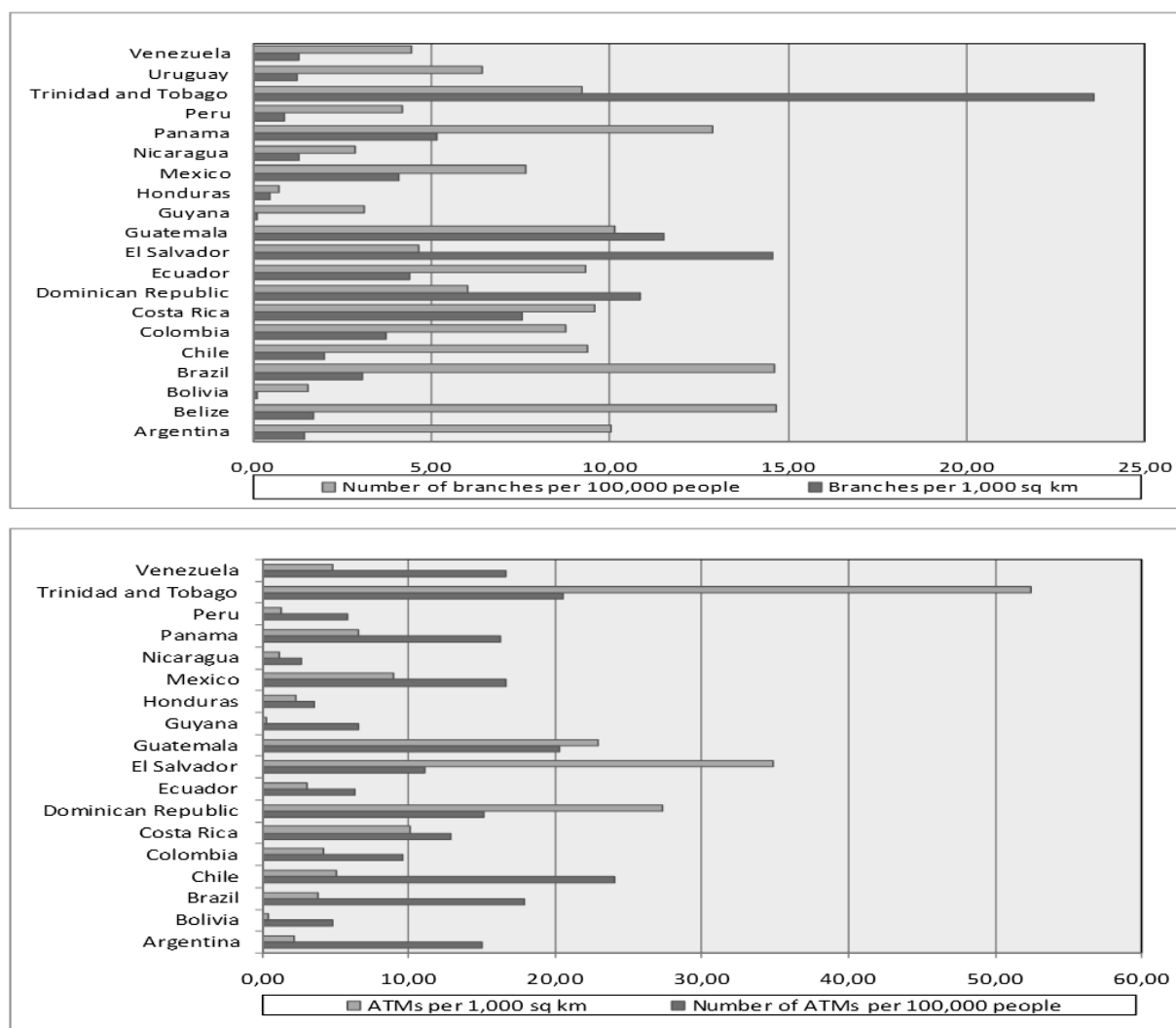
3.4 What Data Say about Access to Finance in Bolivia

Following international cross-country datasets

As said in Section 3.2, there are important limitations regarding international cross-country datasets about access to finance. These attempts at measuring this dimension of finance are recent and refer to the works of Beck et al. (2007), IMF (2010), the CGPA and the World Bank (2010 and 2011) and the World Bank (2012). Beck et al. (2007b) present a consistent dataset of cross-country indicators of banking sector outreach, collected through a survey of bank regulatory agencies conducted in 2003-2004 and complemented with publicly available data for a sample of 99 countries including Bolivia. As indicators of financial development they present data on the number of bank branches and ATMs relative to population and area, to capture the geographic and demographic penetration of the banking system. Higher branch intensity in demographic and geographic terms would indicate higher possibilities of access and the opportunity to use financial services by households and enterprises. The posterior datasets include data about the bank and non-bank branch network, availability of automated teller machines, deposits, loans, debt securities issued, and insurance. Certainly an important improvement of these last new datasets is the consideration of financial access related to non-bank institutions. However, data availability on these non-bank institutions is limited or even nonexistent for most countries. We are referring particularly to the last versions of the Financial Access Survey dataset prepared by IMF and the Global Financial Development Database prepared by the World Bank.

Based on the cross-country data prepared by Beck et al. (2007), Bolivia appears to be occupying one of the last positions in Latin America with respect to access to finance. In fact, as we can observe in Figure 3.7, considering as indicators of access to finance the number of bank branches per 10,000 people and per 1,000 square km on the one hand and on the other hand the number of ATMs per 10,000 people and per 1,000 square km, Bolivia appears to be one of the most limited in terms of access to finance in the region, together with countries such as Honduras, Guyana, Nicaragua, and Peru. However, there is the possibility that this limitation in terms of supply of financial services (at least in Bolivia) is being overestimated, since the available indicators in this cross dataset are limited to measures referring only to bank institutions, while in the Bolivian financial system the role of non-bank institutions seems very important in terms of access to finance (See also Annex 3.2).

Figure 3.7. Latin America and the Caribbean: Indicators of access to finance



Source: Author's own preparation on basis of Beck et al. (2007b)

Building and following indicators that include non-bank and non-regulated financial institutions

Given the limitations of the available cross-data sets, in Table 3.8 we prepared some financial access indicators referring to the case of Bolivia. Non-bank financial institutions were considered in the making of these proxies. In addition to considering the role played by formal and semiformal non-bank institutions in term of access to finance, we have also attempted to evaluate the evolution of financial access over time. In this last respect, the availability of data has allowed us to cover the period 1986-2003.

Table 3.8 shows the evolution of the number of bank and non-bank financial branches in Bolivia. The significant number of non-bank financial branches across the country suggests that these financial institutions are important in terms of inclusive financial services. As we mentioned in Section 3.3, these non-bank institutions have their origins at the end of the 1980s, and since then their supply of financial services – measured by the number of branches – has grown significantly. As we can see in Table 3.8, in 1990 there were five non-bank financial institution branches, while in 2003 there were 461, a number even higher than bank branches. In relative terms, non-bank financial branches in 1990 represented 3.5% of the total of bank and non-bank branches, while in 2003 this percentage was around 65%. Among these non-bank institutions the share of private financial funds (PFFs) and NGOs was significant (See also Table 3.9).

Table 3.8. Bolivia: Evolution of indicators of access to finance (1986-2003)

Period	Number of bank branches	Number of non-bank branches	Number of bank and non-bank branches	Number of bank branches by 100,000 people	Number of non-bank branches by 100,000 people	Number of bank branches by 1,000 square km	Number of non-bank branches by 1,000 square km	Number of bank and non-bank branches by 100,000 people	Number of bank and non-bank branches by 1,000 square km
1986	108	0		1.77	0.00	0.10	0.00	1.77	0.10
1989	142	0	142	2.28	0.00	0.13	0.00	2.28	0.13
1990	138	5	143	2.17	0.08	0.13	0.00	2.24	0.13
1991	156	26	182	2.39	0.40	0.14	0.02	2.79	0.17
1992	183	59	242	2.74	0.88	0.17	0.05	3.63	0.22
1993	249	93	342	3.65	1.36	0.23	0.08	5.01	0.31
1994	244	117	361	3.49	1.67	0.22	0.11	5.17	0.33
1995	278	124	402	3.89	1.73	0.25	0.11	5.62	0.37
1996	285	191	476	3.90	2.61	0.26	0.17	6.51	0.43
1997	276	266	542	3.69	3.56	0.25	0.24	7.24	0.49
1998	323	308	631	4.22	4.03	0.29	0.28	8.25	0.57
1999	334	369	703	4.27	4.72	0.30	0.34	9.00	0.64
2000	355	357	712	4.45	4.47	0.32	0.32	8.92	0.65
2001	257	395	652	3.15	4.85	0.23	0.36	8.00	0.59
2002	230	412	642	2.77	4.95	0.21	0.38	7.72	0.58
2003	241	461	702	2.84	5.43	0.22	0.42	8.27	0.64

Source: Author's own preparation on basis of FINRURAL (2003) and WDI (2010)

Table 3.8 also includes the number of bank and non-bank branches per 100,000 people and per 1,000 square km as indicators of access to finance in Bolivia. Additionally, both indicators are desegregated for bank and non-bank financial institutions. These indicators show that access to finance has had a positive evolution in general terms. However, the disaggregated indicators show that the supply of financial services offered by banks has declined since 2000, while in the case of non-bank institutions the number of branches per 1,000 square km and per 1,000 people has grown continuously.

Table 3.9. Bolivia: Distribution of branches by type of financial institution (in %)

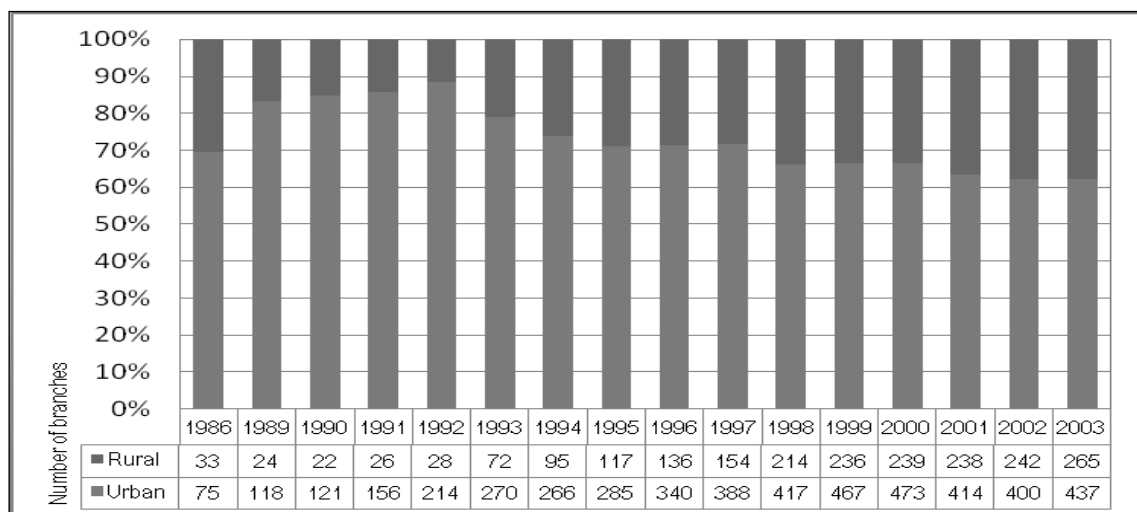
Period	Banks	S&L mutuals	Credit unions	Private financial funds	NGOs	Total non-bank
1986	100.00	0.00	0.00	0.00	0.00	0.00
1989	100.00	0.00	0.00	0.00	0.00	0.00
1990	96.50	0.00	0.00	0.00	3.50	3.50
1991	85.71	9.34	0.00	0.00	4.95	14.29
1992	75.62	8.68	9.50	0.00	6.20	24.38
1993	72.81	7.89	11.99	0.00	7.31	27.19
1994	67.59	6.65	12.47	0.00	13.30	32.41
1995	69.15	5.97	9.45	0.00	15.42	30.85
1996	59.87	5.67	9.45	2.94	22.06	40.13
1997	50.92	6.09	14.94	3.87	24.17	49.08
1998	51.19	5.71	13.79	6.50	22.82	48.81
1999	47.51	5.12	14.65	6.40	26.32	52.49
2000	49.86	5.06	12.64	14.19	18.26	50.14
2001	39.42	6.44	13.96	16.87	23.31	60.58
2002	35.83	7.01	9.35	18.69	29.13	64.17
2003	34.33	6.13	12.25	19.37	27.92	65.67

Source: Author's own preparation on basis of FINRURAL data (2004)

The data reflected in Tables 3.8 and 3.9 shows that access to finance has improved in recent decades and that both banks and non-bank institutions have contributed to this task. However, access to finance is still limited in Bolivia compared to other countries in the region. One important manifestation of this limitation is illustrated in Figure 3.8. Around 70% of the financial institution

branches are concentrated in urban areas. The only financial institutions that have more than 50% of their branches in rural areas are the financial NGOs and some credit unions (See Figure 3.9 and Annex 3.4). It seems that NGOs are playing a central role in terms of extending the supply of financial services to rural areas. However, we are aware that this role has its limitations since NGOs are not self-sustainable and their financial services are focused on credit allocation⁴⁷.

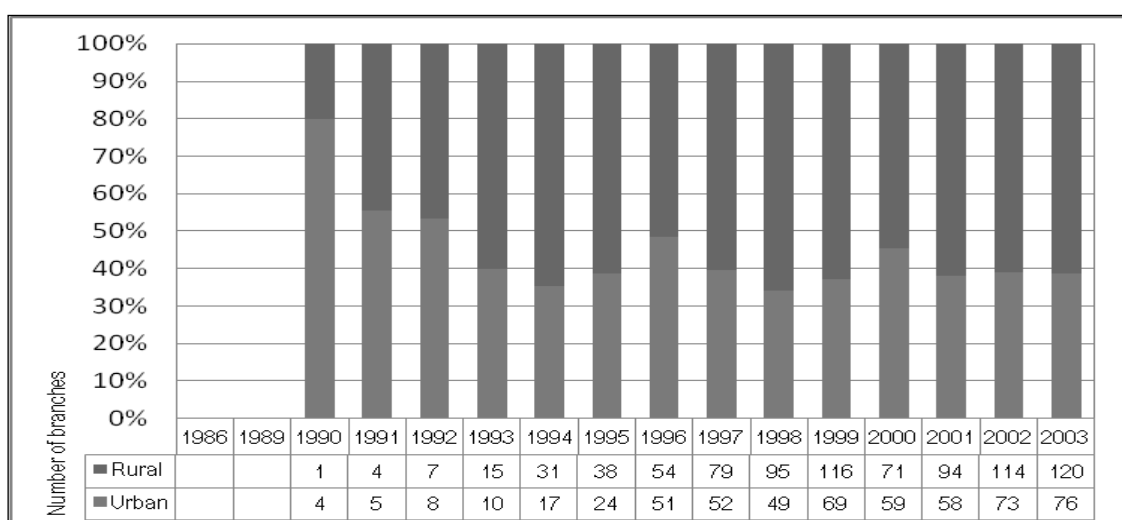
Figure 3.8. Bolivia: Number of branches of bank and non-bank institutions by area (1986-2003)



Source: Author's own preparation on basis of FINRURAL data (2004)

The limited access to finance in Bolivia is also revealed in more detailed data. Specifically, statistics on the number of financial institution branches (formal and semiformal) per municipality show that in 2008 around 55% of the 327 municipalities in Bolivia did not have access to financial services offered by formal institutions or by semiformal institutions⁴⁸. Therefore, in those municipalities it is highly probable that pure informal credit sources (lenders, rotating credit, family, and relatives) would be the only option in terms of the financial services supply (See Annex 3.5 and Annex Figure 3.1).

Figure 3.9. Bolivia: Number of NGO branches by area (1986-2003)



Source: Author's own preparation on basis of FINRURAL data (2004)

⁴⁷ Some NGOs also offer some training programs and technical support in addition to supplying credit.

⁴⁸ In 1998 the situation was more dramatic – only 29% of the municipalities had financial services, while this percentage grew to 36% in 2003 (FINRURAL 2004).

3.4.1 Recent regulatory measures related to access to finance

During the period 2006-2009 the national supervisory authority issued some rules whose purpose was to extend the supply of financial services across the country.

One of the first regulatory measures enacted in 2006 was “the mandate of intermediation.” By means of this rule, a financial intermediary (the principal) could contract any non-financial natural or juridical person (agent) to carry out some specific financial operation and services within a determined territory (i.e. municipality, city) and time. All the activities executed by the contracted agent were under the exclusive responsibility of the principal. In this sense, it seems that the purpose was to ease the supply of financial services for financial institutions in a determined territory by contracting an agent (i.e. a micro-market, a drugstore) that was already established there, without the need to open a new branch.

Another measure established in 2007 was the transformation and re-launching of a second floor bank already established in 1995 by the Law of the Central Bank. As a second floor bank, the Banco de Desarrollo Productivo (BDP) cannot allocate credits directly but rather by means of deposit institutions. The purpose is to promote the financing of productive and rural initiatives.

Finally, in 2009 the regulations related to the opening, removal, and closing of branches and other customer service points were modified. The procedure was improved and the concept of “moving branches” was introduced, with the purpose of promoting the supply of financial services in rural areas by means of this type of branches. Also in 2009 the regulatory disposition to incorporate NGOs and closed credit unions under normative regulatory supervision was launched, and it has been executed since 2010.

3.5 Methodology and Data

Methodological strategy

The present research has two main research components: a review of theoretical and empirical literature related to our research problem and our own empirical work regarding the case of Bolivia.

We have started by establishing some theoretical and empirical considerations based on the existing literature. The main purpose of such a review has been to find some preliminary answers to our research question. Additionally, this theoretical and empirical reassessment has been useful in determining the proper concept of financial access and orienting the measurement of this financial dimension. A main conclusion of this literature examination is that while theoretical models focus on the importance of access to finance, most empirical literature has been built on indicators of financial development. This fact is principally explained by the lack of data regarding access to financial services.

Our empirical work is based on two approaches: a contextual analysis of the Bolivian financial system, presented already in the previous section (3.3), and a pure cross-sectional econometric study. The results of this econometric analysis are presented in the next section.

The contextual analysis

In light of the particular characteristics of our single country study, we have considered it important to examine the context in which the financial system operates in Bolivia. In this diagnosis various dimensions of the financial intermediation in Bolivia such as financial structure, financial development, and institutional diversification have been considered.. Additionally, two issues that seemed closely related with access to finance in Bolivia were also part of this contextual analysis. One is the transition

of the Bolivian financial system from repression to a liberalized scenario, and the second issue is microfinance, which is quite particular and relevant in the case of Bolivia.

The cross-sectional analysis based on sub-national data

The other main element of our empirical analysis is based on cross-sectional econometric techniques to assess the impact of financial access on growth and poverty, using data at a sub-national level, specifically at the municipality level.⁴⁹ The important differences between Bolivian municipalities regarding social, economic, and financial aspects are the reason for this data choice. This fact is relevant if we consider that heterogeneity between individual observations is a key condition for statistical and econometric analysis. In general, sub-national variation among administrative units seems the most readily available strategy to approach a single country study.

International studies such as Dell and Acemoglu (2009) show that within Latin America, cross-municipality differences in incomes are greater than cross-country differences. Disparities in physical capital across municipalities seem unlikely to be the primary factor explaining these differences, due to the relatively free mobility of capital within national boundaries. In any case, the authors stress the importance of local differences in production efficiency and human capital, which are likely determined by local institutions.

A significant advantage of working with sub-national over cross-country studies has to do with data comparability. It is evident that data are more comparable within a country than across countries. While the comparison of institutional and political features across countries can be hard because of the diversity in historical experiences, cultural norms, and institutional contexts, sub-national data can control for such contexts and stress specific aspects of the institutional (i.e. financial institutions) and political system (Hassan et al., 2006).

Additionally, the use of municipality data increases the likelihood of homogenous data compilation methodologies and expands considerably the number of observations (in this case, around 314). Annual data on indicators of access to finance, growth, and poverty at a country level would imply few observations⁵⁰. The yearly data necessary to build financial access indicators at the national level would be available only for the period 1986-2012. Additionally, if we regard that economic growth is a long-term phenomenon, we should average the data for every 4 or 5 years, which would result in even fewer observations.

Although a sub-national study could offer important advantages, we should also consider its disadvantages. Two important limitations concern generalizability and interdependence. The generalizability problems emerge from the fact that all sub-national cases correspond to a single country. So, despite the fact that a within-country approach could allow us to control historical, ecological, and cultural conditions, this strategy often implies a trade-off between the ability to gain control and the ability to generalize. In the case of interdependence, it is probable that we would be constrained to treat sub-national units as independent observations (Snyder, 2001).

Data sources

Our database at the municipality level was collected and prepared on the basis of national sources. The indispensable data for the elaboration of financial access proxies comes from FINRURAL and various municipality datasets prepared for the National Institute of Statistics (INE)⁵¹ in Bolivia with

⁴⁹ Currently, municipal data is of increasing relevance due to the fact that Bolivia has experienced a process of administrative decentralization since the end of the 1990s. This delegation gives more decision-making and planning space to the municipalities. The Bolivian strategy of poverty reduction applied since 2001 has viewed the municipalities as the development units of Bolivia. Therefore, the resources have been delivered by municipality according to its degree of poverty (Vargas, 2004).

⁵⁰ In general, there is a lack of sufficiently long time series data for developing countries.

⁵¹ The abbreviation corresponds to its name in Spanish: Instituto Nacional de Estadística (INE).

available information from the 2001 census⁵². Although a new census was carried out in November 2012, its results at the municipality level had still not been disclosed as of the end of 2013. Data on measures of economic growth, poverty, and other variables explaining growth and poverty come also from INE and the Analysis Unit of Economic Policy (UDAPE)⁵³. Additionally, in the particular case of some geographical indicators such as elevation, ecological region, precipitation, and temperature that are considered as part of the set of control variables, due to the lack of availability of quantitative or qualitative datasets, data has been extracted and systematized from departmental maps where information about demographic, geographic, socio-economic, and health aspects is referenced geographically at a municipality level⁵⁴.

Models, variables, and indicators

The two basic regression models to be estimated by cross-sectional data techniques are summarized in equations (1) and (2). Equation (1) points to the relationship between access to finance and growth, and equation (2) reflects the relationship between access to finance and poverty.

$$Y_{it} = \beta_0 + \beta_1 FA_{i(t-1)} + \beta_2 CV_{i(t-1)} + e_{it} \quad (1)$$

$$P_{it} = \alpha_0 + \alpha_1 FA_{i(t-1)} + \alpha_2 CV_{i(t-1)} + e_{it} \quad (2)$$

In model (1), the dependent variable (Y_i) is an indicator of economic growth. The explanatory variables are FA and CV. FA is an alternative measure of financial access (lagged one period), and CV is a set of variables that in addition to access to finance explain economic growth (control variables). The indicator of financial access is lagged one period to fix the causality reversion problem (since economic prosperity could also influence financial services outreach and other control variables such as human capital or life expectancy), although it does not fully prevent endogeneity. The inclusion of other variables influencing economic growth corrects for other, probably more important, non-financial determinants of economic growth such as geographical conditions across municipalities.

Although our growth and poverty equations have been formulated by lagging both the financial access and the control variables, the availability of data allowed this to be done only partially. In the case of the access to finance indicators there are some particular institutions in Bolivia (i.e. FINRURAL) that have periodically collected information about financial outreach across municipalities since the year 2000. So, given the relative availability of data across time, the lagging of our financial access proxies has not been a problem. However, in the case of the control variables most information about demographic and socio-economic indicators at the municipality level is only available at the census level. In the case of Bolivia, although the last census took place at the end of 2012, data at the municipality level has not been disclosed yet. Most data at the municipal level is available from the previous census of 2001. And a few socio-economic indicators such as the income and the human development index by municipalities have been estimated for the year 2005 by the Bolivian National Institute of Statistics on the basis of household surveys and some demographic projections.

Specifically, having the data about income for the years 2005 and 2001 allowed the elaboration of an indicator of growth in terms of output variation. Therefore, in the equation of growth in terms of output change, both financial access and control variables were lagged one period. In the case of the

⁵² The last census in Bolivia with data available for this study took place in 2001. A new one was executed in November of 2012, but its results at the municipality level had still not been disclosed as of September 2013.

⁵³ The abbreviation corresponds to its name in Spanish: Unidad de Análisis de Política Económica (UDAPE).

⁵⁴ Specifically, we have used the atlas prepared periodically by the Bolivian Ministry of Health (Ministerio de Salud y Deporte) and the Pan-American Health Organization (Organización Panamericana de la Salud). This publication is available for the nine departments that are part of Bolivia (Pando, Beni, Santa Cruz, Chochabamba, Chuquisaca, Tarija, La Paz, Potosí, and Oruro), and in addition to containing geo-referenced data about health variables, it also considers information about geographical, demographic, and social aspects of every department at the municipality level.

growth equation expressed in terms of level of output and the poverty equation, data availability allowed only the lagging of our financial access proxies.

The growth equation

For the economic growth variable, two different proxies are used: one expressed in terms of output level and another expressed in terms of variation. Endogenous growth theories consider finance as a factor affecting growth both in terms of output level and output change. For the output level, the available indicator at the municipality level is the GDP per capita of 2001 expressed in PPP terms, and for the output change, the only existing option is the income variation between 2001⁵⁶ and 2005. In the case of the output level as a dependent variable, the econometric estimations aim to determine if access to finance and other non-financial variables are explaining the differences of output between municipalities. Regarding the output change as a dependent variable, the estimations aim to analyze the effect of financial access and other variables on output variations.

Regarding the set of control variables, we collected and prepared data for indicators such as: human capital, population growth, fertility rate, life expectancy at birth, ethnological fractionalization, and other factors that theoretically would have an impact on growth (based on Barro, 1997).

Although the convergence hypothesis is a key issue in growth theories, we did not consider the estimation of convergence in our output change regressions. While it would have been possible to estimate the absolute convergence coefficient at the municipality level given the data availability of the income variation between 2005 and 2001 and the initial income, we do not think that the assumption of the same convergence rate for every municipality is realistic. As modern growth theory suggests, we should include spatial effects (spatial dependence and spatial heterogeneity) in order to capture differences in convergence across space. However, the calculation of these local convergence coefficients is not possible by the Ordinary Least Square (OLS) method. This task demands the use of spatial econometrics methods and specific additional data (i.e. distance between municipalities) at the municipal level, which is not the case of the present study.

Additionally, given the apparent relevance of geographical variables explaining output levels, growth rates, and poverty between and within municipalities, we have included several geographical indicators. These are: 1) two dummy alternative indicators to capture urban-rural differences between municipalities (one categorizing the municipalities as urban and rural and another classifying the municipalities as big urban, small urban, and rural); 2) a dummy proxy in order to identify the ecological region of the municipality (Highlands, Valley, and Lowlands); 3) an indicator reflecting the minimum elevation; 4) an indicator measuring the average temperature registered in the municipality; and 5) a proxy for temperature.

The importance of geography's influence on socio-economic aspects (i.e. growth rate, poverty, inequality) of countries, municipalities, and other regional units has been recognized by empirical literature. Among these studies are those by Dell, Jones, and Olken (2008 & 2009), Morales, Galoppo, Jemio, Choque, and Morales (2000), and Vargas (2004). In the case of Dell et al. (2008 & 2009) the empirical evidence is based on international data, and in the case of Morales et al. (2001) and Vargas (2004) the empirical work is about Bolivia.

Dell et al. (2008) use annual variation in climate to examine the impact of temperature and precipitation on national economies. Based on panel data regressions, the authors find that higher temperatures substantially reduce economic growth in poor countries. Higher temperatures appear to reduce not only the level of output but also the growth rates. Additionally, higher temperatures have

⁵⁶ Despite the fact that we are studying the case of a specific country (Bolivia), there are differences in the level of price between departments and municipalities, so that is why the per capita GDP is expressed in PPP terms.

wide-ranging effects, reducing agricultural and industrial output, investment, innovation, and political stability.

The paper of Dell et al. (2009) also analyzes the climate-income relationship. However, one of the main novelties in this work is the cross-sectional evidence obtained by considering the temperature-income relationship using not just cross-country data but also sub-national data at the municipal level (for 12 countries in the Americas including Bolivia). At this level, the authors regress mean municipal labor income on municipal temperature and precipitation and add additional geographic controls for elevation, slope, and the distance from the municipality to the sea. Their results show that a negative relationship between income and temperature exists when looking within countries, and even when looking within municipalities. Additionally, the five explanatory geographical variables included in the regressions (temperature, precipitation, elevation, slope, and distance to the sea) appeared to explain around 60% of the variation in municipal income across these 12 countries.

Regarding the studies concerning Bolivia, the purpose of the work of Morales et al. (2000) is to identify the main relationship between economic development and geography at the province level in Bolivia. To achieve this, they study simultaneously the relationship between an indicator of poverty (index of unsatisfied basic needs, NBI) and GDP per capita with geographical, demographical, institutional, and structural economic variables. One of the main findings of the research of Morales et al. is that geographical variables such as elevation and urbanization matter in the explanation of poverty, labor income, and GDP per capita disparities between municipalities. Similar findings were established by the research of Vargas (2004), which shows, based on municipal data analysis, that the location of the municipalities is important in determining their poverty levels.

The poverty equation

For equation (2), the explained variable is a 2001 measure of poverty, and the explanatory variables are: an alternative indicator of access to finance (FA) and a set of variables that also impact poverty besides access to finance (CV). This set of control variables includes human capital, ethnological fractionalization, initial per capita income, fertility rate, and geographical municipality characteristics. As in equation (1), our alternative proxy of financial access is lagged one period (2000), considering the possibility of reverse causation. It is possible that financial institutions would consider expanding their supply of financial services in municipalities with low poverty levels.

Since there is no international consensus about a unique method to measure poverty, we have used two alternative proxies for poverty. One is the percentage of poor population calculated by the unsatisfied basic needs method, and another is the percentage of poor population estimated by means of the high poverty line method. These two methods are the ones most often used to measure poverty. The method of unsatisfied basic needs considers a set of indicators related to structural basic needs (housing, education, health, public infrastructure, etc.). The poverty line method uses income or consumption as welfare measures. It establishes the per capita value of a minimum subsistence consumption basket that permits the differentiation of poverty levels.

Measuring financial access

A crucial point was related to the preparation of financial access indicators, since the challenge is that these proxies capture the access dimension of finance. Beck et al. (2008c) defines broad access to financial services as an absence of price and non-price barriers to the use of financial services. This does not mean that all households and firms should be able to borrow unlimited amounts at prime lending rates or transmit funds across the world instantaneously. Even if service providers are keenly competitive and employ the best financial technology, prices and interest rates charged and the size of loans and insurance coverage on offer in a market economy will necessarily depend on the creditworthiness of the customer. Therefore, improving access to financial services means improving the degree to which financial services are available to all at a fair price.

Usually it is easier to measure the use of financial services since use is observable; however, use is not always the same as access. Access essentially refers to the supply of services, whereas use is determined by demand as well as supply. Despite having access to finance, some people might decide not to use it due to cultural reasons or because of opportunity costs that are too high (Beck et al., 2008c).

Regarding financial access, Beck et al. (2007b, 2008a, 2008b, and 2008c) introduce two types of measures in terms of access to financial institutions' physical outlets. One type of measures refers to geographical penetration, and the other type of indicators reflects demographic penetration⁵⁷. Higher geographic penetration would mean smaller distance and easier geographical access in relation to financial intermediaries. Higher demographic penetration would suggest that there are fewer potential clients per branch and consequently reflects easier access.

Both types of indicators are presented in the international cross-country datasets prepared by Beck, Demirgüç-Kunt and Martinez (2007b), the IMF (2013), the Financial Access Reports for 2009 and 2010, prepared by the Consultative Group to Alleviate Poverty (CGAP), and the Global Financial Development dataset, recently prepared by the World Bank. However, in general an important limitation of these datasets is to consider only bank institutions or only formal institutions, while in the case of some countries such as Bolivia, the role of non-bank institutions and particularly semiformal ones seems important in terms of access to finance.

Our financial access proxies

In light of the indicators used in the international cross-country datasets and the availability of data, information about the number of financial institution branches per municipality was collected. Given the importance of non-bank institutions (formal and semiformal) in Bolivia, data about this type of financial institutions was considered too.

The total number of branches of financial institutions (bank and non-bank, formal and semiformal) per municipality was used as an indicator of geographical penetration (Access), since it reveals the physical presence of financial institutions. Access to finance essentially refers to the supply of financial services, as the existence of financial institution branches in a municipality is an indicator of the existence of a financial services supply.

Since a size effect of municipalities in terms of land and people is likely in terms of the supply of financial services, an additional geographical penetration measure (Access-area) and two demographic proxies (Access-pob and Access-adult) were calculated. The Access-area indicator measures the number of financial institution branches per 1,000 square km, while our demographic indicators reflect the number of financial institution branches per 10,000 people in one case and in another the number of financial institution branches per 10,000 adults. This last demographic indicator was introduced under the logic that financial services are not available for people of all ages. In addition, we have prepared three kinds of disaggregated alternative measures (geographical and demographic) of financial access. One type of these proxies indicates the availability of financial services supplied by formal financial institutions such as banks, private financial funds, and open credit unions (formal, formal-area, and formal-adult). Since the role of semiformal institutions seems important in terms of access to finance, another type of indicators exclusively measures the supply of financial services by semiformal institutions such as NGOs (denominated since 2010 as development financial institutions) and closed credit unions (semiformal, semiformal-area, and semiformal-adult). Finally, in another category of proxies we have exclusively considered the supply of financial services of microfinance

⁵⁷ Indicators of geographic penetration introduced and collected for Beck et al. (2007b, 2008a, 2008b, and 2008c) are: number of bank branches per 1,000 square km and number of bank ATMs per 1,000 square km. The measures of demographic penetration are: number of bank branches per 100,000 people and number of bank ATMs per 100,000 people.

institutions (microfinance, microfinance-area, and microfinance-adult). These microfinance access indicator proxies made it possible to establish some empirical evidence about the effects of microfinance on economic growth and poverty in Bolivia.

Possible shortcomings of our financial access indicators

Although our financial access indicators are comparable with those of international cross country datasets, there is the possibility of some shortcomings. One limitation relates to the fact that within a country there are not significant mobility restrictions (apart from distance) between provinces or municipalities. So the fact that in a specific municipality there is no presence of financial institution branches does not necessarily mean that financial outreach for the individuals of this municipality is zero. It is likely that households and firms look for financial services in other near or even far municipalities, since major cities could offer more options in terms of financial services.

Another possible deficiency relates to the fact that our access proxies do not capture size characteristics and the sort of services supplied by the financial institution branches. An example might be the case of a municipality with the presence of one large financial institution branch in comparison with another where there are five small financial branches. However, it is possible that in the municipality with one financial branch the supply of financial services is equal or even higher than in the case of the municipality with various small financial branches.

Additionally, it is likely that our disaggregated financial access measures that regard separately the financial services supplied by formal, semiformal, and microfinance financial institutions are strongly correlated with our aggregate measures of access to finance, which are the total number of financial institution branches, and the total number of financial institution branches per 1,000 square km and per 10,000 people (adults). If this is true, it is possible that both aggregate and disaggregated financial access proxies are measuring the same thing, financial access in general.

Evaluating the effect of microfinance on growth and poverty

Although the main focus of the present research is not microfinance, the contextual analysis of the financial intermediation in Bolivia suggests that microfinance is a transcendental feature of the Bolivian financial system and it could play a part in terms of economic growth and poverty reduction in the country. Therefore, our cross-sectional analysis also aims to evaluate the effect of financial services supplied by microfinance institutions on growth and poverty.

Our study redirects the attention to macro studies in this field by means of a single country study. As mentioned, most of the empirical literature regarding the socio-economic impacts of microfinance is based on micro level approaches (i.e. randomized control trials, financial diaries, and/or portfolios of the poor and the use of other variants of quasi-experimental estimation techniques). Evidence from such micro-studies is mixed mainly due to different microfinance outcome measures and/or different methodologies adopted by these studies, leading to the perception that microfinance is likely to have little impact on poverty. Our econometric analysis aims to find some evidence based on data for a whole country.

One of the challenges for empirical macro studies on the impacts of microfinance is to identify available measures of microfinance activities. In our case, we have three microfinance indicators given by the absolute number of microfinance branches, the number of microfinance branches per 1,000 square km and the number of microfinance branches per 10,000 adults.

Other econometric considerations and possible limitations of the econometric analysis

Regarding the econometric analysis, we have to make sure that they follow some basic properties. In this sense, in the estimated models we look for statistically highly significant coefficients based on the probability of the t-statistic at different significance levels (1%, 5%, and 10%). Also, in order to

warrant a high goodness of fit, our estimations should have a high value of R-square (simple and adjusted) and the statistic F should be significant at least at a level of 5%.

Additionally, it is important that the estimated parameters follow the basic assumptions of ordinary least square estimators. Therefore, we also have to discard the presence of autocorrelation, multicollinearity, and heteroskedasticity⁵⁸ in the estimated models. Autocorrelation was practically discarded since it is more a typical problem of time series analysis. In the case of multicollinearity, we have prevented this problem by not including in the estimations all explanatory variables (control variables) at once⁵⁹ since there is the possibility that some control variables are highly correlated. To mention a few cases, the elevation indicator appears to be highly correlated with temperature and precipitation, while our indicator of human capital (education) appears to be negatively correlated with the fertility rate. Finally, considering that the probability of finding heteroskedasticity in cross-sectional models is very high, after verifying the presence of heteroskedasticity⁶⁰, the estimations are replaced by their corrected robust version.

Moreover, there is the probability that our econometric estimations are biased because of endogeneity. Although various instruments (i.e. legal origin, governmental commitment to macroeconomic stability, corruption and financial repression, banking sector concentration) have been used so far in the cross-country finance-growth empirical studies to deal with this problem, we must be aware that in a single country study at a sub-national level, most of these employed instruments are either not relevant or not available.

In fact, the instrumental variable approach is not a feasible endogeneity solution in our econometric analysis, given important data constraints at the municipality level or the impracticality of certain instrumental variables at this disaggregated level. However, by lagging one period the financial access variable both in the growth and poverty regressions we have tried to prevent reverse causation and then to solve – at least partially – the endogeneity problem. Additionally, we should note that studying a single country using regional (municipal) data helps to address the omitted variable problem, which is another typical cause of endogeneity⁶¹.

Finally, we should regard the possibility of spatial dependence in two ways. First, the economic growth of each municipality would be influenced directly by the economic growth of neighboring municipalities. Second, there may exist also spatial heterogeneity, where municipalities do not directly affect each other, but neighboring municipalities are similar in various features. For example, a municipality may be similar to its neighbors in aspects such as weather or soil, so that the municipality agricultural production is likely to show a similar pattern to that of its neighbors (Majumder & Eff, 2012).

Given this situation, spatial models would be a better way to approach the econometric analysis. However, we should consider that minimally we should introduce among the explanatory variables a matrix (of 314 x 314) that registers the distances between municipalities. Unfortunately, this type of information was not available at the municipality level.

⁵⁸ This problem implies that the error terms in the model are no longer independently and identically distributed (homoskedasticity). In such cases, the OLS estimators may still be unbiased or consistent, but they will lose efficiency and no longer be the best linear unbiased estimator (BLUE property).

⁵⁹ Therefore, we have some alternative estimated models where the variations are some control variables and in some cases also the proxy of access to finance. This task also contributes to the robustness of the results.

⁶⁰ The Breusch Pagan test was used for this purpose.

⁶¹ This advantage of single country studies based on disaggregate (regional) data is also highlighted in recent works such as Kendall (2009) and Majumber and Eff (2012), which examine the impact of financial development on growth for the cases of India and Bangladesh, respectively.

3.6 Results and Discussion

Below, the econometrics results about the relationships between access to finance and economic growth on the one hand and poverty reduction on the other are presented. As stated previously, the econometrics analysis is based on data from around 314 municipalities in Bolivia. The specification of the regression models for growth and poverty take into account geographical features as an important control variable. Two types of equations of growth were estimated, one in terms of output level and another in terms of output (income).

The descriptive statistics for the whole sample are presented in Annex 3.6. These statistics include the number of observations and the mean, standard deviation, and minimum and maximum values of each variable in the sample. As expected, descriptive statistics show important socio-economic and geographical differences between Bolivian municipalities.

Additionally, in Annexes 3.7, 3.8, and 3.9 three correlation matrices are presented. The first two relate to some specific explanatory variables, and the last (Annex 3.9) regards the complete dataset. Annex 3.7 shows the correlation matrix of geographical variables. It is known that above the level of the sea in the Andean region, elevation determines temperature and precipitation. It suggests that the variable altitude in the case of Bolivia serves also to summarize and represent the influence of other geographical variables such as temperature and precipitation. This is precisely proven in our pairwise correlation analysis that reveals strong correlation coefficients between these three geographical variables. The strong association between two other geographical variables, namely altitude (elevation) and the variable lowlands (one of three ecological regions present in Bolivia besides highlands and valleys), is another correlation between geographical variables to be considered in the regression analysis in order to avoid multicollinearity problems.

The other specific correlation matrix (Annex 3.8) is the one presenting pair-wise associations between our aggregated and disaggregated indicators of financial access. As expected, our aggregated measures of financial access are strongly correlated, showing that all of them are measuring the same thing (access to finance) and that they could be used as alternative financial access proxies. However, it came to our attention that our disaggregated financial access measures that regard separately the financial services supplied by formal, semiformal, and microfinance financial institutions appeared to be strongly correlated with our aggregate measures of access to finance. Although these strong associations between aggregate and disaggregated financial access proxies could be expected, since formal and semiformal financial institutions are part of the Bolivian financial system, it is possible that both aggregate and disaggregated financial access proxies are just measuring financial access in general. Therefore, the econometric results regarding disaggregated financial access indicators should not be considered as totally robust and should not lead to definitive conclusions.

This particular correlation problem and other potential shortcomings of our econometric analysis, already referred to in the previous section, could diminish the robustness of our results in general. However, we believe that despite these possible limitations, our econometrics complemented with the contextual analysis of the Bolivian financial system could give some insights and preliminary answers to our research problem.

In general terms, the results summarized throughout this section show that access to finance in Bolivia is pro-growth and pro-poor. Additionally, regarding the access to financial services offered by microfinance institutions and particularly by semiformal financial institutions (NGOs and closed credit unions), we found econometric evidence that suggests that microfinance and particularly semiformal institutions play a role in the promotion of growth and poverty reduction. However, as Honohan (2004b) established, it is important to keep in mind that not all microfinance services are directly related to the poor. Therefore, the effect of microfinance on poverty reduction could have some limitations, and more if we regard that microfinance financial institutions (except NGOs) in Bolivia

seem to serve “urban poor” better than “rural poor”. The case of semiformal MFIs, mainly NGOs, is different if we consider that they have more presence in rural areas. Additionally, we must consider some limitations of our econometric analysis. In any case, we believe that further studies are necessary in order to determine the effect of microfinance on growth and poverty reduction in Bolivia.

3.6.1 Access to finance and economic growth

Tables 3.10 A and B and Table 3.11 summarize the econometric results regarding the relationship between access to finance and economic growth both in terms of output level and output change, respectively. For all the estimated regressions, the values and probabilities of the t-statistic of the estimated coefficients for the explanatory variables (access to finance and control variables) are presented. The value and the probability of F are also reported, as well as the value of the R-square.

As we can see in Table 3.10 A and part of Table 3.11, access to finance was measured by four alternative proxies denominated in our estimations as Access, Access-area, Access-pob, and Access-adult. The first one refers to the total number of financial institution branches in absolute terms, while the second is the number of branches per 1,000 square km. The last two proxies are more demographic, showing the number of financial institution branches per 10,000 people and per 10,000 adults, respectively.

The estimated regressions that consider disaggregated financial proxies (Formal, Formal-area, Formal-adult, Microfinance, Microfinance-area, Microfinance-adult, Semiformal, Semiformal-area and Semiformal-adult) attempt to capture the particular role of formal, semiformal, and microfinance institutions on economic growth, and they are presented in Tables 3.10 B and part of Table 3.11.

In all the estimated growth regressions, in addition to an alternative indicator of access to finance, a set of control variables is included as explanatory variables. In the results presented in Tables 10 A and B, the explained variable is the real per capita GDP of 2001 in its natural logarithm form. Therefore, the estimations reflect the factors that explain the differences in output levels between municipalities. In the case of Table 3.11, the economic growth proxy is the variation of income between 2001 and 2005, as an indicator of output change. In that way, the calculated regressions in Table 3.11 show which variables explain the output changes across Bolivian municipalities.

Consistently with one of the pioneering sub-national studies (Guiso et al., 2004) our estimated growth regressions suggest that higher (local) financial access promotes growth. The results imply that greater outreach by financial institutions could influence positively on municipality output levels and also on its growth rate. Similar results are shown in the study of Kendall (2009) about India demonstrating that districts with greater banking sector outreach grow faster.

Estimations of economic growth in terms of output level

Considering our estimations in terms of output level (Table 3.10 A), in all regressions the coefficients of our alternative financial access measures reported a positive sign and a high level of significance. This evidence suggests that access to finance is a growth factor in terms of output level in the case of Bolivia. The results remained robust for different measures of financial access (Access, Access-area, Access-pop, Access-adult).

Additionally, as we can see in Table 3.10 B disaggregating financial access in formal and semiformal institutions, there is evidence that highlights the importance of the financial services supplied by both type of financial institutions in the country. In addition, regarding the estimated coefficients of our indicators of access to financial services offered by MFIs, it seems that microfinance is pro-growth. However, we should be cautious about these results given some possible shortcomings of our indicators and the econometric analysis) and the necessity for further empirical research.

To complement our analysis there are also some interesting findings regarding the growth control variables. In this sense, as it is predicted by classical and endogenous growth theories, we found that a high fertility rate (as an indicator of population growth) has a negative impact on economic growth. Additionally, consistent with international cross-country studies (i.e. Barro, 1997), our estimations at the municipality level show that ethnological fractionalization is a reason explaining low levels of output while higher levels of education and higher life expectancy play a positive role in output levels.

In the specific case of the geographical conditions per municipality and their influence on output levels, the evidence is also very interesting. One of our main findings is that the level of output in a municipality is positively correlated with its degree of urbanization. In this sense, urban centers tend to have a better endowment of basic services and higher outreach in terms of health and education than rural environments. Additionally, the urban activities usually related to the industrial and service sectors involve a level of productivity that is generally higher than activities carried out in the rural areas. This situation is even more dramatic if we consider that in the case of Bolivia, the rural economic activities imply agriculture or subsistence practices. Our data analysis also shows significant differences between urbanized municipalities. In this way, the presence of big urban centers in a municipality means higher output levels than in the case of municipalities with small urban centers.

Other geographical indicators such as elevation, temperature, precipitation, and type of ecological region were also included in the estimated regressions of growth level. However, in most of the regressions they could not be included at once, since given the geographical location of Bolivia they appeared to be closely correlated (See correlation matrix in Annex Table 3.7). Consistent with the results of Morales et al. (2000), our findings suggest that more elevation will influence negatively on output levels. The lowlands present higher levels of per capita GDP than the valleys and the highlands in Bolivia.

Estimations of economic growth in terms of output change

The importance of geographic characteristics was also highlighted when we regressed the output variation instead of its level. As we can see in Table 3.11, higher elevations have a negative effect on growth rates. Valleys and lowlands exhibit higher growth rates than highlands. Municipalities with urban centers grow at a superior rate than rural ones. In general, our results regarding geographical aspects at the municipality level are in line with recent international studies (Dell et al. 2008 and 2009) showing that geographical conditions are important in influencing not only the level of output but also output change.

With regard to the role of access to finance in terms of output variation, our results show that financial access exerts a positive effect on it. The estimators of our alternative financial access proxies were positive and statistically significant. Disaggregating the supply of financial services in formal and semiformal institutions, our findings imply that both types of financial institutions have a positive influence on growth rates in the country. Furthermore, regarding our indicators of access to financial services offered by MFIs, our results suggest that microfinance spurs not only output levels but also growth rates.

Regarding the growth regressions in terms of output change, we could also refer to the non-geographical control variables. Since economic convergence would follow a spatial pattern that cannot be captured by OLS estimation, we did not consider the initial level of output (income) as part of our estimated regressions. Additionally, the initial output level indicator appeared to be correlated with most of the control variables (See Annex Table 3.9). With regard to our human capital proxies, our results were consistent with the theory, indicating the crucial role of education as a growth factor. Other control variables such as fertility rate and ethnological fractionalization appear to be negatively correlated with growth rate, while a higher life expectancy seems to exert a positive effect on growth rates.

Table 3.10 A. Financial access and output level estimations

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10
Constant	5.861** (.00)	5.912** (.00)	5.713** (.00)	5.745** (.00)	5.531** (.00)	5.603** (.00)	5.946** (.00)	5.699** (.00)	4.782** (.00)	4.782** (.00)
Access	0.003** (.00)	0.002** (.00)	0.003** (.00)	0.002* (.01)	0.002** (.00)	0.002* (.02)				
Access-area							0.001* (.01)	0.001** (.00)		
Access-pop.									0.028* (0.04)	
Access-adult										0.013+ (.05)
Control variables										
Ferrate	-0.081** (.00)	-0.078** (.00)	-0.081** (.00)	-0.074** (.00)	-0.075** (.00)	-0.076** (.00)	-0.078** (.00)	-0.076** (.00)		
Education	1.412** (.00)	1.344** (.00)	1.356** (.00)	1.267** (.00)	1.447** (.00)	1.359** (.00)	1.332** (.00)	1.266** (.00)	1.623** (.00)	1.634** (.00)
Life expectancy	0.825** (.00)	0.840** (.00)	0.823** (.00)	0.800** (.00)	0.810** (.00)	0.852** (.00)	0.834** (.00)	0.846** (.00)	1.231** (.00)	1.226** (.00)
Etno	-0.003** (.00)	-0.003** (.00)	-0.003** (.00)	-0.003** (.00)	-0.003* (.02)	-0.003** (.00)	-0.003* (.01)	-0.003* (.01)	-0.002* (.04)	-0.002+ (0.05)
Urban	0.179** (.00)		0.189** (.00)							
Urban rate				0.004** (.00)						
Big urban		0.344** (.00)			0.331** (.00)	0.337** (.00)	0.345** (.00)	0.367** (.00)	0.433** (.00)	0.435** (.00)
Small urban		0.156** (.00)			0.154** (.00)	0.144** (.00)	0.152** (.00)	0.166** (.00)	0.141** (.00)	0.141** (.00)
Ln (elevation)	-0.023 (.10)	-0.031* (.04)					-0.034** (.00)			
Lowlands			0.100* (.02)	0.087+ (.05)				0.128** (.00)	0.069 (.10)	0.070 (.10)
Temperature					0.006* (.03)					
Precipitation						0.00008** (.00)				
R-squared	0.75	0.76	0.76	0.76	0.76	0.77	0.76	0.77	0.74	0.74
F	129.52 (.00)	129.27 (.00)	125.47 (.00)	141.24 (.00)	136.12 (.00)	127.09 (.00)	121.32 (.00)	123.42 (.00)	108.37 (.00)	107.51 (.00)
Number obs.	314	314	314	314	314	314	314	314	314	314

Note: Robust cross-sectional estimations. The dependent variable is the natural logarithm of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Access = Number of financial institution branches

Access-area = Number of financial institution branches per 1,000 square km

Access-pop = Number of financial institution branches per 10,000 people

Access-adult = Number of financial institution branches per 10,000 adults

Ferrate = Fertility rate

Education = Average education index (The average of literacy, years of school, and education enrollment sub-indexes)

Life expectancy = Index that standardized years of life expectancy between 0 and 1

Etno = Percentage of the total population that is part of an indigenous ethnic group

Urban = Dummy variable (1= If the municipality has an urban center and 0 = if the municipality is totally rural)

Urban rate = Urbanization percentage

Big urban = Dummy variable (1 = If the municipality has a big or medium urban center and 0 = if it is totally rural)

Small urban = Dummy variable (1 = If the municipality has a small urban center and 0 = if it is totally rural)

Ln (elevation) = Natural logarithm of the minimum elevation in meters above the level of the sea

Lowlands = Dummy variable for ecological region (1 = Lowland, 0 = Highland)

Temperature = Average temperature

Precipitation = Average precipitation

Source: Author's own preparation on basis of original estimations

Table 3.10 B. Financial access and output level estimations using disaggregated financial access indicators

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9
Constant	5.693** (0.00)	5.698** (0.00)	4.787** (0.00)	5.696** (0.00)	5.700** (0.00)	4.767** (0.00)	5.69** (0.00)	5.700** (0.00)	4.769** (0.00)
Formal	0.002* (0.03)								
Formal-area		0.002** (0.00)							
Formal-adult			0.016+ (0.07)						
Semiformal				0.009+ (0.05)					
Semiformal-area					0.004** (0.00)				
Semiformal-adult						0.014 (0.40)			
Microfinance							0.006+ (0.06)		
Microfinance-area								0.003* (0.02)	
Microfinance-adult									0.015 (0.20)
Control variables									
Ferrate	-0.076** (.00)	-0.076** (.00)		-0.076** (.00)	-0.076** (.00)		-0.077** (.00)	-0.076** (.00)	
Education	1.280** (.00)	1.267** (.00)	1.623** (.00)	1.273** (.00)	1.268** (.00)	1.645** (.00)	1.275** (.00)	1.268** (.00)	1.644** (.00)
Life expectancy	0.848** (.00)	0.846** (.00)	1.236** (.00)	0.846** (.00)	0.847** (.00)	1.242** (.00)	0.847** (.00)	0.845** (.00)	1.237** (.00)
Etno	-0.003* (.01)	-0.003* (.01)	-0.002+ (.05)	-0.003* (.01)	-0.003* (.01)	-0.002+ (.05)	-0.003* (.01)	-0.003* (.01)	-0.002+ (.05)
Big urban	0.373** (.00)	0.363** (.00)	0.433** (.00)	0.361** (.00)	0.379** (.00)	0.454** (.00)	0.360** (.00)	0.378** (.00)	0.449** (.00)
Small urban	0.169** (.00)	0.167** (.00)	0.141** (.00)	0.168** (.00)	0.167** (.00)	0.156** (.00)	0.167** (.00)	0.165** (.00)	0.151** (.00)
Lowlands	0.121** (.00)	0.127** (.00)	0.066 (.10)	0.127** (.00)	0.130** (.00)	0.071 (.10)	0.127** (.00)	0.130** (.00)	0.074 (.10)
R-squared	.77	.77	.74	.76	.77	.74	.77	.77	.74
F	119.53	125.70	108.02	119.00	123.21	103.7	117.92	116.38	104.44
Prob > F	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
Number observations	314	314	314	314	314	314	314	314	314

Note: Robust cross-sectional estimations. The dependent variable is the natural logarithm of real per capita GDP. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Formal = Number of formal financial institution branches

Formal-area = Number of formal financial institution branches per 1,000 square km

Formal-adult = Number of formal financial institution branches per 10,000 adults

Semiformal = Number of semiformal financial institution branches

Semiformal-area = Number of semiformal financial institution branches per 1,000 square km

Semiformal-adult = Number of semiformal financial institution branches per 10,000 adults

Microfinance = Number of microfinance institution branches

Microfinance-area = Number of microfinance institution branches per 1,000 square km

Microfinance-adult = Number of microfinance institution branches per 10,000 adults

Ferrate = Fertility rate

Education = Average education index (The average of literacy, years of school, and education enrollment sub-indexes)

Life expectancy = Index that standardized years of life expectancy between 0 and 1

Etno = Percentage of the total population that is part of an indigenous ethnic group

Big urban = Dummy variable (1 = If the municipality has a big or medium urban center and 0 = if it is totally rural)

Small urban = Dummy variable (1 = If the municipality has a small urban center and 0 = if it is totally rural)

Lowlands = Dummy variable for ecological region (1 = Lowland, 0 = Highland)

Source: Author's own preparation on basis of original estimations

Table 3.11. Financial access and output change estimations

Variable	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10	Regr. 11
Constant	0.032** (.00)	0.063** (.00)	0.028** (.00)	0.028** (.00)	0.013** (.00)	0.033** (.00)	0.063** (.00)	0.033** (.00)	0.014** (.00)	0.033** (.00)	0.014** (.00)
Access-area	0.00004* (.04)										
Access-adult		0.0006** (.00)	0.0005+ (.08)	0.0005+ (.09)	0.0006+ (.05)						
Formal-area						0.00004+ (.06)					
Formal-adult							0.0009* (.01)				
Semiformal-area								0.0002* (.03)			
Semiformal-adult									0.0010 (.10)		
Microfinance-area										0.0001* (.02)	
Microfinance-adult											0.0009+ (.07)
Control Variables											
Ln (ferrate)		-0.013** (.00)								-0.013** (0.00)	
Ln (Education)	0.024** (.00)	0.023* (0.02)	0.034** (0.00)	0.033** (0.00)	0.037** (0.00)	0.024** (0.00)	0.022** (0.00)	0.024** (0.00)	0.038** (0.00)	0.024** (0.00)	0.038** (0.00)
Ln(Life expectancy)	0.025** (.00)	0.02** (0.00)				0.025** (0.00)	0.020** (0.00)	0.025** (0.00)		0.025** (0.00)	
Ln (Ethno)	-0.001* (.05)		-0.002** (0.00)	-0.002** (0.00)		-0.001+ (0.05)		-0.001+ (0.05)		-0.001** (0.00)	
Urban	0.007** (.00)		0.007** (0.00)		0.007** (0.00)	0.007** (0.00)		0.007** (0.00)	0.007** (0.00)	0.007** (0.00)	0.007** (0.00)
Big urban				0.009** (0.00)							
Small urban				0.006** (0.00)							
Ln (elevation)	-0.0007 (.10)	-0.003** (0.00)	-0.0009+ (0.07)	-0.001* (0.04)		-0.0007 (0.10)	-0.003** (0.00)	-0.0007** (0.00)		-0.0008 (0.10)	
Valley					0.004** (0.00)				0.004 (0.10)		0.004** (0.00)
Lowlands					0.002** (0.00)				0.006** (0.00)		0.006** (0.00)
R-squared	.54	.52	.48	.48	.48	.53	.52	.54	.48	.54	.48
F	78.80	87.65	74.21	59.94	73.76	78.71	86.00	79.29	74.40	79.76	74.76
Prob > F	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
Number observations	314	314	314	314	314	314	314	314	314	314	314

Note: Robust cross-sectional estimations. The dependent variable is the variation of income between 2005 and 2001. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Access-area = Number of financial institution branches per 1,000 square km

Access-adult = Number of financial institution branches per 10,000 adults

Formal-area = Number of formal financial institution branches per 1,000 square km

Formal-adult = Number of formal financial institution branches per 10,000 adults

Semiformal-area = Number of semiformal financial institution branches per 1,000 square km

Semiformal-adult = Number of semiformal financial institution branches per 10,000 adults

Microfinance-area = Number of microfinance institution branches per 1,000 square km

Microfinance-adult = Number of microfinance institution branches per 10,000 adults

Ln (Ferrate) = Natural Logarithm of Fertility rate

Ln (Education) = Natural logarithm of average education index

Ln (Life expectancy) = Natural logarithm of an index that standardized years life expectancy between 0 and 1

Ln (Ethno) = Natural logarithm of the percentage of the total population that is part of an indigenous ethnic group

Urban = Dummy variable (1 = If the municipality has a urban center and 0 = if the municipality is totally rural)

Big urban = Dummy variable (1 = If the municipality has a big or medium urban center and 0 = if it is totally rural)

Small urban = Dummy variable (1 = If the municipality has a small urban center and 0 = if it is totally rural)

Ln (elevation) = Natural logarithm of the minimum elevation in meters above the level of the sea

Valley = Dummy variable for ecological region (1 = Valley, 0 = Highland)

Lowlands = Dummy variable for ecological region (1 = Lowland, 0 = Highland)

Source: Author's own preparation on basis of original estimations

3.6.2 Access to finance and poverty

Our econometric results regarding the relationship between financial access and poverty are summarized in Tables 3.12 A and B. As in the case of growth, in addition to measuring the effect of access to financial services offered by all type of financial institutions, we have also established some evidence about the effect of financial services supplied by formal, semiformal, and microfinance institutions on poverty.

As we have seen in Sections 3 and 4, after the crisis of 1985 and the new scenario of financial liberalization, new financial institutions emerged in the Bolivian financial system in the form of non-bank institutions (formal and semiformal), and some of them particularly as MFIs. The emergence and consolidation of these new financial institutions has meant a broader outreach of the financial system in terms of number of branches, number of customers, and size of the loan portfolio. The interesting point is that most such institutions reached “low-income” people who were not reached before 1989 by the financial institutions. Therefore, we could expect that these non-traditional financial institutions have exercised an important role in diminishing poverty in Bolivia.

Two different available indicators of poverty were used. They are the percentage of poor population calculated by the unsatisfied basic needs method and the percentage of poor population calculated by the high poverty line method. Also, as in the economic growth regressions we have also included in all the poverty estimations a set of control variables. This helps to prevent misspecification of the model, since poverty is related not only to access to finance, but also to other variables such as education, fertility rate, urbanization, and altitude. However, not all control variables are included at once in order to avoid multicollinearity problems and give higher robustness to our estimations. For all the estimated regressions, the value of the estimators and their respective t-statistic probabilities are reported in Tables 3.12 A and B, along with the value and probability of F and the R-squares.

The role of access to finance

Regarding the effect of financial access on poverty, our results revealed robust evidence about access to finance as a poverty reduction factor. Also, as we can see in Table 3.12 B, there is evidence, reflected in the statistically significant coefficients of formal and semiformal financial access indicators, that both formal and semiformal financial institutions matter for poverty alleviation. Therefore, in terms of economic policies to reduce poverty, it is necessary to improve access to the financial services supplied by both types of financial institutions.

Additionally, considering the role of MFIs in poverty reduction, our results have met our expectations. The highly statistically significant coefficients for our access to microfinance services indicators (Microfinance and Microfinance-area in Table 3.12 B) suggest that microfinance in Bolivia is not only pro-growth but also pro-poor. Nevertheless, as noted by Honohan (2004b), microfinance services do not necessarily reach the lowest income groups. Often MFIs have as clientele the near poor or even micro and small firms that are not necessarily owned by the truly poor.

In this last respect, the effect of microfinance on poverty reduction could have some limitations, and more if we consider that MFIs (except NGOs) in Bolivia seem to serve “urban poor” better than “rural poor.” The case of semiformal MFIs, mainly NGOs, is different if we consider that they have more presence in rural areas. However, it is evident that further studies are necessary in order to determine the possible limitations of microfinance in poverty alleviation in Bolivia.

Table 3.12 A. Financial access and poverty estimations

Explanatory Variables	Ln (poverty1)								Ln (poverty2)			
	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10	Regr. 11	Regr. 12
Constant	3.465** (.00)	0.724** (.00)	3.857** (.00)	4.419** (.00)	3.581** (.00)	3.842** (.00)	4.445** (.00)	6.041** (.00)	3.701** (.00)	3.996** (.00)	3.692** (.00)	4.001** (.00)
Access	-0.006** (.00)	-0.006** (.00)	-0.003+ (.07)	-0.003+ (.05)					-0.002* (.01)	-0.002* (.04)		
Access adult					-0.014+ (.09)	-0.014+ (.06)	-0.013+ (.09)	-0.011+ (.06)				
Access area											-0.001** (.00)	-0.001** (.00)
Control Variables												
Ln (ferrate)	0.445** (.00)	0.450** (.00)	0.384** (.00)	0.068* (.00)	0.530** (.00)	0.394** (.00)	0.068** (.00)	0.217** (.00)	0.160* (.02)	0.169** (.00)	0.161** (.00)	0.168** (.00)
Ln (Education)	-0.113+ (.05)	-0.232** (.00)	-0.182** (.00)	-0.267* (.00)	-0.254** (.00)	-0.185** (.00)	-0.302** (.00)		-0.261** (.00)	-0.234** (.00)	-0.256** (.00)	-0.230** (.00)
Ln (etno)	0.023+ (.07)								0.031* (.02)	0.026* (.03)	0.030* (.02)	0.026* (.03)
Urban	-0.199** (.00)	-0.178** (.00)			-0.177** (.00)							
Big Urban			-0.459** (.00)	-0.457** (.00)		-0.517** (.00)	-0.517** (.00)	-0.381** (.00)	-0.088** (.00)	-0.093* (.01)	-0.092** (.00)	-0.094* (.01)
Small Urban			-0.144** (.00)	-0.126** (.00)		-0.125** (.00)	-0.107** (.00)	-0.068** (.00)	0.035* (.03)	0.041** (.00)	0.038* (.02)	0.044** (.00)
Ln (elevation)	0.215** (0.00)								0.030** (.00)		0.032** (.00)	
Valley		-0.152** (.00)	-0.139** (.00)		-0.157** (.00)	-0.138** (.00)		-0.125** (.00)				
Lowlands		-0.141** (0.00)	-0.146** (.00)		-0.151** (.00)	-0.151** (.00)		-0.064+ (.05)		-0.067** (.00)		-0.071** (.00)
Temperature				-0.009** (.00)			-0.009** (.00)					
Precipitation										-0.00005** (.00)		-0.00005** (.00)
Ln (GDP per capita)								-0.283** (.00)				
R-squared	.60	.63	.69	.68	.57	.67	.66	.72	.54	.58	.55	.59
F	38.48	42.74	42.57	42.99	31.71	44.57	40.77	52.26	43.03	38.95	53.91	48.07
Prob > F	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
Number obs.	314	314	314	314	314	314	314	314	314	314	314	314

Note: Robust cross-sectional estimations. From regression 1 to 8 the dependent variable is the percentage of poor population calculated by the unsatisfied basic needs method, and from regression 9 to 12 the dependent variable is the percentage of poor population calculated by the high poverty line method. In regressions 4 and 7 the variables fertility rate and education are included in absolute terms and not in their natural logarithm form. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Ln (poverty1) = Natural logarithm of percentage of poor population calculated by the unsatisfied basic needs method (2001)

Ln (poverty 2) = Natural logarithm of percentage of poor population calculated by the high poverty line method (2001)

Access = Number of financial institution branches

Access-area = Number of financial institution branches per 1,000 square km

Access-adult = Number of financial institution branches per 10,000 adults

Ln (Ferrate) = Natural logarithm of fertility rate

Ln (Education) = Natural logarithm of an average composite education index (The average of literacy, years of school, and education enrollment sub-indexes)

Ln (Etno) = Natural logarithm of percentage of the total population that is part of an indigenous ethnic group

Urban = Dummy variable (1= If the municipality has a urban center and 0 = if the municipality is totally rural)

Big urban = Dummy variable (1 = If the municipality has a big or medium urban center and 0 = if it is totally rural)

Small urban = Dummy variable (1 = If the municipality has a small urban center and 0 = if it is totally rural)

Ln (elevation) = Natural logarithm of the minimum elevation in meters above the level of the sea

Valley = Dummy variable for ecological region (1 = Valley, 0= Highland)

Lowlands = Dummy variable for ecological region (1 = Lowland, 0= Highland)

Temperature = Average temperature

Precipitation = Average precipitation

Ln (GDP per capita) = Natural logarithm of per capita GDP

Source: Author's own preparation on basis of original estimations

Table 3.12 B. Financial access and poverty estimations using disaggregated financial access indicators

Explanatory Variables	Ln (poverty1)						Ln (poverty2)					
	Regr. 1	Regr. 2	Regr. 3	Regr. 4	Regr. 5	Regr. 6	Regr. 7	Regr. 8	Regr. 9	Regr. 10	Regr. 11	Regr. 12
Constant	3.714** (.00)	3.771** (.00)	3.706** (.00)	3.298** (.00)	3.722** (.00)	3.300** (.00)	3.708** (.00)	3.698** (.00)	3.694** (.00)	3.679** (.00)	3.696** (.00)	3.678** (.00)
Formal	-0.007** (.00)						-0.002** (.00)					
Formal area		-0.004 (0.30)						-0.002** (.00)				
Semiformal			-0.024* (.01)						-0.008* (.04)			
Semiformal area				-0.006+ (.08)						-0.003+ (.05)		
Microfinance					-0.018** (.00)						-0.006+ (.05)	
Microfinance area						-0.005* (.01)						-0.002 (.10)
Control Variables												
Ln (ferrate)	0.454** (.00)	0.478** (.00)	0.464** (.00)	0.514** (.00)	0.455** (.00)	0.511** (.00)	0.161** (.00)	0.159** (.00)	0.163** (.00)	0.167** (.00)	0.162** (.00)	0.167** (.00)
Ln (Education)	-0.236** (.00)	-0.108+ (.07)	-0.224** (.00)	-0.111+ (.07)	-0.226** (.00)	-0.110+ (.07)	-0.261** (.00)	-0.256** (.00)	-0.258** (.00)	-0.255** (.00)	-0.259** (.00)	-0.255** (.00)
Valley	-0.153** (.00)		-0.150** (.00)		-0.153** (.00)							
Lowlands	-0.138** (.00)		-0.154** (.00)		-0.155** (.00)							
Urban	-0.180** (.00)	-0.200** (.00)	-0.177** (.00)	-0.205** (.00)	-0.172** (.00)	-0.203** (.00)						
Big Urban							-0.093* (.01)	-0.088* (.01)	-0.083* (.03)	-0.103+ (.05)	-0.081* (.03)	-0.103** (.00)
Small Urban							0.034* (.03)	0.038* (.01)	0.037* (.02)	0.039* (.02)	0.038* (.02)	0.039* (.02)
Ln (elevation)		0.027* (.02)		0.029* (.02)		0.029* (.02)	0.029** (.00)	0.032** (.00)	0.032** (.00)	0.033** (.00)	0.032** (.00)	0.034** (.00)
Ln (etno)		0.021 (.10)		0.019 (.10)		0.019 (.10)	0.031* (.02)	0.031* (.02)	0.030* (.02)	0.030* (.03)	0.031* (.03)	0.030** (.00)
R-squared	.63	.58	.61	.55	.62	.56	.53	.54	.54	.54	.53	.54
F	39.92 (.00)	32.85 (.00)	34.47 (.00)	30.28 (.00)	36.65 (.00)	30.88 (.00)	42.16 (.00)	70.58 (.00)	43.96 (.00)	42.12 (.00)	43.96 (.00)	42.04 (.00)
Number obs.	314	314	314	314	314	314	314	314	314	314	314	314

Note: Robust cross-sectional estimations. From regression 1 to 6 the dependent variable is the percentage of poor population calculated by the unsatisfied basic needs method, and from regression 7 to 12 the dependent variable is the percentage of poor population calculated by the high poverty line method. Probabilities of t-statistics are reported between brackets below every estimated regression coefficient. **, *, and + denote significance at a 1%, 5%, and 10% level, respectively.

Ln (poverty1) = Natural logarithm of percentage of poor population calculated by the unsatisfied basic needs method (2001)

Ln (poverty 2) = Natural logarithm of percentage of poor population calculated by the high poverty line method (2001)

Formal = Number of formal financial institution branches

Formal-area = Number of formal financial institution branches per 1,000 square km

Semiformal = Number of semiformal financial institution branches

Semiformal-area = Number of semiformal financial institution branches per 1,000 square km

Microfinance = Number of microfinance institution branches

Microfinance-area = Number of microfinance institution branches per 1,000 square km

Ln (Ferrate) = Natural logarithm of fertility rate

Ln (Education) = Natural logarithm of an average composite education index (The average of literacy, years of school, and education enrollment sub-indexes)

Valley = Dummy variable for ecological region (1 = Valley, 0= Highland)

Lowlands = Dummy variable for ecological region (1 = Lowland, 0= Highland)

Urban = Dummy variable (1= If the municipality has a urban center and 0 = if the municipality is totally rural)

Big urban = Dummy variable (1 = If the municipality has a big or medium urban center and 0 = if it is totally rural)

Small urban = Dummy variable (1 = If the municipality has a small urban center and 0 = if it is totally rural)

Ln (elevation) = Natural logarithm of the minimum elevation in meters above the level of the sea

Ln (etno) = Natural logarithm of percentage of the total population that is part of an indigenous ethnic group

Source: Author's own preparation on basis of original estimations

The role of other factors

In addition to financial access as a factor of poverty reduction, we have also considered other variables that could affect poverty. In this respect, our findings suggest that higher fertility rates and ethnological fractionalization in Bolivia lead to more poverty. On the contrary, a higher education level contributes to poverty alleviation. Additionally, the data analysis shows that poverty is more severe in rural than in urban municipalities. Among urbanized municipalities poverty is higher in municipalities where there are small urban centers than in municipalities where big urban centers are established.

Considering other geographical variables besides urbanization, our findings are consistent with other previous studies about the effects of geography on poverty⁶², showing that geography matters when explaining poverty. Higher altitude appears to be negatively correlated with our two measures of poverty. Poverty in municipalities characterized as lowlands or valleys seems lower than in those highland municipalities.

Additionally, in order to test the hypothesis that suggests that economic growth is pro-poor, we have also included an indicator of growth in the set of control variables. In this respect, as we can see in Table 3.12 A (Regression 8)⁶³, the estimated parameter of our growth indicator is negative. Hence, it is evident that the reduction of poverty in Bolivia is not possible without economic growth.

To summarize this section, our empirical analysis has shown the importance of access to finance for economic growth and poverty reduction. Therefore, an important task for policymakers and academics is not only the formulation of policies that lead to a more efficient (deeper)⁶⁴ financial system, but also to a more inclusive financial system.

3.7 Conclusions

With the beginning of the application of New Economic Policy in August of 1985, a program of stabilization and structural reforms in Bolivia was implemented. In terms of the financial system, this economic policy changed the scenario from one of financial repression to one of financial liberalization. The stabilization package already included some financial reforms, mainly in terms of liberalization of interest rates. However, it was not until 1987 (once that stabilization was reached) that structural financial reforms came. These reforms, which mainly related to the regulatory and supervision framework, played an important role in improving the efficiency, solvency, and access of the financial system in the stage of financial liberalization.

After the crisis of 1985 and the new scenario of financial liberalization, new financial institutions emerged in the Bolivian financial system in the form of non-bank institutions (formal and semiformal), and some of them particularly as MFIs. The emergence and consolidation of these new financial institutions gave rise to broader outreach of the financial system in terms of number of branches, number of customers, size of the loan portfolio, and also a broader diversification in terms of financial institutions. The interesting point is that most of these MFIs reached an important “low-income” group that did not have access to financial services before 1989.

Bolivia is a unique and fascinating case of microfinance advancing far within a short time. Also, its rapid growth has been accompanied by the development of the ability and willingness of microfinance institutions to serve the poor on a commercial basis. The commercialization of microfinance has

⁶² We are referring to the studies of Morales et al. (2000) and Vargas (2004).

⁶³ The indicator of economic growth is not included in the other estimated regression since it is highly correlated with other control variables (i.e. education, fertility rate).

⁶⁴ This is derived from the conclusions of our previous chapter about the effect of financial development on growth and inequality in the case of Latin America and the Caribbean.

advanced to such a point in Bolivia that this sector is no longer primarily donor-driven. In the microfinance sector we have to distinguish between the formal and the semiformal institutions. The greater weight of the portfolio and almost all of the deposits of the microfinance sector are in the formal MFIs. The functions of the semiformal MFI entities are usually limited to fund credits; however, they reach at least 50% of all microfinance sector customers. Additionally, these semiformal financial institutions play an important role in access to finance in rural areas and in reaching the poorest agents that participate in the credit market.

The Bolivian experience in terms of the evolution of its financial system from financial repression to financial liberalization suggests that the role of government in building an effective and inclusive financial system should focus on regulation, not on ownership. In this respect, there are both theoretical and empirical arguments showing that the state is neither efficient nor effective when it comes to credit allocation.

Recently, closed credit unions and NGOs have been incorporated into the regulatory and supervisory framework. Cull et al. (2009) refer to some trade-offs derived from this transformation. Specifically, an important trade-off relates to regulation and supervision. There is no doubt that rigorous and regular supervision is critical for deposit-taking institutions, but this is costly since this regulatory supervision pushes institutions to serve better customers (less poor agents) with larger loans in order to maintain profitability. Additionally, supervision appears to be related to a higher concentration of staff in the head office, reducing the number of staff that used to work in the branches. Therefore, could NGOs and other socially minded institutions in Bolivia survive regulation without redefining their commitment to the poorest?

Despite the fact that the Bolivian financial system has advanced since the end of the 1980s in terms of increased access to finance, there are still important limitations. One of these limitations relates to the low supply of financial services in rural areas. In fact, in terms of physical access, more than 60% of financial institution branches are concentrated in urban areas. The presence of financial intermediaries by areas seems correlated with the population concentration in the urban areas, which represent around 63% of the total. In addition, only around 45% of the municipalities in Bolivia have financial institution branches physically present. The rest do not have a supply of financial services, not even those services offered by semiformal institutions such as NGOs. So it is highly probable that in those municipalities the figure of pure informal credit sources (lenders, rotating credit, family, and relatives) would be the only option in terms of supply of financial services.

Financial development has proven to be an important factor promoting growth and social fairness. However, we have to consider that financial development does not necessarily mean that finance is available for all on an equal basis. Therefore, it is important to consider the dimension of access. In this respect, theoretical models relating to the effect of finance on development outcomes focus on the issue of access of finance. However, in empirical terms this dimension has been overlooked, mostly because of serious data gaps. The collection and systematization of data across countries is a task that's only recently started, and as such it still has significant limitations in terms of measuring..

Our econometric analysis highlight the importance of access to finance as a factor spurring growth – both in terms of the output level and output change – and reducing poverty in Bolivia. Therefore, it is possible that policies that ensure a well-functioning and inclusive financial system do not only contribute to economic growth, but also could reduce poverty. Therefore, emphasis on the financial sector seems to be a crucial component of pro-poor development in the case of Bolivia.

Additionally, our contextual and econometric analyses suggest that policies to improve financial access should not only focus on formal financial institutions but also on semiformal intermediaries such as NGOs and closed credit unions. The importance of microfinance as a pro-growth and pro-poor factor is also suggested in the case of Bolivia, although we should be cautious with this respect given

some restrictions of our econometric study. Additionally, we have to be aware of the likely limitations of microfinance achieving poverty reduction.

Our study also reveals that a big challenge in terms of access to finance is rural areas, where the supply of financial services is more limited than in urban areas. In this respect, it seems that some of the modifications on the regulatory normative framework could have a positive impact in terms of access (i.e. the criteria of moving branches). However, other measures such as the inclusion under national regulatory supervision of the semiformal institutions (NGOs and closed credit unions) that have a strong presence in the rural areas could have a negative impact on access to finance in general and particularly in rural areas, since this supervision could push institutions to serve better customers (less poor agents) with larger loans in order to maintain sustainability. Therefore, it is necessary to look for new alternatives in order to improve access to finance in rural areas.

References

- Abdurohman (2003). The role of financial development in promoting economic: Empirical evidence of Indonesian economy. *Jurnal Keuangan dan Moneter*, 6(2).
- Abu-Bader, S. & Abu-Qarn, A. (2005). *Financial development and economic growth: Time series evidence from Egypt*. Discussion Paper No. 05-14, Monaster Center for Economic Research.
- Adamu, P. & Kargbo, S. (2011). Financial development and economic growth in Sierra Leone. *Journal of Monetary and Economic Integration*, 9(2), 30-61.
- Adamopoulos, A. (2009). Financial development and economic growth: An empirical analysis for Ireland. *International Journal of Economic Sciences and Applied Research* 3 (1), 75-88.
- Ahmed, S. & Ansari, M. (1995). Financial development in Bangladesh -- A test of the McKinnon-Shaw Model. *Canadian Journal of Development Studies*, 16(-:2), 291-302.
- Afcha, G.; Larrazabal, E. & Cuevas, J. (1992). Desintermediación y liberalización financiera en Bolivia, Análisis Económico, UDAPE, Bolivia.
- Akinboade, OI. (2000). The relationship between financial deepening and economic growth in Tanzania. *Journal of International Development*, 12, 939-950.
- Aliero, H. & Ibrahim, S. (2012). Does access to finance reduce poverty? Evidence from Katsina State. *Mediterranean Journal of Social Sciences*, 3(2), 575-583.
- Al-Malkawi, H., Marashdeh, H., & Abdullah, N. (2012). Financial development and economic growth in the UAE: Empirical assessment using ARDL approach to co-integration. *International Journal of Economics and Finance*, 4(5), 105-115.
- Andersen, T. & Tarp, F. (2003). Financial liberalization, financial development and economic growth in LDCs. *Journal of International Development*, 15(15,) 1041-51.
- Ang, J. (2007). What are the mechanisms linking financial development and economic growth in Malaysia? *Economic Modeling*, 25(1), 38-53.
- Ang, J. (2008). *Finance and inequality: The case of India*. The Australian National University, CAMA Working Paper Series 18/2008.
- Antelo, E. (2000). Políticas de estabilización y de reformas estructurales en Bolivia a partir de 1985. Serie Reformas Económicas Nº 62, CEPAL, Santiago.
- Al, Y. & Yousif, K. (2002). Financial development and economic growth: Another look at the evidence from developing countries. *Journal of International Development*, 15(2), 189-209.
- Arestis, P. & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *Economic Journal*, 107, 783-799.
- Arriola, P. (2005). *Las microfinanzas en Bolivia: Historia y situación actual*. La Paz, Bolivia.
- Aslam, M., Awam, M., Shaheen, S. & Waqas, M. (2011). Financial development, international trade and economic growth: Empirical evidence from Pakistan. *Romanian Journal of Fiscal Policy*, 2:2, July-December 2011, 11-19.
- Asteriou, D. & Simon, P. (2000). Financial development and economic growth: Time series evidence for the case of the UK. *Economia*, 4:2, 122-41.

- ASFI, Autoridad de Supervisión del Sistema Financiero (2010a). *Entidades supervisadas con licencia de funcionamiento*. La Paz, Bolivia.
- ASFI, Autoridad de Supervisión del Sistema Financiero (2010b). *Entidades en proceso de adecuación*. La Paz, Bolivia.
- Aziz, J. & Christoph, D. (2002). *Growth-financial intermediation nexus in China*. IMF Working Paper No. 02/194.
- Banco Central de Bolivia (1985-2008). *Boletines Estadísticos* (Monthly publications). BCB, La Paz- Bolivia.
- Banco Central de Bolivia (1995-2008). *Memorias anuales 1995-2008*. BCB, La Paz- Bolivia.
- Banerjee, A., Duflo, E., Glennerster, R. & Kinnan, C. (2009). *The miracle of microfinance? Evidence from a randomized evaluation*. Contribution Financial Access Initiative (FAI) - Innovations for Poverty Action (IPA).
- Barajas, A.; Chami, R. & Reza, Y. (2012). The finance and growth nexus re-examined: Do all countries benefit equally? IMF, Preliminary draft.
- Barro, R. (1997). *Determinants of economic growth: A cross country empirical study*. The MIT Press, The Lionel Robinson Lectures.
- Barth, J.R., Caprio, G., & Levine, R. (2001). Banking systems around the globe: Do regulation and ownership affect performance and stability? in Mishkin, F. (Ed.), *Prudential Regulation and Supervision: What Works and What Doesn't* (pp. 31-95). University of Chicago Press: Chicago.
- Bhattacharya, P. & Sivasubramanian, M. (2003). Financial development and economic growth in India: 1970–1971 to 1998–1999. *Applied Financial Economics*, 13, 925-929.
- Bateman, M. (2011). *Microfinance as a development and poverty reduction policy: is it everything it's cracked up to be?* Background Note. Overseas Development Institute(ODI). United Kingdom.
- Beck, T., Demirgüç-Kunt, A., Levine, R., & Maksimovic, V. (2000). *Financial structure and economic development: Firm, industry, and country*. World Bank Policy Research Working Paper Series No. 2423.
- Beck, T., Demirgüç-Kunt, A. & Levine, R. et al. (2004a). *Finance, inequality, and poverty: Cross-country evidence*. NBER Working Paper No. 10979.
- Beck, T., Demirgüç-Kunt, A., Laeven, L. & Levine, R. (2004b). *Finance, firm size, and growth*. NBER Working Papers 10983.
- Beck, T., Demirgüç-Kunt, A. & Levine, R. (2005). SMEs, growth, and poverty: Cross-country evidence. *Journal of Economic Growth*, 10:3, pp. 199-229.
- Beck, T., Demirgüç-Kunt, A. & Martinez, S. (2006). *Banking services for everyone? Barriers to bank access and use around the world*, World Bank Policy Research Working Paper 4079.
- Beck, T., Demirgüç-Kunt, A., Levine, R. (2007a). Finance, inequality and the poor. *Journal of Economic Growth*, 12:1, 27-49.
- Beck, T., Demirgüç-Kunt, A. and Martinez, S. (2007b). Reaching out: Access to and use of banking services across countries, *Journal of Financial Economics*, 85, 234-66.
- Beck, T. & De la Torre, A. (2007c). The basic analytics of access to financial services, financial markets, institutions and instruments, 16, 79-117.
- Beck, T., Demirgüç-Kunt, A. and Honohan, P. (2008a). *Access to financial services: Measurement, impact and policies*. (Draft May 2008).
- Beck, T. & Demirgüç-Kunt, A. (2008b). *Access to finance – an unfinished agenda*. World Bank Economic Review, 22:3, 383-396.
- Beck, T., Demirgüç-Kunt, A. and Honohan, P. (2008c). *Finance for all? Policies and pitfalls in expanding access*. A World Bank Policy Research Report, Washington, D.C.
- Beck, T. (2009). Policy choices for an efficient and inclusive financial system in: *Collateral reform and access to credit*. Edited by F. Dahan and J. Simpson, Edward Elgar Ltd.
- Bida Ndako, U. (2010). Stock markets, banks and economic growth: A time-series evidence from South Africa. Department of Economics, University of Leicester, UK.
- Bittencourt, M. (2006). Financial development and inequality: Brazil 1985-99. *Bristol Economics Discussion Papers No. 06/582*.
- Boyreau, G. (2003). *Financial intermediation and growth: Chinese style*, World Bank, Policy Research Working Paper Series No. 3027.

- Bruhn, M. & Love, I. (2009). The economic impact of banking the unbanked: Evidence from Mexico. World Bank Policy Research Working Paper 4981, World Bank, Washington, D.C.
- Chandra Shil, N. (2009). Micro finance for poverty alleviation: A commercialized view. *International Journal of Economics and Finance*, 1(:2), 191-205.
- Chang, T. (2002). Financial development and economic growth in mainland China: A note on testing demand-following or supply-leading hypothesis. *Applied Economics Letters*, 9(13), 869-73.
- Chang, T. & Caudill, S. (2005). Financial development and economic growth: The Case of Taiwan. *Applied Economics*, 37(12), 1329-35.
- Chakraborty, I. (2010). Financial development and economic growth in India: An analysis of the post-reform period. *South Asia Economic Journal*, 11(2), 287-308.
- Choe, C. & Moosa, I. (1999). *Financial system and economic growth: The Korean experience*. World Development, 27(6), 1069-1082.
- Carkovic, M. & Levine, R. (2002). *Finance and growth: New evidence and policy analyses for Chile*. Working paper No. 157, Central Bank of Chile.
- Casanovas, R. & Maclean, J. (1995). *Acceso de la pequeña y microempresa al sistema financiero en Bolivia: situación actual y perspectivas*. Serie Financiamiento del Desarrollo – CEPAL, Santiago.
- CGAP (Consultative Group to Assist the Poor) & World Bank (2009). *Financial access 2009: Measuring access to financial services around the world*. Washington, D.C., USA.
- CGAP (Consultative Group to Assist the Poor) & World Bank (2010). *Financial access 2010: The state of financial inclusion through the crisis*. Washington, D.C.
- Clarke, G. et al. (2003). *Finance and income inequality: test of alternative theories*. Policy Research Working Paper No. 2984, World Bank.
- Clarke, G. et al. (2006) Finance and income inequality: what do the data tell us? *Southern Economic Journal*, 72(3), 578–596
- Claessens, S. (2005). *Access to financial services: A review of the issues and public policy objectives*. World Bank Policy Research Working Paper 3589.
- Cull, R., Demirgüç-Kunt, A. & Morduch, J. (2008). *Microfinance meets the market*. Financial Access Initiative (FAI) contribution, New York, USA.
- Cull, R., Demirgüç-Kunt, A. & Morduch, J. (2009a). *Microfinance tradeoffs: Regulation, competition and financing*. Policy Research Working Paper 5086, World Bank, Washington, D.C.
- Cull, R., Demirgüç-Kunt, A. & Morduch, J. (2009b). *Banks and microbanks*. Financial Access Initiative (FAI) contribution, New York.
- Cull, R. & Scott, K. (2010). Measuring household usage of financial services: Does it matter how or whom you ask? *The World Bank Economic Review*, 24(2), 199–233.
- Culpepper, P. (2005). Single country studies and comparative politics. *Italian Politics & Society*, 60, 2-5
- De La Torre, A., Gozzi, J. C. & Schmukler, S. (2007). *Innovative experiences in access to finance: Market friendly roles for the visible hand?* Policy Research Working Paper 4326, The World Bank, Latin America and the Caribbean Region.
- Dell, M., Jones, B. & Olken, B. (2008). Climate shocks and economic growth: Evidence from the last half century. MIT, Northwestern University and NBER.
- Dell, M. & Acemoglu, (2009) *Productivity differences between and within countries*. Department of Economics. Massachusetts Institute of Technology.
- Dell, M., Jones, B. & Olken, B. (2009). Temperature and income: Reconciling new cross-sectional and panel estimates. *American Economic Review Papers and Proceedings*.
- Demirgüç-Kunt, A. and Servén, L. (2009). Are all the sacred cows dead? Implications of the financial crisis for macro and financial policies. Policy Research Working Paper 4807, World Bank, Washington, D.C.
- Demirgüç-Kunt, A. (2010). Microfinance: Dream vs. reality. *All about finance (blog)*, Finance and private sector research, World Bank.
- Demirgüç-Kunt, A. and Klapper, L. (2012). Measuring financial inclusion: The Global Financial Inclusion Index (Global Findex). The World Bank Development Research Group & Bill Gates Foundation.
- Dollar, D. & Kraay, A. Growth is good for the poor. *Journal of Economic Growth*, 7, 195-225.

- Dritsakis, N. & Adamopoulos, A. (2004). Financial development and economic growth in Greece: An empirical investigation with Granger causality analysis. *International Economic Journal*, 18(4), 547-59.
- Escobar, F. & Vasquez, C. (2002). *El impacto socioeconómico de las reformas financieras en Bolivia*. Documento de Trabajo - Instituto de Investigaciones Socio Económicas, UCB, La Paz.
- Favara, G. (2003). *An empirical reassessment of the relationship between finance and growth*. IMF Working Papers No. 03/123.
- Foronda, Carlos & Nogales, Ricardo (2010). *La profundidad del sistema financiero Boliviano: ¿Cuál es la contribución del sistema microfinanciero?* 3er Encuentro de Economistas de Bolivia, Banco Central de Bolivia.
- FINRURAL (2002). *Cobertura de servicios financieros por municipio a Junio 2001*. FINRURAL, La Paz, Bolivia.
- FINRURAL (2004a). *Dossier estadístico microfinanzas 1992-2002*. FINRURAL, La Paz, Bolivia.
- FINRURAL (2004b). *Boletín estadístico No. 17*, FINRURAL, La Paz, Bolivia.
- FINRURAL (2004c). *Cobertura de servicios financieros por municipio a Junio 2003*. FINRURAL, La Paz, Bolivia.
- Galor, O. & Zeira, J. (1993). Income distribution and macroeconomics. *Review of Economic Studies*, 60, 35-52.
- Geda, A., Shimeles, A. & Zerfu, D. (2006). *Finance and poverty in Ethiopia: A household level analysis*. Research Paper No. 2006/51, UNU-WIDER.
- Ghali, K. H. (1999). Financial development and economic growth: The Tunisian experience. *Review of Development Economics*, 3(3), 310-22.
- Guillaumont, S. & Kpodar, K. (2008). Financial development and poverty reduction: Can there be a benefit without a cost? IMF Working Paper, WP/08/62.
- Ghost, J. (2005). *The economic and social effects of financial liberalization: A primer for developing countries*. Working Paper No. 4, Department of Economic and Social Affairs, United Nations, New York.
- Gurgul, H. and Lukasz, L. (2011). Financial development and economic growth in Poland in transition: Causality analysis. MPRA Paper No. 38034.
- Haslag, J. & Koo, J. (2000). *Financial repression, financial development and economic growth*. Research Department – Federal Reserve of Dallas.
- Halicioglu, F. (2007). *The financial development and economic growth nexus for Turkey*. Department of Economics, Yeditepe University, Turkey, Munich Personal RePec Archive.
- Hamori, S. & Inoue, T. (2010). *How has financial development affected poverty reduction in India? Empirical analysis using state-level panel data*. IDE discussion paper No. 249, Institute of Developing Economics, Japan.
- Hannig, A. & Jansen, S. (2010). Financial inclusion and financial stability: Current policy issues. ADBI Working Paper Series No. 259, Asian Development Bank Institute.
- Hasan, I. & Zhou, M. (2006). Financial sector development and growth: The Chinese experience. United Nations University, UNU-WIDER, Research Paper No. 2006/85.
- Helms, B. (2007). Finance for all: building inclusive financial systems. Consultative group to assist the poor (CGAP) – World Bank, Washington, D.C.
- Hernandez, L. & Parro, F. (2005). *Sistema financiero y crecimiento económico en Chile*. Estudios Públicos, Banco Central de Chile.
- Ho, S. & Odhiambo, N. (2011). Finance and poverty reduction in China: an empirical investigation. *International Business & Economics Research Journal*, 10:8, 103-114.
- Honohan, P. (2004a). *Financial development, growth, and poverty: how close are the links?* World Bank Policy Research Working Paper Series 3203.
- Honohan, P. (2004b). *Financial sector policy and the poor: Selected findings and issues*. Working Paper No. 43. Washington, D.C.: The World Bank.
- Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking & Finance*, 32, 2493–2500.
- Honohan, P. & King, M. (2009). Cause and effect of financial access: Cross-country evidence from the Finscope surveys. Trinity College Dublin, Draft version.
- Humérez, J. & Yáñez, E. (2010). *Desarrollo del sistema financiero y crecimiento económico: Una aproximación a partir del caso Boliviano: 2000-2009*. Tercer Encuentro Economistas de Bolivia, Banco Central de Bolivia.
- Hussain, F. & Chakraborty, K. (2012). Causality between financial development and economic growth: Evidence from an Indian State. *The Romanian Economic Journal*, 15:45, 27-47.

- Imai, K., Gaiha, R., Thapa, G., & Kobina, S. (2012) Microfinance and poverty: A macro perspective. *World Development*, 40:8, 1675–1689. <http://dx.doi.org/10.1016/j.worlddev.2012.04.013>.
- Instituto Nacional de Estadística (2006). *Anuario Estadístico 2005*. INE, La Paz, Bolivia.
- Islam, A. (2012). An empirical analysis of causality between development of non-bank financial intermediaries and the economic growth in Malaysia. *European Journal of Social Sciences*, 30:4, 654-664.
- Inoue, T. & Hamori, S. (2012). How has financial deepening affected poverty reduction in India? Empirical analysis using state-level panel data. *Applied Financial Economics*, 22, 395–408.
- Jalilian, H. & Kirkpatrick, C. (2005). Does financial development contribute to poverty reduction? *Journal of Development Studies*, 41:4, 636-56.
- Johannes, T., Njong, A. & Cletus, N. (2011). Financial development and economic growth in Cameroon, 1970-2005. *Journal of Economics and International Finance*. 3:6, 367-375.
- Karlan, D., & Morduch, J. (2010). Access to finance. Chapter 2 in D. Rodrik and M. Rosenzweig, eds., *Handbook of Development Economics*, vol. 5. Amsterdam: North-Holland.
- Kendall, J. (2009) *Local financial development and growth*. Policy research working paper 4838. The World Bank.
- Kenourgios, D. & Samitas, A. (2007). Financial development and economic growth in a transition economy: Evidence for Poland. *Journal of Financial Decision Making*, 3(1), 35-48.
- Khan, M. K., Usman, A. & Malik, M. I. (2011). Role of micro finance in reducing poverty: A look at social and economic factors. *International Journal of Business and Social Science*, 2:21, 138-144.
- Kibua, T. (2007). Poverty reduction through enhanced access to financial services: Case studies of Botswana, Kenya and Namibia. Occasional Paper No. 010/2007, A Southern and Eastern Africa Policy Research Network Research, IPAR Occasional Paper Series.
- Klapper, L., Laeven L., & Rajan R. (2004). *Business environment and firm entry: Evidence from international data*. World Bank Policy Research Working Paper, No. 3232.
- Klasen, S. et al. (2004). *Operationalising Pro-poor growth: a country case study on Bolivia*. A joint initiative of AFD, BMZ (GTZ, KfW Development Bank), DFID, and the World Bank.
- Koetter, M. & Wedow, M. (2006). Finance and growth in a bank-based economy: Is it quantity or quality that matters? Discussion Paper: Series 2: Banking and Financial Studies No. 02/2006, Deutsche Bundesbank, Frankfurt, Germany.
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Government Ownership of Commercial Banks. *The Journal of Finance*, 57 (1), 265–301.
- Law, S. & Tan, H. (2009). The role of financial development on income inequality in Malaysia. *Journal of Economic Development*, 34(2), .
- Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2), 688-726.
- Levine, R. & Zervos, S. (1998). *Stock markets, banks and economic growth*. Policy Research Working Paper Series No. 1690, World Bank.
- Levine, R. (2002). Bank-based or market-based financial systems: which is better? *Journal of Financial Intermediation*, 11(4), 398-428.
- Levine, R. (2003). More on finance and growth: more finance, more growth? *The Federal Reserve Bank*, St. Louis, 31-52.
- Levine, R. (2004). *Finance and growth: theory and evidence*. NBER Working Papers No. 10766.
- Levine, R. (2005). Finance and growth: theory and evidence. *Handbook of Economic Growth*, Elsevier, 865-934.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46(1), 31-77.
- Ljungwall, C. & Li, J. (2007). Financial sector development, FDI and economic growth in China. China Center for Economic Research, Working Paper Series, No. E2007005.
- Liang, Z. (2006). *Financial development and income inequality in rural China 1991-2000*. Centre d'Etudes et de Recherches sur le Développement International (CERDI), Université d'Auvergne, Clermont-Ferrand, France.
- Lopez, A. (2003). *Análisis de la relación entre intermediación crediticia y crecimiento económico en Venezuela*. Banco Central de Venezuela.

- Lopez, F. & Rodriguez, D. (2009). Desarrollo financiero y crecimiento económico en Mexico, *Problemas del desarrollo*, 6(159).
- Lopez, H. (2004). Pro-growth, pro-poor: Is there a tradeoff? World Bank Policy Research Working Paper Series No. 3378, World Bank.
- Majerbi, B. (2010). *Does institutional diversification of the financial system promote economic growth?* Faculty of Business, University of Victoria, Victoria, Canada (1st Draft).
- Majumder, A. & Eff, A. (2012) The link between economic growth and financial development: Evidence from districts of Bangladesh. *International Research Journal of Finance and Economics*, 99, 106-118.
- Manh Hao, Q. (2005). Access to finance and poverty reduction: An application to rural Vietnam. PhD Thesis, Department of Accounting and Finance, The University of Birmingham.
- Martin, D. & Mendieta, P. (2009). En busca de los determinantes del crecimiento económico Boliviano. Documento de Trabajo, Encuentro de Economistas de Bolivia, Banco Central de Bolivia.
- Mishkin, F. (2005). *Is financial globalization beneficial?* NBER Working Paper 11891, National Bureau of Research in Economics, Massachusetts.
- Morales, J. A. (2007). *Profundización financiera y crecimiento económico en Bolivia*. Documento de Trabajo No. 05/07, Instituto de Investigaciones Socio-Económicas, La Paz, Bolivia.
- Morales, R., Galoppo, E., Jemio, L., Choque, M. & Morales, N. (2000). *Bolivia: Geografía y desarrollo económico*. Inter-American Development Bank, Latin American Research Network, Research Network Working Paper #R-387.
- Morduch, J. (2011). *Ten research questions on improving financial access*. Blog Financial Access Initiative (FAI), October 2011.
- Motonishi, T. (2004). Financial development and income inequality increase in Thailand, in *Macroeconomic Aspects of Imperfect Financial Markets*, PhD Thesis, University of Tokyo, Japan.
- Mosley, P. (2001). Microfinance and poverty in Bolivia. *The Journal of Development Studies*, Vol. 37, No. 4, 101–132.
- Murinde, V. & Eng, F. (1994). Financial development and economic growth in Singapore: Demand following or supply leading? *Applied Financial Economics*, 4, 391-404.
- Nasr, S. (2010). *Access to finance and economic growth in Egypt*. World Bank.
- Ngai Wa, H. (2002). *Finance and growth: The case of Macau*. Monetary Authority of Macau.
- Nimal, F. (2007). *Low-income households' access to financial services: International experience, measures for improvement, and the future*. EARD Special Studies, Asian Development Bank.
- Odhiambo, N. (2007). Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modeling*, 25(4), 704-713.
- Odhiambo, N. (2010). Is financial development a spur to poverty reduction? Kenya's experience. *Journal of Economic Studies*, 37(3), 343- 353.
- Ordóñez, P. (2012). Financial development and poverty: A panel data analysis. Research Paper Series; Borradores de Economía y Finanzas, 31, Universidad ICESI-School of Management & Economics.
- Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review*, 37, 613-622, North-Holland.
- Paudel, R. & Perera, N. (2009). Financial development and economic growth in Sri Lanka. *Applied Econometrics and International Development*, 9(1).
- Peachey, S. & Roe A. (2004). *Access to Finance*. A Study for the World Savings Banks Institute. Oxford Policy Management.
- Pinar, O., Heimann, M. & Mylenko, N. (2011). Access to financial services and the financial inclusion agenda around the world: A cross-country analysis with a new data set. Policy Research Working Paper 5537, World Bank.
- Prakash, R. (2009). The nexus between financial development and economic growth in India: Evidence from multivariate VAR model. *International Journal of Research and Reviews in Applied Sciences*, 1(2), 141-151.
- Prado, F. & Collao, K. (2005). *La industria de las microfinanzas en Bolivia: Diagnostico al 2004*.
- PROFIN (2009). *Diagnostico servicios financieros*: Executive summary. PROFIN-COSUDE, La Paz, Bolivia.
- Quartey, P. (2005). *Financial sector development, savings mobilization and poverty reduction in Ghana*. Research Paper No. 2005/71, UNU-WIDER.

- Quiroz, J. & Dorado, H. (2006). Una aproximación de los determinantes del crecimiento económico en Bolivia: 1960-2004. *Revista de Análisis Económico*, 21, UDAPE, Bolivia.
- Rahman, H. (2004). Financial development – Economic growth nexus: A case study for Bangladesh. *The Bangladesh Development Studies*, 30(2 & 3), 113-128.
- Rajan, R., & Zingales, L. (2003). *Saving Capitalism from the Capitalists*. New York: Crown Business.
- Rhyne, E. (2001). *How lending to the poor began, grew, and came of age in Bolivia: Mainstreaming microfinance*. Kumarian Press, Canada.
- Rodríguez-Gámez, L.I. & Rodríguez-López, M. (2013). Convergence across Mexican municipalities: The local approach (Preliminary Version). Special session on: Dynamics, Economic Growth, and International Trade (DEGIT – XVIII); Lima, Peru, 26-27 September, 2013.
- Shahbaz, M. & Islam, F. (2011). *Financial development and income inequality in Pakistan: An application of ARDL approach*. MPRA Paper No. 28222, Munich Personal RePEc Archive.
- Shahbaz, M., Aviral, T. and Sherafatian-Jahromi, R. (2012). Financial development and income inequality: is there any financial Kuznets curve in Iran? Munich Personal RePEc Archive, MPRA Paper No. 40899.
- Snyder, R. (2001). Scaling down: The subnational comparative method. *Studies in Comparative International Development*, 36 (1), 93–110.
- Sunde, T. (2011). Financial sector development and economic growth in Namibia. *Journal of Emerging Trends in Economics and Management Sciences*, 1(2), 76-80.
- Thangavelu, S. & Beng, J. (2004). Financial development and economic growth in Australia: An empirical analysis. *Empirical Economics*, 29(2), 247-60.
- Umesh Arora, R. (2012). Finance and inequality: a study of Indian states. *Applied Economics*, 44, 4527–4538.
- Unidad de Análisis de Políticas Económicas (2006). *Pobreza y desigualdad de municipios en Bolivia*, UDAPE, La Paz, Bolivia.
- Vaona, A. (2008). Regional evidence on financial development, finance term structure and growth. *Empirical economics: A quarterly journal of the Institute for Advanced Studies*, 34(1), 185-202.
- Valev, N. (2008). Financial development and economic growth in Bulgaria. Working paper, Georgia State University.
- Vargas, M. (2004). *Un estudio espacial sobre la pobreza municipal en Bolivia*. Documento de Trabajo UDAPE, UDAPE-PNUD, La Paz – Bolivia.
- Verbeek, M. (2000). *A guide to modern econometrics*. West Sussex, England: John Wiley & Son, Ltd..
- Waqabaca, C. (2004). *Financial development and economic growth in Fiji*. Working paper 2004/03, Economics Department Reserve Bank of Fiji.
- Weiss, J. & Montgomery, H. (2005). Great expectations: Microfinance and poverty reduction in Asia and Latin America. *Oxford Development Studies*, 33(3&4), September–December 2005, 391-416.
- World Bank (1994). *How legal restrictions on collateral limit access to credit in Bolivia*. Office of the Chief Economist.
- World Bank (2013). World development indicators (data set).
- World Bank (2014). *Global financial development report, 2014: Financial Inclusion*. Washington, DC: World Bank. doi:10.1596/978-0-8213-9985-9.
- Yang, Y. & Hoon, M. (2008). Does financial development cause economic growth? Implications for policy in Korea. *Journal of Policy Modeling*, 30(5), 827-840.
- Zhang, J., Wang, L. & Wang, S. (2012). Financial development and economic growth: Recent evidence from China. *Journal of Comparative Economics*, 40, 393–412.

Annexes

Annex 3.1. Bolivia: Financial development indicators (1960-2011)*

Period	M2/GDP	M3/GDP	Private credit/GDP
1960	6.44		1.11
1961	6.99	6.39	1.48
1962	7.29	6.82	1.67
1963	8.12	7.33	3.48
1964	8.76	8.27	4.32
1965	9.22	8.48	4.23
1966	10.61	9.51	4.62
1967	10.42	10.13	4.65
1968	14.01	13.49	7.11
1969	14.55	13.78	7.60
1970	15.83	14.74	8.78
1971	17.36	15.95	9.11
1972	17.01	14.23	10.13
1973	14.94	12.40	10.99
1974	12.97	12.28	10.53
1975	13.95	12.76	11.68
1976	18.11	15.13	13.67
1977	19.84	17.52	15.87
1978	19.26	17.88	17.31
1979	18.44	15.93	17.88
1980	20.78	17.81	17.09
1981	20.36	19.33	16.66
1982	27.12	16.09	27.09
1983	21.11	12.83	17.14
1984	20.95	7.48	14.30
1985	12.14	5.41	19.04
1986	10.74	7.92	12.83
1987	17.93	13.56	15.49
1988	18.84	16.93	17.14
1989	19.48	17.37	20.71
1990	24.47	19.58	24.03
1991	29.78	25.09	28.66
1992	34.80	30.79	36.30
1993	41.88	36.72	45.50
1994	46.04	41.36	49.94
1995	42.49	40.80	48.20
1996	51.03	44.20	52.74
1997	54.72	49.78	58.28
1998	55.20	52.43	64.05
1999	55.40	54.26	64.45
2000	52.18	52.19	58.72
2001	59.42	55.01	53.56
2002	54.10	54.98	51.00
2003	56.24	52.64	47.88
2004	46.35	48.13	42.65
2005	49.07	44.58	45.03
2006	51.10	43.64	37.80
2007	57.41	48.74	36.97
2008	60.13	53.09	34.69
2009	66.65	61.64	37.02
2010	67.57	62.19	40.34
2011	68.72		40.86

*M2/GDP and Private Credit /GDP are from WDI, while M3/GDP is from the Financial Structure dataset.

Source: Author's own preparation on basis of WDI (2012) and Beck & Mohseni-Cheraghlou (2012)

Annex 3.2. Latin America and the Caribbean: Indicators of access to finance (2003)

Country	Total number of bank branches	Total number of ATMs	Number of branches per 100,000 people	Number of branches per 1,000 sq km	Number of ATMs per 100,000 people	Number of ATMs per 1,000 sq km
Argentina	3,841	5,721	10.01	1.40	14.91	2.09
Belize	38	.	14.67	1.67	.	.
Bolivia	137	431	1.53	0.13	4.80	0.40
Brazil	25,763	31,471	14.59	3.05	17.82	3.72
Chile	1,481	3,790	9.39	1.98	24.03	5.06
Colombia	3,880	4,262	8.74	3.74	9.60	4.10
Costa Rica	384	514	9.59	7.52	12.83	10.07
Dominican Republic	524	1,318	6.00	10.83	15.08	27.24
Ecuador	1,212	823	9.30	4.38	6.32	2.97
El Salvador	302	723	4.62	14.58	11.07	34.89
Guatemala	1,246	2,486	10.12	11.49	20.20	22.93
Guyana	24	50	3.12	0.12	6.50	0.25
Honduras	51	248	0.73	0.46	3.56	2.22
Mexico	7,806	17,011	7.63	4.09	16.63	8.91
Nicaragua	156	143	2.85	1.29	2.61	1.18
Panama	384	483	12.87	5.16	16.19	6.49
Peru	1,133	1,587	4.17	0.89	5.85	1.24
Trinidad and Tobago	121	269	9.22	23.59	20.49	52.44
Uruguay	216	.	6.39	1.23	.	.
Venezuela	1,127	4,242	4.41	1.28	16.60	4.81

Source: Author's own preparation on basis of Beck et al. (2007b)

Annex 3.3. Bolivia: Selected indicators of income inequality and poverty (Available years)

Indicators/Period	1991	1997	1999	2000	2002	2005	2007
GINI index	42.04	58.46	57.79		60.24	58.19	57.19
Poverty headcount ratio at \$1.25 a day (PPP) (% of population)	4.03	18.94	24.70		22.81	19.62	11.86
Poverty headcount ratio at \$2 a day (PPP) (% of population)	17.26	29.87	35.57		34.17	30.35	21.90
Poverty headcount ratio at national poverty line (% of population)		63.20	62.70	45.20	65.20		37.70
Poverty headcount ratio at rural poverty line (% of rural population)		77.30	81.70	75.00	83.50		63.94
Poverty headcount ratio at urban poverty line (% of urban population)		53.80	50.55	27.90	53.90		23.67
Poverty gap at \$1.25 a day (PPP) (%)	0.50	8.89	14.57		12.36	9.70	5.59
Poverty gap at \$2 a day (PPP) (%)	4.27	14.31	20.46		18.46	15.48	9.54

Source: Author's own preparation on basis of WDI data (2010)

Annex 3.4. Bolivia: Evolution of the number of bank and non-bank branches (1986-2003)

Period	Banks			S&L mutuals			Credit unions			Financial private funds			NGOs			Total non-bank			TOTAL		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
1986	75	33	108																75	33	108
1989	118	24	142																118	24	142
1990	117	21	138									4	1	5	4	1	5	121	22	143	
1991	136	20	156	15	2	17						5	4	9	20	6	26	156	26	182	
1992	171	12	183	17	4	21	18	5	23			8	7	15	43	16	59	214	28	242	
1993	208	41	249	20	7	27	32	9	41			10	15	25	62	31	93	270	72	342	
1994	198	46	244	18	6	24	33	12	45			17	31	48	68	49	117	266	95	361	
1995	220	58	278	17	7	24	24	14	38			24	38	62	65	59	124	285	117	402	
1996	230	55	285	20	7	27	26	19	45	13	1	14	51	54	105	110	81	191	340	136	476
1997	247	29	276	24	9	33	45	36	81	20	1	21	52	79	131	141	125	266	388	154	542
1998	252	71	323	26	10	36	52	35	87	38	3	41	49	95	144	165	143	308	417	214	631
1999	262	72	334	26	10	36	68	35	103	42	3	45	69	116	185	205	164	369	467	236	703
2000	278	77	355	26	10	36	51	39	90	59	42	101	59	71	130	195	162	357	473	239	712
2001	214	43	257	32	10	42	47	44	91	63	47	110	58	94	152	200	195	395	414	238	652
2002	184	46	230	36	9	45	32	28	60	75	45	120	73	114	187	216	196	412	400	242	642
2003	190	51	241	34	9	43	45	41	86	92	44	136	76	120	196	247	214	461	437	265	702

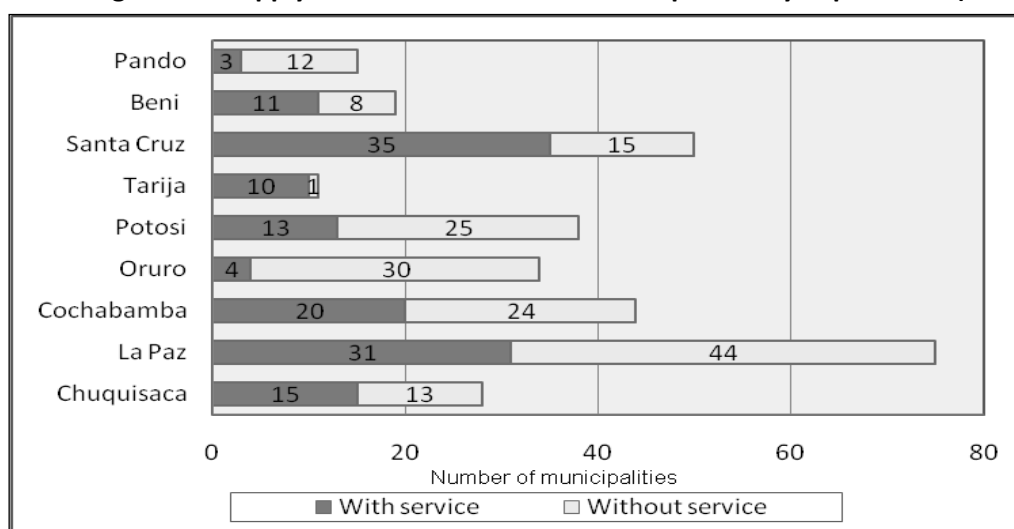
Source: Author's own preparation on basis of FINRURAL data (2003)

Annex 3.5. Bolivia: Supply of financial services by municipality, June 2003

Department	Municipalities			Network of Agencies of the Financial System					Total
	Total	With service	Without service	Banks	S&L Mutuals	Credit Unions	PFFs	NGOs	
Urban Agencies	10	10	0	190	34	45	92	76	437
Chuquisaca	1	1	0	9	1	2	6	10	28
La Paz	2	2	0	66	22	0	35	26	149
Cochabamba	1	1	0	35	2	8	14	11	70
Oruro	1	1	0	7	1	0	3	5	16
Potosi	1	1	0	3	1	0	3	6	13
Tarija	1	1	0	7	1	7	6	8	29
Santa Cruz	1	1	0	58	4	26	21	9	118
Beni	1	1	0	4	1	1	3	0	9
Pando	1	1	0	1	1	1	1	1	5
Percentage	100.00%	100.00%	0.00%	43.48%	7.78%	10.30%	21.05%	17.39%	100.00%
Rural Agencies	304	102	202	51	9	41	44	120	265
Chuquisaca	27	9	18	2	1	4	2	12	21
La Paz	73	24	49	7	1	0	9	35	52
Cochabamba	43	16	27	3	0	6	11	22	42
Oruro	33	2	31	0	0	0	0	5	5
Potosi	37	10	27	6	2	4	4	13	29
Tarija	10	8	2	7	1	8	3	10	29
Santa Cruz	49	25	24	19	2	18	11	22	72
Beni	18	8	10	7	2	1	4	1	15
Pando	14	0	14	0	0	0	0	0	0
Percentage	100.00%	33.55%	66.45%	19.25%	3.40%	15.47%	16.60%	45.28%	100.00%
Total Department	314	112	202	241	43	86	136	196	702
Chuquisaca	28	10	18	11	2	6	8	22	49
La Paz	75	26	49	73	23	0	44	61	201
Cochabamba	44	17	27	38	2	14	25	33	112
Oruro	34	3	31	7	1	0	3	10	21
Potosi	38	11	27	9	3	4	7	19	42
Tarija	11	9	2	14	2	15	9	18	58
Santa Cruz	50	26	24	77	6	44	32	31	190
Beni	19	9	10	11	3	2	7	1	24
Pando	15	1	14	1	1	1	1	1	5
TOTAL	100.00%	35.67%	64.33%	34.33%	6.13%	12.25%	19.37%	27.92%	100.00%

Source: Author's own preparation on basis of FINRURAL data

Annex Figure 3.1. Supply of financial services in municipalities by department (2008)



Source: Author's own preparation on basis of PROFIN data (2009)

Annex 3.6. Descriptive statistics variables, Bolivian municipalities dataset

Variable	Obs	Mean	Std. Dev.	Min	Max
access	314	2.633758	13.7577	0	169
formal	314	1.961783	11.28339	0	144
microfinance	314	1	4.105634	0	37
semiform	314	.6719745	2.872817	0	31
accessadult	314	1.019466	1.853043	0	11.09567
accesspob	314	.4749459	.8776746	0	5.117707
formalpob	314	.3201733	.6679973	0	4.828585
formaladult	314	.6777521	1.36943	0	8.84171
semiformpob	314	.1547726	.4382223	0	5.117707
semiformadul	314	.3417135	.9637437	0	11.09567
microfinpob	314	.2146189	.508428	0	5.117707
microfinadul	314	.4673854	1.107188	0	11.09567
growthvarY	314	.0035518	.0134753	-.0342558	.0389367
gdpperca	314	802.2448	352.9469	245.3159	2565.286
NBI01	314	84.23405	17.88176	19.07955	100
poverty	314	83.7414	11.86686	43	99.9
health	314	.5999735	.0844771	.255757	.7540761
education	314	.6476708	.1048148	.3375541	.8710472
urban	314	.4044586	.4915703	0	1
bigurban	314	.0764331	.2661139	0	1
smallurban	314	.3280255	.4702435	0	1
Urbanrate	314	18.88894	28.38103	0	99.93405
popgr01	307	14.37959	73.65115	-88.83321	1169.727
ferrate	314	5.605096	1.192136	2.7	8.3
grpop9201	314	2.259713	2.531924	-4.2	16.43
Etno	314	42.04492	19.28806	.8056395	71.04072
Income01	314	.4040651	.0843283	.1801193	.6569736
Income05	314	.407617	.0947619	.1577207	.682866
Valley	314	.5	.5007981	0	1
Lowlands	314	.2070064	.4058068	0	1
Elevation	314	1688.592	1383.677	115	4000
Temperat	314	15.94904	7.166367	0	28
Precipit	314	989.5701	601.9775	0	2750
lifeexp	314	60.4793	5.031728	40.34542	70.24456
lnelevation	314	6.84588	1.28764	3.218876	8.29405
lnetno	314	3.514109	.8531995	-.2161189	4.263253
lnhealth	314	-.5219737	.1543412	-1.363528	-.282262
lngdpperca	314	6.600888	.4163333	5.502547	7.849825
lnlifeexp	314	4.098685	.0862761	3.697478	4.251983
lnNBI01	314	4.401743	.2789825	2.948617	4.60517
lnpoverty	314	4.416446	.1555392	3.7612	4.60417
lnedu	314	-.4487867	.1749925	-1.08603	-.1380591
accessarea	314	3.856019	23.3481	0	340.5062
formalarea	314	2.642758	16.05491	0	231.6846
semiforarea	314	1.213261	7.670956	0	108.8216
microfinarea	314	1.729256	10.09206	0	129.8838

Source: Author's own preparation on basis of data analysis

Annex 3.7. Correlation matrix (geographical indicators)

	bigurban	smallurban	urban	Valley	Lowlands	lnelevation	Temperat
bigurban	1.0000						
	314						
smallurban	-0.2010	1.0000					
	0.0003	314					
urban	0.3491	0.8340	1.0000				
	0.0000	0.0000	314				
	314	314	314				
Valley	0.0240	-0.0068	0.0065	1.0000			
	0.6722	0.9047	0.9088	314			
	314	314	314	314			
Lowlands	0.0009	0.2290	0.2196	-0.5109	1.0000		
	0.9867	0.0000	0.0001	0.0000	314		
	314	314	314	314	314		
lnelevation	-0.0201	-0.3637	-0.3553	0.0635	-0.7241	1.0000	
	0.7228	0.0000	0.0000	0.2618	0.0000	314	
	314	314	314	314	314	314	
Temperat	0.0665	0.3193	0.3351	0.0859	0.6353	-0.8572	1.0000
	0.2397	0.0000	0.0000	0.1288	0.0000	0.0000	314
	314	314	314	314	314	314	314
Precipit	0.0389	0.3547	0.3603	0.0412	0.5627	-0.7831	0.6657
	0.4922	0.0000	0.0000	0.4670	0.0000	0.0000	0.0000
	314	314	314	314	314	314	314

Source: Author's own preparation on basis of data analysis

Annex 3.8. Correlation Matrix (Financial access indicators)

	access	formal	microfinance	semiform	accessadult	accesspob	formalpob	formaladult	semiformpob	semiformadult	microfinpob
access	1.0000										
formal	0.9931	1.0000									
microfinance	0.9307	0.8846	1.0000								
semiform	0.8882	0.8284	0.9827	1.0000							
accessadult	0.2044	0.1857	0.2578	0.2492	1.0000						
accesspob	0.2332	0.2144	0.2862	0.2749	0.9854	1.0000					
formalpob	0.2407	0.2369	0.2533	0.2223	0.8432	0.8737	1.0000				
formaladult	0.2176	0.2137	0.2316	0.2023	0.8631	0.8722	0.9914	1.0000			
semiformpob	0.1003	0.0683	0.1872	0.2118	0.6882	0.6710	0.2256	0.2356	1.0000		
semiformadult	0.0838	0.0534	0.1667	0.1917	0.6864	0.6553	0.2126	0.2385	0.9884	1.0000	
microfinpob	0.1345	0.1034	0.2365	0.2379	0.7914	0.7808	0.4115	0.4213	0.9366	0.9230	1.0000
microfinadult	0.1149	0.0850	0.2130	0.2161	0.7968	0.7640	0.3910	0.4158	0.9342	0.9413	0.9904

Source: Author's own preparation on basis of data analysis

Annex 3.9 Correlation Matrix of the complete data set

	micro		access		access	formal	formal	semiform	semiform	microfin	microfin	Initial		big		small	Urban	Income		Income																
	access	formal	finance	semiform	adult	pob	pob	adult	pob	adul	pob	adul	growth	growth1	gdpper	avrgedu	edurate	nbi01	poverty	poversev	poverext	health	edu	rural	urban	urban	urban	rate	popgr01	ferrate	Etno	2001	2005			
access	1.00																																			
formal	0.99	1.00																																		
microfinance	0.93	0.88	1.00																																	
semiform	0.89	0.83	0.98	1.00																																
accessadult	0.20	0.19	0.26	0.25	1.00																															
accesspob	0.23	0.21	0.29	0.27	0.99	1.00																														
formalpob	0.24	0.24	0.25	0.22	0.84	0.87	1.00																													
formaladult	0.22	0.21	0.23	0.20	0.86	0.87	0.99	1.00																												
semiformpob	0.10	0.07	0.19	0.21	0.69	0.67	0.23	0.24	1.00																											
semiformadul	0.08	0.05	0.17	0.19	0.70	0.66	0.21	0.24	0.99	1.00																										
microfinpob	0.13	0.10	0.24	0.24	0.79	0.78	0.41	0.42	0.94	0.92	1.00																									
microfinadul	0.11	0.09	0.21	0.22	0.80	0.76	0.39	0.42	0.93	0.94	0.99	1.00																								
growth	0.13	0.12	0.16	0.15	0.27	0.27	0.30	0.31	0.09	0.09	0.15	0.15	1.00																							
growth1	0.19	0.17	0.22	0.21	0.31	0.31	0.34	0.35	0.10	0.10	0.17	0.16	0.96	1.00																						
Initial-gdpper	0.53	0.51	0.54	0.52	0.37	0.40	0.46	0.45	0.10	0.08	0.18	0.15	0.61	0.67	1.00																					
avrgedu	0.38	0.36	0.41	0.38	0.24	0.27	0.36	0.34	0.00	-0.02	0.06	0.03	0.60	0.60	0.76	1.00																				
edurate	0.18	0.16	0.22	0.21	0.21	0.21	0.20	0.20	0.12	0.11	0.19	0.17	0.27	0.28	0.35	0.25	1.00																			
nbi01	-0.42	-0.41	-0.44	-0.43	-0.41	-0.43	-0.49	-0.48	-0.12	-0.10	-0.20	-0.18	-0.54	-0.64	-0.85	-0.63	-0.36	1.00																		
poverty	-0.35	-0.34	-0.36	-0.35	-0.20	-0.23	-0.28	-0.26	-0.03	-0.01	-0.08	-0.06	-0.51	-0.54	-0.85	-0.67	-0.25	0.60	1.00																	
poversev	-0.19	-0.18	-0.21	-0.20	-0.17	-0.20	-0.24	-0.23	-0.03	-0.01	-0.08	-0.06	-0.66	-0.59	-0.73	-0.70	-0.23	0.43	0.85	1.00																
poverext	-0.35	-0.33	-0.37	-0.36	-0.33	-0.35	-0.40	-0.40	-0.08	-0.07	-0.16	-0.14	-0.65	-0.69	-0.93	-0.74	-0.33	0.74	0.93	0.86	1.00															
health	0.19	0.19	0.20	0.19	0.27	0.27	0.31	0.32	0.08	0.08	0.13	0.13	0.63	0.59	0.59	0.52	0.26	-0.49	-0.48	-0.57	-0.58	1.00														
edu	0.28	0.27	0.31	0.29	0.25	0.28	0.35	0.33	0.04	0.01	0.10	0.07	0.62	0.60	0.69	0.87	0.55	-0.57	-0.61	-0.68	-0.70	0.55	1.00													
rural	-0.22	-0.21	-0.26	-0.24	-0.44	-0.44	-0.50	-0.52	-0.12	-0.12	-0.24	-0.23	-0.46	-0.52	-0.57	-0.42	-0.31	0.61	0.30	0.28	0.53	-0.38	-0.44	1.00												
urban	0.22	0.21	0.26	0.24	0.44	0.44	0.50	0.52	0.12	0.12	0.24	0.23	0.46	0.52	0.57	0.42	0.31	-0.61	-0.30	-0.28	-0.53	0.38	0.44	-1.00	1.00											
bigurban	0.50	0.47	0.56	0.53	0.21	0.24	0.27	0.26	0.05	0.04	0.11	0.09	0.23	0.31	0.62	0.53	0.20	-0.60	-0.44	-0.28	-0.50	0.26	0.38	-0.35	0.35	1.00										
smallurban	-0.05	-0.05	-0.04	-0.05	0.35	0.33	0.37	0.40	0.10	0.11	0.19	0.20	0.35	0.36	0.24	0.14	0.21	-0.29	-0.05	-0.12	-0.26	0.25	0.23	-0.83	0.83	-0.20	1.00									
Urbanrate	0.42	0.40	0.48	0.45	0.47	0.47	0.54	0.55	0.12	0.12	0.21	0.21	0.44	0.53	0.77	0.64	0.35	-0.78	-0.47	-0.37	-0.68	0.48	0.57	-0.80	0.80	0.67	0.46	1.00								
popgr01	-0.03	-0.03	-0.05	-0.05	0.12	0.14	0.23	0.22	-0.06	-0.07	-0.06	-0.07	0.06	0.08	0.05	0.13	-0.19	-0.06	-0.01	-0.06	-0.04	0.04	0.06	0.01	-0.01	-0.03	0.01	0.02	1.00							
ferrate	-0.28	-0.26	-0.31	-0.30	-0.27	-0.30	-0.28	-0.26	-0.17	-0.15	-0.22	-0.20	-0.45	-0.44	-0.54	-0.56	-0.26	0.52	0.42	0.50	0.48	-0.47	-0.53	0.23	-0.23	-0.36	-0.02	-0.37	-0.10	1.00						
Etno	-0.08	-0.08	-0.06	-0.06	-0.14	-0.13	-0.19	-0.20	0.02	0.01	-0.01	-0.01	-0.33	-0.34	-0.37	-0.22	-0.09	0.34	0.40	0.33	0.44	-0.38	-0.22	0.26	-0.26	-0.15	-0.18	-0.30	0.04	-0.05	1.00					
Income2001	0.37	0.35	0.39	0.38	0.36	0.38	0.44	0.43	0.09	0.08	0.18	0.16	0.74	0.74	0.95	0.77	0.36	-0.77	-0.85	-0.86	-0.95	0.66	0.74	-0.57	0.57	0.50	0.31	0.70	0.05	-0.56	-0.40	1.00				
Income2005	0.35	0.34	0.38	0.37	0.37	0.38	0.44	0.43	0.10	0.09	0.18	0.16	0.79	0.80	0.94	0.77	0.36	-0.78	-0.84	-0.85	-0.95	0.67	0.75	-0.58	0.58	0.48	0.33	0.70	0.05	-0.56	-0.40	0.98	1.00			

Source: Author's own preparation on basis of data analysis

Chapter 4

Alternative financial access mechanisms in Bolivia: The promising role of value chain finance

Abstract

Empirical evidence suggests that in developing countries such as Bolivia, inclusive financial initiatives such as microfinance and financial intermediary diversification would have a positive effect on economic growth and poverty reduction. However, we must also recognize that financial access is still very limited for many agents such as small and micro-sized firms and also rural and poor individuals in Bolivia. In the search for alternatives to make finance accessible for these types of agents, the present study highlights the importance of value chains as an alternative to enable and expand financial access for those actors (mainly micro, small, and rural agents) who usually are not served by the financial system. With this purpose, after reviewing the current diverse literature related to the topic, our original empirical evidence covers as a case study the dairy chain of Cochabamba, Bolivia. In this value chain case study, we identify which types of financial mechanisms are actually reached by value chain actors. In general, access to finance appears to be an important factor in determining the upgrading of the whole chain and particularly in improving the situation of poor actors such as milk farmers. Supporting this understanding, our panel data evidence suggests that expanding access to credit by particular value chain mechanisms has a positive effect on the production patterns of milk farmers. Our case study analysis also reveals that poor actors – mainly small milk farmers – have very remote chances of accessing finance if they are not part of a value chain. The contractual relationship that farmers have with a large and “creditworthy” actor appears to be the “magical key” that opens certain financial access mechanisms for them. Therefore, direct and indirect value chain mechanisms act as a way to access finance. However, our case study also identifies some limitations of value chain finance and points to the need to strengthen indirect value chain finance. Additionally, our case study reveals the important influence exerted by value chain governance, foreign direct investment, and social capital on financial access for poor actors of a value chain. Furthermore, the set of financial characteristics of the actors/firms involved in the dairy chain in Cochabamba seems consistent with the existing literature regarding international patterns of financing of small and medium firms.

4.1 Introduction

As part of the main findings of this thesis, we have found evidence that seems to support the hypothesis that financial development is an important factor in promoting growth and reducing income inequality in Latin American and Caribbean countries, including Bolivia. However, we have also taken into account that financial development does not necessarily mean that finance is available for all on an equal basis. Therefore, in Chapter 2 the role of financial access on economic growth and poverty in the case of Bolivia was evaluated.

The main empirical findings of the previous chapter highlight the importance of access to finance as a pro-growth and pro-poor factor in Bolivia. Consequently, inclusive finance initiatives such as microfinance and financial intermediary diversification that have taken place in the country could have had a positive effect on economic growth and poverty reduction¹. Yet we also have to recognize that financial access is still very limited for many agents such as small and micro-sized firms and also rural and poor individuals in Bolivia.

In fact, while Bolivia is a fascinating case worldwide of microfinance² advancing far within a short time, we have to be aware that microfinance institutions (MFIs) have had a limited effect reaching rural “poor” agents in the country. Despite the significant presence of semiformal MFIs in the rural area and the incessant rise of the loan portfolio in the rural region, around 67% of the microfinance sector loan portfolio is still in urban areas. Farming credit represents only 6% of the total loan portfolio of the financial system, with 3% corresponding to MFIs (Asociación de Entidades Microfinancieras [ASOFIN], 2012; Asociación de Instituciones Financieras para el Desarrollo Rural [FINRURAL], 2012; Instituto Nacional de Estadística [INE], 2012). The challenge to reach these rural agents becomes transcendental if we consider that around 64% of the rural population in Bolivia lives below the poverty line (World Bank [WB], 2012).

Access to finance is essential for poor agents in order to take business opportunities, to increase human capital investment, to expand income generating activities, and also to cope with shocks and life cycle events. People who are in a poverty situation, principally those living in rural areas³, require financial services just as any other people who are not poor (Habyalimana, 2007).

Traditionally, most regular banks and microfinance institutions have avoided rural finance since this is perceived as risky and costly, with cash flow requirements that are irregular and difficult to manage. Banks shy away from the high transaction costs and risks related to agriculture such as crop failure, diseases and market fluctuations. Also the lack of physical collateral is a restriction, and the risk of political interference that can damage the repayment behaviour of the rural clientele is high. Most microfinance institutions opt for high-density urban or peri-urban areas where they serve their clients in standardized – often group based – systems, usually unfit for the needs of small farmers (Peppelenbos 2010, p. xii).

With traditional and new sources of credit being limited or even closed to low-income and rural agents, value chains are appearing as an alternative to provide access to finance. A value chain consists of the series of actors – in the case of agriculture; actors include suppliers of material inputs, producers, processors, brokers, wholesalers, and retailers – that bring a good from production to the final consumer. The exchange of goods for payment along the value chain creates opportunities for

¹ If financial systems were not inclusive, poor individuals and small enterprises would have to rely on their own resources to make true investment in human capital or to take advantage of auspicious growth opportunities. Limited access to finance, even in a scenario of a well-developed financial system, will diminish the benefit of financial development for many households and firms, leaving many of them in poverty. Therefore, financial sector policies that promote competition give the right incentives to individuals and help remove financial access barriers, thus leading to growth, inequality reduction, and poverty alleviation (Beck et al, 2008c).

² Peru and Bolivia lead the microfinance industry at the global level. They occupy first and second place, respectively, in the 2012 ranking of Microfinance (Global Microscopy) prepared by the Economist Intelligence Unit.

³ Statistics show that in Bolivia around 60% of the population is poor and that around 55% of the poor live in rural areas (INE, 2011).

extending credit and other financial services to otherwise “unbankable” populations. Frequently referred to as direct value chain finance, these loans often take the form of direct advances by an agribusiness firm providing seeds and fertilizer as in-kind credit to small-scale farmers. Loans are typically repaid by deducting subsequent payment to farmers upon product delivery. In an alternate arrangement – known as indirect value chain finance – a third-party financial institution provides credit secured against either warehouse receipts or assignment of payment for future product deliverables (USAID, 2005)⁴.

Through value chain finance (VCF), small-scale farmers, farmer groups, and traders achieve better access to finance. Value chain finance breaks with the prerequisite to have hard collateral to access credit. The business relationships existent between the chain actors replace the need for hard collateral. When a buyer with a reputation as a creditworthy purchaser or processor is willing to vouch for its suppliers (farmer or producers), even small agents become more attractive clients to financial institutions. Evidently, limitations to credit provision are fewer, the terms and services are better, and the loans reflect the cash flow pattern of the business activities (UNCTAD, 2004; USAID, 2005)⁵.

By following a value chain approach, financial intermediaries may benefit from contractual relationships with processors or traders to expand finance. For example, a dairy processor with a good reputation could “give its word” for the small milk farmers who supply it with raw milk, making them creditworthy for financial institutions. Value chain financing has thus become an issue of special interest not only to academics but also to development planners, governments, international organizations, donors, and financing practitioners around the world. Nevertheless, value chain finance is not entirely new. Particularly in farming, much of what it offers currently is no newer than most other forms of finance. What is new are the numerous new ways of providing such financing, particularly regarding indirect value chain finance (Miller & Da Silva, 2007; Habyalimana, 2007).

Even though value chain finance appears to be an alternative to financial access, we must also be aware of its limitations (Beggs, 2010). Conn, Campion, and Wenner (2010) consider that VCF is intimately linked with value chain development, and certainly value chains have a number of limitations and weaknesses that have to be overcome to permit an expansion and ultimately a better flow of finance. Among these limitations, the authors point to poor contract enforcement, a proliferation of grades and standards, the scarcity of independent quality assurance laboratories, abuse of market power, limited loan capital, non-transparency in pricing of credit and technical assistance packages, and lack of agents willing and able to assume the expense of organizing and training small farmers to participate in well-structured value chains. With specific regard to financing, the anchor firms in the chain – who usually can access formal finance and then on-lend to others in the chain – many times face debt equity constraints and limitations on what is acceptable as collateral. Other times these anchor firms are not well structured enough to operate a financing scheme, since it is not a core competency. Additionally, when formal financial institutions directly finance actors in the chain other than the anchor firm, they may do so only occasionally and partially. Many of these financial intermediaries do not view the chain as a whole and still have a tendency to focus on each individual client and each transaction instead of applying the holistic approach of the value chain.

In this last respect, studies such as those by Dries and Swinnen (2004), Johnston, Meyer, and Curtis (2010), Swinnen and Maertens (2010), Swinnen, Maertens, and Vandeplass (2010), Beggs (2010), Lapavitsas (2006), and Staveren and Knorringa (2006), among others, show value chain governance, foreign direct investment (FDI), and social capital as important factors in determining the benefits and limitations of value chain finance mechanisms.

⁴ As cited in Milder (2008).

⁵ As cited in Peppelenbos (2010).

Value chain governance is essential in defining how well a finance provider within the value chain can screen and select clients and also how well it can monitor their activities and therefore how effectively it can enforce contracts. It is very probable that the governor of the value chain has better access to finance than the rest of the value chain agents. Thus, the governor would also have a kind of financial power, influencing the access to finance for other agents and segments (Helantera, 2003; Johnston, 2007; Miller & Jones, 2010).

Regarding the role of FDI on value chain finance, it is important to look at the presence of multinational enterprises (MNEs) under the figure of FDI in a value chain⁶. Dries and Swinnen (2004) suggest that FDI leads to improved financial access, increased investments, and quality improvements for local actors. In this last respect, Gorodnichenko (2007), Kohpaiboon (2008), the United Nations Conference on Trade and Development [UNCTAD] (2011), and Ranjan, Duab, and Goldar (2012) illustrate how foreign-owned firms may have efficiency and other “spillover” effects both on local competitors (horizontal spillovers) and on upstream and downstream domestic firms (vertical spillovers). These horizontal and vertical spillovers may take place through several channels. Local firms could have the possibility to imitate a new process or improve the quality of their products or services through observation of MNEs. Domestic enterprises could also find out about better processes or marketing strategies in the course of interaction with foreign competitors. Also, local firms could gain from the entry of new professional services or suppliers as a result of the presence of the foreign firms. In addition, foreign-owned firms may encourage domestic suppliers to improve quality or time efficiency by demanding higher standards.⁷

With regard to social capital⁸, Staveren and Knorringa (2006) refer to a variety of potential economic benefits to actors that are engaged in relevant social relations. The authors summarize these potential benefits in three groups: (1) reducing transaction costs, (2) enabling and reinforcing collective action, and (3) generating learning spin-offs. In the particular case of the credit market, Lapavitsas (2008) shows that market trust and information among credit participants have compelling social components that depend on economic function and social context. Therefore, financial institutions transform trust into a social and objective relationship.

One of the main manifestations of the presence and importance of social capital in value chains is provided by farmer associations. These organizations may mainly enable farmers to manage price risk and facilitate credit access. Farmer production is subject to various risks related with uncontrollable events (i.e. weather, diseases), institutional risks coming from policies and/or regulation changes, and financial risks associated with fluctuations in prices of inputs (including credit) and outputs. Individually, farmers are generally too small to cope with these risks. Therefore, their risk management needs to be handled collectively by an intermediary mechanism such as a farmer association. Efficient associations could perform price risk management and facilitate members’ financial access (UNCTAD, 2002).

In light of all the considerations above, the main goal of the present study is to analyze the role of value chain finance as an alternative to provide or expand financial access mainly to small, poor, and rural actors. As stated earlier, value chains by themselves would involve direct and indirect mechanisms of finance inside the chain that enable and facilitate access to finance for the chain’s actors. Finance is an important factor in determining the upgrading of the whole value chain and particularly in improving the situation of local actors from developing countries, who usually are small,

⁶ This fact is very likely in producer-driven chains, where producer governors are commanding vital technologies and playing the role of coordinating the various links in the value chain (Gereffi, 2001).

⁷ In the same studies mentioned, the authors conclude that positive vertical spillovers are more likely to occur than horizontal spillovers since foreign firms have incentives to enhance the productivity of their suppliers rather than that of their competitors.

⁸ Social capital could be defined as “the set of social relations that enable actors to gain, maintain or expand access to economic resources and that may lead to a reinforcement of the productivity of these economic resources” (Staveren & Knorringa, 2006, p.10).

poor, and rural agents. Additionally, it is important to notice that the analysis of finance at the level of value chains permits the identification of some special forms or practices of finance such as trade credit, contract farming, and informal finance that usually are not distinguished at the macroeconomic level.

Complementing our main goal, the intention is also to identify and analyze the task of certain factors such as value chain governance, foreign-owned value chain actors, and social capital, enabling some value chain financial mechanisms of financial access for poor actors in a value chain.

Given our main purposes, the first step was to review theoretical and empirical literature related to the topic. In this process we realized that the identification and analysis of the financial mechanisms involved in a value chain imply not only the knowledge and understanding of aspects related to global value chains and value chain finance. A variety of other aspects such as rural finance, farming finance, SMEs' financing, social capital, and foreign direct investment should be examined as well in order to get a more complete view of the situation. This fact certainly increased the complexity of the study, but at the same time it showed us how value chain finance can integrate diverse finance and non-finance aspects.

The second element of the present research is more empirical and is based on the analysis of a case study in Bolivia: the dairy chain in Cochabamba⁹. It deals mainly with the description of the main characteristics of our value chain case study and the posterior identification and analysis of the financial mechanisms that are currently accessible to the value chain actors of the dairy value chain in Cochabamba¹⁰. Additionally, complementing this qualitative analysis and on the basis of panel data analysis, we try to determine the effect of enabling or expanding access to credit (through a VCF mechanism) on the production of milk farmers. In the empirical work, both the qualitative and quantitative evidence is based on primary and secondary information data.

As it will be shown, in the dairy chain of Cochabamba, Bolivia, access to finance is a major problem for micro and small local actors, mainly milk farmers. This fact certainly affects their ability to improve their position and participation in a value chain, restraining their welfare opportunities. This reality becomes even more transcendental when we consider that around 70% of the Bolivian firms are micro and small-sized and that a significant percentage of them involve poor agents.

Regarding the dairy activity, the production of cow milk in Cochabamba, Bolivia is an important economic and social activity, due to the linkages with other sectors at the departmental and country level. In the entire department there are around 5,200 producers of raw milk, of which around 5,000 are located in the High, Central, and Low Valleys. Around 80% of all the milk farmers are in the category of micro and small-sized producers. Despite the fact that Cochabamba occupies second place in the production of raw milk at the national level, it currently exhibits the highest levels of milk productivity per cow. This new feature seems mainly explained by improvements in the production processes but also by the better quality of the cattle. Presently around 80% of the cattle are improved, predominantly the Holstein and New Jersey breeds.

Additionally, Cochabamba is home to one of the three industrial plants belonging to the largest dairy processor firm in Bolivia. At present, this large firm buys and processes around 250,000 liters of raw milk per day out of a total of 300,000 liters produced in Cochabamba. A remarkable fact is that before it was foreign-privatized in 1996, it was only buying around 120,000 liters of milk per day from milk farmers in Cochabamba, while this quantity has been doubled since 2010. Additionally, the

⁹ Bolivia is composed of nine departments, and the departments are divided into provinces. Cochabamba is one of the three most important departments in terms of population and economic activity.

¹⁰ In this respect, we should consider that a case study is more descriptive than causal and more exploratory than confirmatory.

multinational¹¹ that acquired what in the past was a state dairy enterprise is one of the most important industrial conglomerates of Latin America, with investments across the region not only in the food and agricultural sectors but also in building materials, paper, plastics, and other sectors (Servicio Nacional de Sanidad Agropecuaria e Inocuidad Alimentaria [SENASAG], 2012; Fitch Rating, 2012; Autoridad de Fiscalización y Control Social de Empresas [AEMP], 2011).

Finally, it is also important to mention that the market for dairy products in Bolivia still has much potential. In 1996, the per capita consumption of milk in the country was around 30 liters per year, while in 2010 this consumption trend had already increased to 42 liters of milk.¹² Therefore, if we consider that milk and in general dairy products are basic necessities and that the FAO recommends the consumption of at least 150 liters of milk per year, it is evident that there is an important gap to address in terms of demand.

The rest of this paper is organized as follows. Section 2 offers a review of theoretical and empirical literature related to the study. Section 3 presents some methodological and data considerations, and Section 4 presents a part of our empirical work summarizing some of the main characteristics of the dairy chain in Cochabamba, Bolivia. Building on the contextual base offered in Section 4, Section 5 deals with identifying the main value chain finance mechanisms presented in our value chain case study. Additionally, in this section we present the results of the panel data analysis executed to evaluate the effect of a value chain finance initiative on milk farmer production. Moreover, in this part we also classify some other particular aspects of finance in the dairy value chain in Cochabamba, Bolivia by segments. At the end, the main conclusions are presented.

4.2 Review of Related Literature

This section is a review of the existing theoretical and empirical literature related to our research topic. One of the main purposes of this review was to explore value chain finance issues, focusing on its role of improving access to finance. Additionally, this literature reassessment has been useful in determining the proper conceptual framework and methodological approach for our specific empirical case study. Moreover, it is also worthwhile for the reader in order to become familiar with the various aspects involved in the analysis of value chain finance mechanisms.

The identification and analysis of the financial mechanisms involved in a value chain entails not only theoretical and empirical issues about global value chains and value chain finance, but also a set of other related aspects. Therefore, this section begins by looking at the shortcomings of microfinance in reaching small firms and rural agents. Next, some main aspects of the global value chain approach are reviewed in order to build a theoretical basis on which to introduce value chain finance as an alternative to access finance. The specific roles of value chain governance, FDI, and social capital on value chain finance are also considered because they are important factors determining benefits and limitations of finance through value chains. Finally, we also look at the main characteristics in the financing of small and medium firms at the international level. This last issue is useful when comparing some international trends of small-sized business financing with the diverse actors that participate in the value chain case. Most local actors participating in the different segments of a global value chain are micro and small-sized; additionally, some are rural or are farmers.

¹¹ This main shareholder is Grupo Gloria, which is a Peruvian capital-based large conglomerate with subsidiaries in several Latin American countries, among which is PIL Andina in Bolivia. General Milk Company started in Peru in 1941 with a small milk factory known as Gloria, which later grew and was bought by Carnation/Nestle, but the ownership became Peruvian in 1986. Shortly afterwards the company obtained various food and agricultural industries, building materials companies, paper, plastics, and other businesses in Peru and other Latin American countries and became a real conglomerate.

¹² In the improvement of this figure, the lead also plays an important role by means of their publicity campaigns promoting the consumption of dairy products by referring to their important health benefits. For example, in 2005, the lead firm focused on a big campaign at the national level called "three glasses of milk." The idea was to show that by drinking at least three glasses of milk, children could have the chance to grow.

4.2.1 Microfinance, rural and agricultural (farm) finance

An important consideration concerning finance in developing countries is the revolution of microfinance¹³. This revolution implies a large-scale provision of small loans and deposit services to low-income people by secure, conveniently located, competing commercial financial institutions. In other words, microfinance refers to small-scale financial services supplied to people who farm or fish or herd, people who operate small and micro firms, and to other individuals and groups at the local levels of developing countries, both rural and urban (Robinson, 2001).

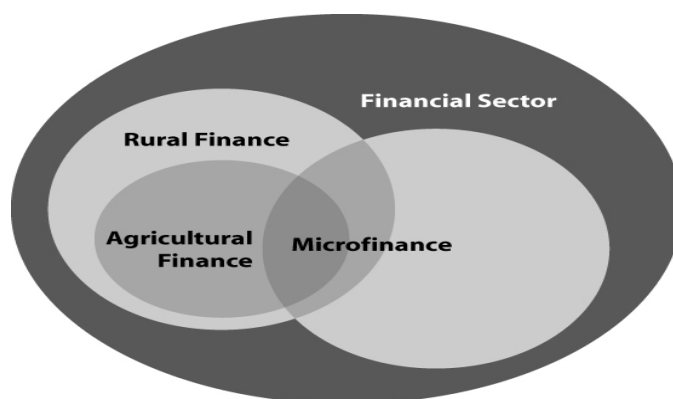
Appropriately designed financial products and services enable many poor people to expand and diversify their economic activities, increase their incomes, and improve their self-confidence. At the same time, MFIs can become profitable and self-sustaining – as is the case in Bolivia – while achieving wide client outreach. So in this scenario, governments and donors no longer need to provide ongoing credit subsidies, nor to cover the losses of state banks providing credit subsidies. This change in the emphasis of MFIs into sustainable financial institutions while maintaining greater outreach to the poor has given rise to a debate over a trade-off between outreach to the poor and financial sustainability¹⁴ (Robinson, 2001; Zerai & Rani, 2012).

Limitations of microfinance

Notwithstanding the apparent success of microfinance, it is likely that micro-lending is not necessarily the best option for small and medium enterprises, which would require loans that are too large to be handled by microfinance institutions (Inter-American Development Bank [IDB], 2005). Additionally, the interest rates associated with micro credit are many times much higher than the interest rates of traditional deposit institutions, which would imply high financial costs for micro and small-sized firms and in general for poor individuals.

There is a common statement in microfinance that the poor cannot pay for higher interest rates. Therefore, the financial sustainability goal would appear to clash with the social goal of serving large groups of poor borrowers. However, this trade-off is not accepted among some practitioners and academics, who argue that high interest rates help MFIs escape dependence on donor institutions and government funds. They also argue that some poor people live in distant and sparsely inhabited places where the administrative costs of lending are very high, and where interest rates would necessarily have to be high to cover those costs (Bengtsson & Pettersson, 2012; Zerai & Rani, 2012).

Figure 4.1. Microfinance and its relation to rural and agricultural finance



Source: Andrews (2006)

¹³ The concept of the revolution of microfinance was introduced by Maria Otero and Rhyne in 1993.

¹⁴ This debate is characterized by two different approaches, namely “the financial systems approach” and “the poverty lending approach.” The financial systems approach argues that commercial profitability is necessary in order for MFIs to generate the funding they need from financial markets to improve outreach. The poverty lending perspective stresses making subsidized credit available to the poorest of the poor (Robinson, 2001, as cited in Zerai & Rani, 2012; Bengtsson & Pettersson, 2012).

It must be recognized that the impact of microfinance has been very limited in terms of improving access to finance in rural areas and particularly regarding farming or agricultural activities. As illustrated in Figure 4.1, MFIs only cover the lower ends of both rural and agriculture finance. Microfinance reaches more than 1% of the total population in only a handful of developing countries, and the majority of those served by microfinance are from urban or peri-urban regions (Andrews, 2006).

The state of rural and farming finance

Rural areas and the agricultural sector in developing countries have often been underserved by traditional financial institutions (i.e. commercial banks) due to the higher transaction costs of these operations and the higher real and perceived risk associated with agricultural lending. With the purpose of promoting rural development, and in light of the relative importance of agriculture in many of these developing economies, in the past many governments have tried to expand rural and agricultural finance. During the 1970s and 1980s, the state provided credit either by means of state agricultural banks or through directed credit programs assisted by commercial financial institutions. While these programs may have had an immediate effect on the growth of rural areas and farming sectors, loans available under these programs typically were costly to administer and included subsidized interest rates. Further, for political or social reasons, governments often were treating these loans as grants, resulting in a culture of non-payment. As a consequence of these state-subsidized credits, any private sector activity that might have been taking place in the area was driven out. In the long term, governments could not carry on with these programs, and the agricultural sector and rural areas were left with even less access to credit (Miller, 2008).

The importance of rural and farming finance

Studies such as those by Andrew (2006), Harper (2005), Nagarajan and Meyer (2005), Miller (2008), and Hansel (2007) reflect a renewed interest in rural and farming finance. This is partly explained by the commitment to poverty reduction and the implicit recognition that the majority of the world's poor live in rural areas. In the particular case of Bolivia, around 67% of the population of rural areas lives under the poverty line (WB, 2012). Moreover, we have to consider that the farming sector remains the most important economic sector, especially for the rural poor, in many developing countries. Therefore, improved farming and rural finance would lead to greater economic growth and less poverty.

It is accepted that microfinance has reached relatively few people in the countryside, especially in Latin America and Africa. MFIs have tried to expand their services to rural areas, where poverty is concentrated and where most people are involved in agricultural and cattle activities. However, it is evident that many obstacles persist, such as high transaction costs, lack of information for credit assessment, high risks in agriculture, the need for long-term loans, inappropriate terms for loans and repayment, distortion from government-subsidized credit programs, and the exclusion of the poorest (Peppelenbos, 2010).

The place of the rural area and the farming sector in the microfinance sector in Bolivia

The Bolivian microfinance sector¹⁵, ranked second at the world level after Peru, is no exception. Although it is regarded as an extraordinary case of microfinance progressing quickly and soundly from a subsidized to a commercial base, it has certain limitations. Among them is its restricted reach into the rural area and the farming sector.

As we can see in Table 4.1, most of the loan portfolio of formal and semiformal MFIs in recent years has been concentrated in the urban area. In 2011, only around 33% of the loan portfolio was in the rural area. The situation of the farming sector is even worse since only around 6% of the loan portfolio

¹⁵ A more comprehensive and detailed report about the microfinance sector in Bolivia is presented in Chapter 2.

of all the financial systems is represented by this sector. From that 6%, 2% and 1% of the farming loan portfolio correspond to formal and semiformal MFIs¹⁶, respectively (ASOFIN, 2012; FINRURAL, 2012; INE, 2012).

Table 4.1. Bolivia: Microfinance loan portfolio, by area in % (2005-2011)

Description	2005	2006	2007	2008	2009	2010	2011
Total MFIs							
Urban	62.8	64.3	66.1	71.6	69.8	69.7	66.7
Rural	37.2	35.7	33.9	28.4	30.2	30.3	33.3
Semiformal MFIs							
Urban	42.2	46.0	50.3	61.6	61.2	60.8	55.9
Rural	57.8	54.0	49.7	38.4	38.8	39.2	44.1
Formal MFIs							
Urban	83.3	82.7	81.8	81.5	78.3	78.6	77.5
Rural	16.7	17.3	18.2	18.5	21.7	21.4	22.5

Source: Author's own preparation based on ASOFIN (2012) and INE (2012)

The need for alternatives that could enable and expand access for the rural and farm “poor” is evident. And it appears that a promising set of alternative financial mechanisms is available in the form of value chain finance. In the next section, some main features of the global value chain approach are presented. Based on this theoretical value chain framework, value chain finance is presented in the next sub-section (2.3).

4.2.2 Main aspects of global commodity chains

The concept

The Global Commodity Chain (GCC) approach – better known in recent years as Global Value Chain (GVC)¹⁷ – considers firms both as regionally localized and integrated in some way, either in terms of inter-firm integration or with a specific type of network. The GCC involves a diverse mix of producers, households, communities, and countries. Indeed, a commodity chain has been defined by Hopkins and Wallerstein¹⁸ (1986) as a network of labor and production processes of which the end result is a finished commodity. Gereffi and Korzeniewicz (1994) regard a GCC as sets of inter-organizational networks clustered around one commodity or product, linking households, enterprises, and states to each other within the world economy.

In a few words, a GCC is the sequence of activities required to make a product or supply a service. These activities are often carried out in different parts of the world, which explains the term global. Some activities add more value and are more profitable than others. Some actors that are participating in the chain have power over the others. These (global) powerful actors are considered the lead firms who aim to govern the chain. These leaders or governors enforce the terms under which the others in the chain operate. Value chain analysis shows that the relationships with these powerful global actors exert a major influence on upgrading and gaining opportunities for local enterprises or actors (Schmitz, 2005).

¹⁶ The formal MFIs are represented by microfinance commercial banks, private financial funds, and some credit unions, while the semiformal MFIs consist of NGOs denominated since 2008 as “Development Financial Institutions” (known by its acronym in Spanish, IFD).

¹⁷ The main difficulty with the term Global Commodity Chain (GCC) is that the concept of a commodity does not refer to the product itself but to the markets in which it is produced and sold. Then the same product could be a commodity in some situations, but not in others (Keane, 2008).

¹⁸ As cited in Gereffi & Korzeniewicz (1994).

The dimensions of GCC

As originally conceived by Gereffi (1992), global commodity chains have three main dimensions: an input-output structure, a geographical spread, and a form of governance.¹⁹ The input-output structure refers to the flow along the chain. This structure comprises a set of products and services (i.e. finance) linked together in a sequence of value-adding economic activities. The geographical dimension considers the dispersion or concentration of raw materials, production, export, and marketing networks. The last dimension refers to a governance structure of power and authority relationships that determines how financial, material, and human resources, as well as economic surplus, are allocated and flow within a chain (Appelbaum, 2004).

The governance dimension

Built on the concept of governance, Gereffi (1992) has distinguished between two types of global commodity chains. On the one hand are those controlled by buyers, and on the other hand are those controlled by producers. In the case of buyer-driven chains, the crucial governing role is played by a buyer at the apex of the chain. This type of chain is typical for labor-intensive industries such as footwear, clothing, furniture, and toys. The producer-driven chains describe a world where key producers in the chain, generally commanding vital technologies, play the role of coordinating the various links. Here producers take responsibility for assisting the efficiency of both their suppliers and their customers. Additionally, Gereffi has pointed out that producer-driven chains are more likely to be characterized by foreign direct investment (FDI) than are buyer-driven chains. He also argues that each of these two types of chains corresponds to a different production system (Kaplinsky & Morris, 2000). This difference between the production systems for each type of value chain is illustrated in Figure 4.2.

Figure 4.2. Comparison between producer-driven and buyer-driven value chains

	Producer-driven commodity chains	Buyer-driven commodity chains
Drivers of global commodity chains	Industrial capital	Commercial capital
Core competencies	Research & development, production	Design, marketing
Barriers to entry	Economies of scale	Economies of scope
Economic sectors	Consumer durables Intermediate goods Capital goods	Consumer non-durables
Typical industries	Automobiles, computers, aircrafts	Apparel, footwear, toys
Ownership of manufacturing firms	Transnational firms	Local firms, predominantly in developing countries
Main network links	Investment-based	Trade-based
Predominant network structure	Vertical	Horizontal

Source: Gereffi, 2001

Other approach to governance: Coordination

Regarding the governance dimension, it is also important to mention that in the last decade, in addition to the driving approaches explained above, other new approaches of governance such as coordination have emerged. In the coordination framework, forms of governance vary systematically according to the values (either high or low) of three independent variables: (1) the complexity of transactions, (2) the ability to codify transactions, and (3) the existing capacities of potential supply bases in relation to the requirements of the transaction. The matrix resulting from this configuration of two possible values for three variables gives rise to eight combinations, three of which are ruled out

¹⁹ Keane (2008) also refers to the institutional dimension as a fourth dimension of global commodity chains. Additionally, Keane (2008) observes that in the four dimensions established in the work of Gereffi (1994), there is an absence of indications as to how to measure dimensions.

in practice as inherently improbable. Therefore, we are left with five possible types of governance²⁰: market relations, modular, relational, captive, and hierarchical²¹.

Market relations governance takes place when transactions are easily codified, product specifications are simple, and suppliers have the capability to produce without much input from buyers. Modular value chains appear when the ability to codify specifications extends to complex products and when suppliers have the capacity to use generic manufacturing competences to supply full packages and modules, reducing the need for buyers to closely monitor and control design and production processes. Relational governance is present when product specifications cannot be easily codified, products are complex, and supplier capabilities are high; this leads to frequent communication between buyers and suppliers within the framework of a certain degree of mutual dependence, which may be regulated through reputation, social ties, and/or spatial proximity. In the case of captive value chains there is an ability to codify complex product specifications, but the capability of suppliers is low; this leads to a higher degree of monitoring and intervention by the buyer and to a transactional dependence by the supplier on the buyer. Finally, a hierarchical value chain arises when product specifications cannot be codified, products are complex, and competent suppliers are not available; as a result, the buyer has to develop design and production skills in-house (Gibbon, Bair & Ponte, 2008)²².

4.2.3 Finance and global value chains: The promising role of value chain finance in addressing access to finance

When the relationship between finance and value chains is considered, some authors such as Rabach and Kim (1994) have made reference to the financial services as part of the service sector, recognizing that services play a critical role in GCC because they not only provide geographic and transactional connections, but they also integrate and coordinate the atomized and globalized production process.

In general, poor and rural households face fewer opportunities, a fact which is reflected also in limited access to finance. Regarding this reality, value chains serve as a mechanism to address some limitations in accessing financial services. Their importance as an instrument to promote access to finance was demonstrated during the design process of the Central American Farming Policy for the region (Angulo, 2007).

What is value chain finance?

Value chain finance refers to the provision of financial services by actors within value chains (direct value chain finance) and the provision of financial services by financial intermediaries based on contractual relationships within the value chain (indirect value chain finance). The first form of value finance is relatively old and involves the providing of finance by input suppliers, traders, or processors to other members of the chain, such as when an input supplier provides credit to a farmer or when a lead enterprise makes early payments to a market intermediary. The actor who is supplying finance inside the chain could be using its own funds but also funds obtained from a formal financial institution based on its collateral. For its part, indirect value chain finance is new and could offer to chain actors the possibility to meet investment needs. The idea is that based on the contractual

²⁰ Ponte (2008) does not consider these five types as forms of governance but only as forms of coordination.

²¹ This coordination framework of analysis captures some important elements that determine the form of coordination between actors at different functional positions in a GVC, but it has only limited explanatory power to determine the overall form of governance. GVCs may be characterized by different forms of coordination in different segments. In the coffee value chain, for example, market relations characterize the link between retailers and roasters, captive relations characterize the link between roasters and international traders, and hierarchy (vertical integration) is often observed in the international trader–exporter link. Yet the overall value chain is clearly “buyer-driven,” and roasters are the lead firms in the functional division of labor along the chain. It is then necessary to distinguish “immediate” forms of coordination from the overall form of governance. But when overall forms of governance are examined, the original distinction between buyer-driven and producer-driven value chains remains a valuable historical category – one describing a historical process, rather than simply a typological device (Ponte, 2008).

²² For more details about these five types of governance in global value chains, see Gereffi et al. (2005).

relationships with other participants in the chains, actors (i.e. farmers) – who are usually regarded as very risky for financial intermediaries – can build their creditworthiness. An example is a bank issuing loans to farmers based on a contract with a trusted buyer or processor (Johnston, 2007; Wenner, 2010; Miller, 2011).

Direct value chain finance

Direct or internal value chain finance is the financing coming from inside the chain, and it is a practice that has been in existence for decades, or even centuries. It is the financing that processors or traders provide to farmers to ensure their own supply of inputs. It occurs when there are no other financing options, due to the absence of banks or micro-finance organizations offering appropriate products to meet farmer or small-sized agents' needs (Chalmers, 2006; Miller, 2011).

Financial direct mechanisms that are typically offered to small-sized agents through the value chain are trade credit, contract farming, and warehouse receipts. Trade credit involves short-term or seasonal loans between buyers and sellers of inputs or products. It is typically offered in value chains related to commodities. Relationships between buyers and sellers are often more temporary and more price-driven than in the case of contract farming or outgrower schemes. Contract farming-based loans are more tied to purchase agreements. Sellers are in a more formal or captive relationship with the buyer, who is often committed to providing additional services such as technical assistance. Warehouse receipts, issued to depositors of non-perishable commodities by safe and secure warehouses, permit financial institutions to use the deposit inventory for collateral.

Each of these products offers different types of benefits. For example, trade credit offers working capital to small-sized agents, allowing them to participate in promising value chains by expanding products sales, both through better yields and more secure market channels. Contract farming and outgrower schemes allow producers to gain access to high value markets, as well as to increase their productivity by offering them loans with embedded services. Nevertheless, none of these direct value chain financial instruments implies the provision of long-term loans needed for capital investment (Fries & Akin, 2004; Chalmers, 2006: seminar presentation²⁴).

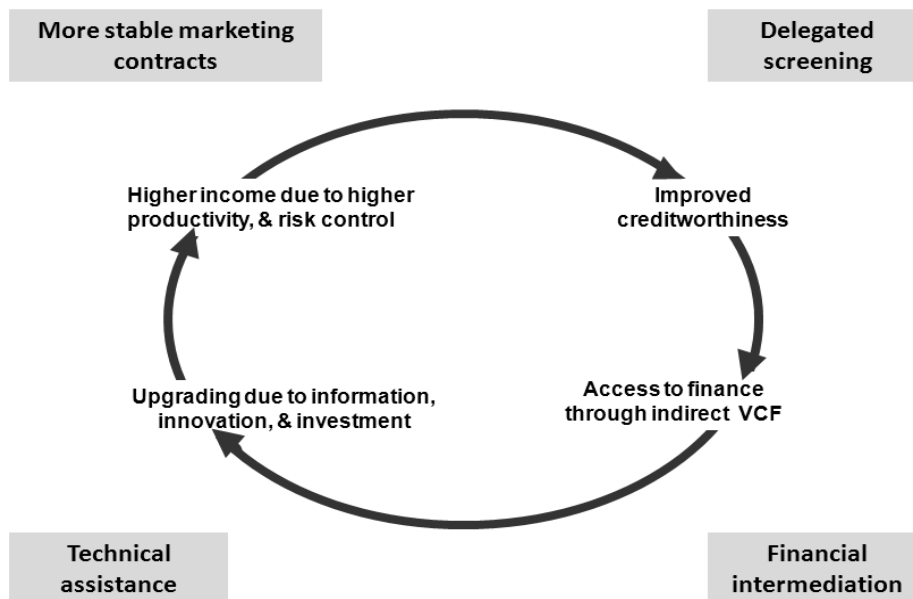
Indirect value chain finance: The virtuous circle

Indirect or external value chain financial mechanisms seem to offer more opportunities for investment needs. González-Vega (2006) views this type of value chain finance as the virtuous circle of external financing where producers can build their creditworthiness with financial intermediaries. This happens when their ensemble of market relations develops and grows stronger through participation in an organized value chain. When farmers receive technical assistance from buyers or when their buyers in some way guarantee purchase of the product, they improve their position for receiving loans from financial intermediaries. This means they can obtain or improve financing from outside the value chain. The existence of these contractual relationships, whether explicit or implicit, improves producer creditworthiness. They allow the financial intermediary indirectly to delegate part of the task of screening producers for credit risk to some other participants in the chain, thus bringing down costs and reducing risk (Quiros, 2011).

As we can see in Figure 4.3, spurred by their contractual relationships with other participants in the chain, farmers are more likely to invest, improve their technology, or seek out new buyers, and this in turn allows them to make a leap forward in productivity by adopting upgrades. If they have a standing source of technical assistance, they become more attractive to buyers, in turn improving their income and creditworthiness and ultimately increasing their access to financing. Farmers can enter the circle at any point and begin the circular movement of virtuous improvement, seizing the benefits of all these relationships.

²⁴ In Quiros, R. (ed.) (2007).

Figure 4.3. Virtuous circle of access to external finance for small producers



Source: Adaptation from Chalmers (2006), Seminar presentation²⁵.

The role of value chain finance in improving access to finance

Value chain finance can improve the overall effectiveness of those providing and requiring finance in the value chain. It means an alternative to expanding or financing for some chain actors (i.e. farmers). It can improve the quality and efficiency of financing value chains by a) identifying financing necessities to strengthen the chain, b) tailoring financial products to fit the demands of the chain actors c) reducing transaction costs by direct discount repayments and delivery of financial services, and d) using value chain linkages and knowledge of the chain to diminish risk for the chain and its actors (Miller, 2011).

Value chain finance is based not only on physical linkages but also mainly on knowledge integration. A crucial factor to success in finance is to “know the business.” Those who know the business best and in detail are those agents that are part of the value chain. Having and using that knowledge of the chain, they can understand the risks and work to diminish them much more easily than a financial intermediary who works with all types of businesses and clients (Miller & Da Silva, 2007).

Miller and Da Silva (2007) mention four reasons why value chain finance could increase access to finance. These explanations relate to: 1) increased funding coming from suppliers and agribusinesses directly involved in the chain; 2) increased creditworthiness, since participation in the chain can enhance the security of loan repayment for financial institutions; 3) reduced transaction costs for obtaining loans in cash or kind; and 4) decreased risk as a borrower due to secured markets and reduced income variability.

Limitations of value chain finance

However, it is important to recognize that value chain finance has several limitations. These restrictions are described by Begg (2010) as the following:

- Not adding to a system since it must work with the same “pot” of funding. When one party advances finance to another, they lose that cash flow and cannot invest it in their own business.

²⁵ Idem.

- Not providing investment finance, since credit is usually only for very short periods. This hinders growth, because parties can only expand by saving up capital to make large purchases or investments.
- Flowing finance in the “wrong direction” since in many cases, finance flows from small firms who are least in a position to supply it to larger firms who are in a stronger position. Small and poor actors provide large firms with delayed payment terms as requisites of doing business with them. Obviously, this can be a significant strain on their cash flow.
- Lacking transparency because in value chain finance it is not always clear what the true costs of finance are. As Pearce (2003)²⁶ pointed out, finance costs are usually bundled with inputs, transportation costs, technical assistance, and other services. This can make cost-benefit analysis difficult.

Dries and Swinnen (2004), Johnston et al. (2010), Swinnen and Maerten (2010), Swinnen et al. (2010), Beggs (2010), Lapavitsas (2006), and Staveren and Knorringa (2006), among other authors, illustrate how some factors would determine the benefits and limitations of value chain finance. Among these main factors are value chain governance, foreign direct investment (FDI), and social capital. In the next three sub-sections, these factors and their relationship with value chain finance are discussed.

4.2.3.1 Value chain governance and its role in access to finance

Helanterä (2003) shows that governors of the chain possess more access to capital than other agents and that their power in the chain would influence the access to credit for other agents and segments²⁷. Enhancing the access to finance for micro and small actors in the chain could give them the chance to take upgrading opportunities. Additionally, the broader financial access of the value chain governors could be a source of power to drive the chain.

In general, how value chains are governed seems important for several reasons, apart from financial access. Schmitz (2005) points to the facilitation of market access for developing country producers. Small producers or farmers from developing countries usually cannot access local and export markets. Lead firms are the ones that meet with these local agents and provide access to markets (including credit markets). Additionally, governance can also have a role in a local chain actor's capabilities. Producers who are linked to the lead firm often are on a steep learning curve. The lead firms are very demanding with regard to reducing costs and following certain quality and quantity characteristics. In order for farmers and producers to cope with these demands, lead firms would support them with technical assistance and other facilities (i.e. in-kind input credits). This combination of high pressure and strong support explains how patterns of local productivity could increase dramatically, leading to upgrading.

Following the coordination approach of governance, we could also regard the influence of the governors on financial access for other actors and segments of the chain as part of these coordination practices. As explained in Sub-section 4.2.1, this coordination could take different forms: market, balanced, directed, and hierarchical, with the modular and captive forms as two sub-categories of directed governance (Humphrey & Schmitz, 2002; Gereffi et al., 2005).

These different types of coordination along the chain have different effects on finance. A *market*-based value chain has little opportunity for a value chain lender to screen or monitor specific clients and little leverage for enforcing contracts. A *balanced* value chain has incentives for firms to cooperate by sharing information, jointly ensuring product targets are met, and respecting contracts that reflect interdependencies. A *directed* value chain provides the lead firm with more access to information,

²⁶ As cited in Begg (2010).

²⁷ It is highly probable that farms are in an unfavourable position in the value chains since they would not be able to use land as collateral, which constrains their access to capital.

control over supplier production, and power to enforce contracts. It is evident that balanced and directed value chain governance structures provide greater opportunities to increase lending within the value chain to achieve expansion or upgrading objectives (Johnston, 2007; Pietrobelli & Rabellotti, 2011).

The study by Johnston (2007) also reveals that in a directed value chain, buyers exert an important effect on the quality²⁹, quantity, and price of goods traded in the market, and sellers have limited bargaining power. Regardless of the unequal power structure, this type of value chain may be a win-win opportunity³⁰ for both buyer and seller. In contrast, we cannot find the same characteristic in value chains with balanced or market value chain coordination. In a balanced value chain, the chances to identify alternative buyers or sellers create more symmetrical power between buyers and sellers, giving incentives to negotiate certain shared standards related to quality, quantity, and price and still leaving some space to screen and monitor sellers and enforce contracts. However, in the case of market-based coordination, many buyers and sellers participate in independent transactions in which quantity, quality, and price are defined by the market and not by the firms; therefore, there will be very few incentives to generate ongoing relationships between buyers and sellers.

Upgrading, governance, and access to finance

Upgrading usually refers to the learning process through which businesses acquire new knowledge, often by means of relationships with other firms in the value chain or with firms in supporting markets. Firm owners then translate this knowledge into innovations that will lead to increased added value. In the ideal situation, upgrading is based on the ability of the firm to innovate and to ensure continuous improvement in products and processes. More recent theoretical and empirical literature looks further than the firm to the relationships between firms. It emphasizes systemic processes and inter-firm relationships within value chains and how they affect different types of upgrading. One of the core implications from this perspective is the importance that it places on the vertical relationships between micro and small enterprises (MSEs) and lead (governor) firms in the value chain, since lead firms can drive upgrading by creating good conditions that encourage MSE upgrading (Dunn, Sebstad, Batzdorff, & Parsons, 2006; Schmitz, 2005).

The current value chain literature also considers the influence of firm size on upgrading. When upgrading involves relatively high fixed costs, these costs are disproportionately higher for smaller firms, which may also be more capital-constrained than larger firms. Smaller firms also may be incapable of working at a level that allows enough economies of scale to profit from upgrading. To overcome some of these obstacles, MSEs can engage in joint action to coordinate their activities and create collective efficiencies. In making their upgrading decisions, MSEs consider a number of criteria, including enterprise profits, risks, sustainability, and household resource constraints. As individual MSEs do not place the same relative importance on these decision criteria, they may respond differently to the same upgrading opportunity. This interdependence of decisions among firms in the value chain and MSEs' upgrading decisions can be closely influenced by the actions of lead firms and whether lead firms provide information, technical assistance, *finance facilities*, and market inducements to encourage MSE upgrading.

Additionally, Dunn et al. (2006) look at four types of upgrading: process, product, functional, and channel upgrading. Process upgrading implies an increase in production efficiency that leads to either greater output from the same level of inputs or the same level of output from fewer inputs. Process upgrading reduces the cost of production and may be achieved by improved organization of the

²⁹ The demands about quality, quantity, and price can be the result of pressure to achieve international standards, or they can be facilitated by direct involvement of the value chain leaders when the suppliers' competence is low and the risk of failure to comply is high (Pietrobelli & Rabellotti, 2010).

³⁰ It is a win-win situation because given the demands of the buyer in terms of quality and quantity standards, the small supplier firms would improve in terms of productivity and quality. The buyer would also benefit from the supply of inputs that meet the required standards.

production process or by the use of an improved technology. Product upgrading consists of a qualitative improvement in the product, making it more desirable to consumers. Functional upgrading involves the entry of a firm into a new, higher value-added level in the value chain. This movement of the business closer to the final consumer requires the firm to take on new functions, and it positions the enterprise to receive a higher unit price for the product. Channel upgrading refers to the entry of a firm into a pathway leading to a new, higher value-added end market, such as a local, national, regional, and/or global end market. Firms may operate in one or more market channels at the same time.

Process and product upgrading often require long-term investments, for which MSEs must look for external financial sources. While most lead firms may provide working capital to their suppliers (MSEs), there are few lead firms that can offer long-term financing to them. Other existing sources of formal and informal finance for MSEs (banks and microfinance institutions; savings and credit associations; and loans from friends, relatives, and moneylenders) are mostly short-term working capital loans. The terms and conditions of these loans usually do not fit MSEs' upgrading investment needs. Lack of finance to upgrade is an unaddressed constraint for MSEs in many value chains (Dunn et al., 2006).

4.2.3.2 The role of foreign direct investment in access to value chain finance

Regarding another important aspect affecting value chain finance, it is likely that MNEs are part of value chains. This figure is typical in producer-driven value chains where producers are leading vital technologies and taking on the job of assisting the efficiency of both their suppliers and customers (Gereffi, 2001). Whether an MNE enters a foreign market by acquiring an existing local enterprise or by initiating a new business depends on organizational traits. FDI through acquisition represents a low-risk strategy for quick entry, while green-field characterizes a slower and riskier tactic. As a common strategy, MNEs have the tendency to operate in highly concentrated markets such as an oligopoly (Caves, 2007).

It is evident that a foreign subsidiary firm has major alternatives for internal and external financing in comparison to the local actors that are part of the chain. An asset or liquid expansion could be financed with retained earnings from its previous profits, new equity, loans from its parent, or borrowing from external sources (financial intermediaries and the security market). This relative ease in accessing finance is one more advantage of foreign-owned firms.³¹

Regarding the presence of foreign direct investment (FDI) in value chains, the work of Dries and Swinnen (2004) looks at previous studies that suggested that FDI has a negative effect on local actors of a value chain. However, Dries and Swinnen reach different conclusions, showing that FDI leads to improved access to finance, increased investments, and quality improvements for small local suppliers.

Vertical and horizontal spillovers

The mechanisms through which this happens are two: vertical and horizontal linkages. After FDI, processing companies start a process of vertical coordination through contracting with local suppliers in which input and output markets are interlinked. The contracting is associated with enhanced standards requirements for suppliers, while at the same time processing firms provide assistance programs to improve supplier management and to facilitate access to technology, credit, and other inputs. Together, the contracts and assistance programs are designed to overcome market imperfections. These contracts are enforced by interlinking the various markets. This process will lead to important vertical spillovers for the suppliers. Regarding horizontal connections, when domestic

³¹ The generation of new and advanced technologies takes place mainly in MNEs. Multinational enterprises play a major role in global innovation. MNEs represent around 50% of the world's total R&D expenditure and more than 65% of the world's business R&D (UNCTAD, 2011).

processing firms observe these successful MNEs' vertical integration strategies, they begin copying these tactics. In their research, Dries and Swinnen (2004) found that horizontal spillover effects are strong and rapid. For several of the effects, after 5 years there is no longer a significant difference between foreign-owned and domestic firms and their suppliers.

Regarding the possibility of vertical and horizontal spillover effects, more recent studies such as Gorodnichenko (2007), Kohpaiboon (2008), and Ranjan et al. (2012) suggest that it is more probable that FDI spillovers would take place through vertical linkages than by horizontal ones³². MNEs would have incentives to avoid information outflow to their local host competitors, reducing the chance of horizontal spillover taking place. On the contrary, MNEs would be encouraged to transfer knowledge to their local suppliers since such transfers would give advantages to MNEs in terms of improving input quality, lowering costs, and receiving inputs on time. There is also the possibility of spillovers from MNEs in upstream industries that may supply inputs that were not available in the local markets, make them technologically more advanced or less expensive, or guarantee that they are tied in with the provision of complementary services. In general, positive horizontal and vertical spillovers are more likely to occur in environments characterized by competition, rule of law, and openness to foreign investment and international trade (Sabirianova et al., 2005).³³

Food MNEs and their increasing global expansion

Another important fact narrowly related with FDI and value chains, and illustrated in the study of Swinnen et al. (2010), is that the globally increasing expansion of large food companies is taking place by means of foreign direct investments, and that small farmers from developing countries are integrating these high value chains. Large and often transnational companies work with surprisingly large numbers of small-sized suppliers. In some cases, small farmers represent the vast majority of the potential supply base, becoming the only choice for MNEs. Additionally, while processors may prefer to deal with large farms because of lower transaction costs for things like collection and administration, contract enforcement with big farms may be more problematic and hence costly. In some cases, dealing with small farms may even have important cost advantages. This is particularly the case in labor-intensive, high-maintenance production activities with relatively small economies of scale, such as dairy or vegetable production. Moreover, processors may prefer not to become too dependent on a few large suppliers.

On their side, small farmers also have strong motivations to establish business relationships with transnationals. High-value chains would offer higher prices and therefore profits on high-value production, and ultimately farm incomes would be larger. Guaranteed sales and prices as well as access to inputs and credit seem to be more important incentives, rather than the possibility of direct profit and income effects (Swinnen et al., 2010).

MNEs and financialization

Another key issue related to FDI and value chains is financialization. Serfati (2009), Milberg & Winkler (2010), and Milberg (2008) observe that transnational firms differ from others not only because of their size and their transnational activities. These authors suggest that MNEs could also be considered as "financial centers" with industrial activities. The globalization of production has had clear implications for pricing, profits, wages, and investment at the level of the firm, and these have supported the process of financialization. This practice has encouraged a restructuring of production, with firms narrowing their scope to core competencies. The increasing ability of firms to break up production vertically and internationally has allowed firms to keep cost markups and thus profit and

³² "Various factors have been considered to condition the effect of spillovers. For example, a popular hypothesis is that negative horizontal spillovers in developing countries are due to the low "absorptive capacity" of domestic firms. It is argued that the larger the technology and human capital gap between the domestic and foreign firms, the less likely the domestic firms are able to exploit the potential of spillovers" (Gorodnichenko, 2007, p. 5).

³³ As cited in Gorodnichenko (2007).

shareholder value, despite a scenario of slower economic growth. Firms reduced their expenditure on plants and equipment and, instead, expanded their spending aimed directly at immediately increasing shareholder value. While the profit share rose and investment as a share of profits stagnated or fell, firms sharply increased their dividend payments and purchases of financial assets.³⁴

The case of third world MNEs

However, we must consider the possibility that not all MNEs are involved in financialization exercises. This could be the case of third world MNEs that differ in some aspects from developed country MNEs. For example, third world MNEs possess proprietary assets well-suited to conditions in developing countries, and they have the incentive to avoid risks or the ability to deal with them in this setting. They are usually attracted to other and nearby developing countries, where they have a tendency to function at small scales in cooperation with local partners. They are also inclined to be little distinguished from local enterprises (Caves, 2007).

4.2.3.3 The roles of trust and social capital in access to finance

Trust is very important for accessing all markets, including financial markets. Trust is related to the duration of relationships and the degree of openness with which the chain partners exchange information. More trust between the business partners in the value chain can improve the conditions for good business performance. At the same time, when the chain partners share information on a regular basis, this will also contribute to helping formal financial institutions to understand the functioning of a particular value chain. Detailed knowledge of the value chain makes risks more manageable, so the financial intermediaries will be more willing to engage with the value chain and take the risk of lending to asset-poor farmers, traders, and other rural agents (Peppelenbos, 2010).

Much literature³⁵ on development economics has recognized social capital –defined as the quantity and quality of interpersonal relationships and trust – as an important development factor. A key potential role of social capital relates to its ability to diminish the inefficiencies produced by asymmetric information. Imperfect information is an inescapable characteristic of all economic relations, and as a consequence exchange is impeded, either because agents who could benefit from doing business cannot find each other or because once they find each other they do not trust each other sufficiently to carry out a transaction. Thus information sharing is an important channel through which social capital improves efficiency. Two other main channels usually identified in the literature are: 1) group identity and modification of preference and 2) explicit coordination and leadership³⁶ (Durlauf & Fafchamps, 2005).

Regarding social capital as a determinant of financial access, the literature is still scarce. One of the first studies that approach this important relationship is the one of Guiso, Sapienza, and Zingales (2000). In this work the authors analyzed various aspects of financial development in Italian provinces and found that households in high social capital areas are more likely to use checks, invest in stocks, have access to institutional credit, and use less informal credit.

There are various means by which social capital may have an impact on financial access, mainly credit access. Financial institutions may perceive potential clients that have wide networks to be more trustworthy, especially as those networks may overlap with the existing clientele of the institution. An

³⁴ Crotty (2005) points out that around 2,000 US non-financial corporations as a whole held more than half of their assets in the form of financial assets.

³⁵ Among this ample literature we can mention Coleman (1990), Putman et al. (1993), Fukuyama (1997), Woolcock (1998), Dasgupta & Serageldin (2000), and Grootaert & van Bastelaar (2002).

³⁶ Under the channel of group identity and preferences, we have various effects that arise because identification with a group or network (i.e. farmer association) affects individual preferences and choices. Agents could use groups as a “trick” to limit their future choices. For example, participation in Rotating Saving and Credit Associations (ROSCAs) could be understood as a way to force saving among their members. Regarding the coordination and leadership channel, it involves purposeful actions to improve the welfare of the groups. These deliberated actions are closely related with coordination and leadership (Durlauf & Fafchamps, 2005).

example of this would be for an existing member of a credit co-operative to recommend other members. From the aggregate perspective, we would expect that in circumstances where people generally trust each other more, the supply of financial intermediation credit would be improved. Guiso et al. (2000) consider that social connections across people are likely to develop this kind of interpersonal trust. On the contrary, in circumstances where interpersonal trust is very low, moral hazard problems related with banking may be too severe for any lending business to take place.

The role of farmer associations

One of the main manifestations of social capital in rural and farmer environments is the presence of farmer associations. These associations involve all types of groups composed uniquely or in part by farmers, or having farmers as their sole or main members³⁷. These organizations can take various forms. All farmers in a region can be members of an association, or the association can be formed on a voluntary basis. Use of the association for input procurement or product sales can be obligatory for its members, or it can provide just one of the alternatives. They can be specialized (i.e. a savings group created with the specific purpose of obtaining credits from formal institutions) or generic (i.e. a village association created to represent the local farmers in all kinds of different areas, from social to economic). Efficient associations³⁸ could use price risk management and facilitate members' access to finance (UNCTAD, 2002).

4.2.4 Some main characteristics in the financing of small and medium firms

Empirical literature also suggests that small and medium firms are financially more constrained than large firms and are less likely to have access to formal finance. Although SMEs represent a significant share of the total employment in many countries, their contribution to economic growth may be restricted since they confront greater growth barriers such as limited financial access (Beck & Demirgüç-Kunt, 2006).

Besides the reality of SMEs facing less access to formal external finance, there are various other aspects related to the financing of SMEs. Some main examples of these finance issues are reviewed in the following sub-sections.

4.2.4.1 The determinants of financial obstacles for small and medium firms: International trends

Considering that access to finance is an important growth constraint for SMEs, various studies such as Beck (2007), Beck and Demirgüç-Kunt (2006a), Beck, Demirgüç-Kunt, Laeven, and Levine (2003), Beck, Demirgüç-Kunt, and Maksimovic (2008a) and Beck, Demirgüç-Kunt, and Martinez (2009) have attempted to identify the determinants of financing obstacles. Based on the analysis of ample data sets, most of these studies found that age, size, and ownership are the main firm characteristics best predicting financing obstacles. Older, larger, and foreign-owned firms report less financing constrains.

The studies also look at the effect of country characteristics on the firms' financing obstacles. The findings show that countries with higher levels of financial intermediation development, more liquid stock markets, more efficient legal systems, and higher GDP per capita report lower financing obstacles. The most significant country aspect explaining cross country variation in firms financing

³⁷ The importance of this type of organization has been recognized for a long time. For example, in a 1975 World Bank report it was stated that, "Group arrangements such as cooperatives provide an organized basis for handling many of the problems of providing access to services for large numbers of rural people. They allow a measure of involvement through participation, but also provide a vehicle for collective negotiation of credit, input supplies and delivery of marketable surpluses" (UNCTAD, 2002).

³⁸ If a farmer association is to be effective, the freedom to join or to quit is essential – farmers should feel the association belongs to them, rather than being imposed on them by the government or a foreign aid donor. A second essential condition is that the association is truly democratic, with all members having the same rights and collectively electing their representatives. In the past, the record of farmers' associations has been very bad, precisely because these conditions were not met (UNCTAD, 2002).

constraints appears to be overall institutional development (Beck & Demirgüç-Kunt, 2006a and Beck et al., 2008a).

4.2.4.2 Access to finance and firm innovation

Knowing about the importance of technological innovations for economic growth, it is important to examine the role of financial development in fostering innovation and thus increasing efficiency. Based on empirical evidence, Ayyagari, Demirgüç-Kunt, and Maksimovic (2007b) found that financial access is fundamental for firm innovation⁴⁰. The bigger the share of investment a firm finances externally, the more innovative it is. The analysis is based on enterprise surveys of over 19,000 firms across 47 developing countries. Additionally, the results of the research suggest that *“more innovative firms are large exporting firms characterized by private ownership, highly educated managers with mid-level managerial experience, and access to external finance. By contrast, firms that innovate less are typically state-owned firms without foreign competitors”* (p. 1). In addition, financing coming from foreign banks seems more correlated with higher levels of innovation in comparison with finance from domestic banks.

Given the importance that external finance has in terms of firm innovation, other studies such as Beck et al. (2008a) attempted to find out which part of firm investment is financed externally. The work of Beck et al. (2008a) establishes that an average of 40% of firm investment is externally financed⁴¹. Small firms finance an even lower proportion of their investment externally (around 20%), particularly because they make use of bank finance to a lesser extent.

If only around 20% of the investment of small firms is externally financed, it is highly probable that the rest of the investment is self-finance.

However, the main disadvantage of self-finance is that a household's or enterprise's resources may not match those required to harness an investment opportunity within a reasonable time frame. Thus, a household or an enterprise may not be able to take advantage of a high-productivity investment opportunity. The scale of an economic activity or an enterprise will have to be limited by the amount of self-finance. (...) A poor household may require funds to buy cattle, a sewing machine, or a bag of fertilizer. The amount of funds required may be largely relative to the income of a household living at subsistence level. (...) Self-finance limits specialization, adoption of better technology, growth in productivity, and thus economic growth and development.” (Nimal, 2007, p. 9).

4.2.4.3 The role of trade credit

An important mechanism of value chain finance and firm financing in general is trade credit. In fact, credit extended by a seller who allows delayed payment for his products represents a substantial portion of corporate liabilities, especially for medium and small firms. Since asymmetric information between banks and firms can constrain finance, trade credit could alleviate this problem by incorporating in the lending relationship the private information held by suppliers about their customers (Biais & Gollier, 1997).

A central question about trade credit is whether it is a complement or substitute for financial credit. Looking for answers, Demirgüç-Kunt and Maksimovic (2001) argue that non-financial firms offer trade credit because they may have a comparative advantage in using informal mechanisms to make sure

⁴⁰ The authors define innovation broadly, to include not only core innovation activities (introducing new technology and new product lines and upgrading them), but also other types of activities that promote knowledge transfers (such as signing joint ventures with foreign partners and obtaining new licensing agreements), as well as opening or closing plants, discontinuing product lines, and activity sourcing decisions, which reflect the overall dynamism of firms (Ayyagari et al., 2007b).

⁴¹ Dividing external financing into its parts, about 19% of all financing comes from commercial banks and 3% from development banks. Another 7% is provided by suppliers and 6% through equity investment. Leasing is another 3%, and less than 2% comes from informal sources. More recent firm survey data for an expanded sample of countries and firms suggests similar patterns (Demirgüç-Kunt, 2010a).

that borrowers repay. However, in order to optimally exploit this advantage in providing trade credit, firms should get external financing from financial intermediaries and markets. Therefore, trade credit would be complementary with the development of the financial system.

Considering that trade credit is a significant source of finance for small firms, understanding determinants of trade credit and how it is related with the development of the financial system and legal system also has important policy implications for the design of small and medium enterprises' (SME) financing programs. In the past, development institutions frequently focused on helping local financial intermediaries to provide financing to SMEs by means of directed credit programs. However, in most of the cases these programs were a failure since borrowers did not pay back the loans and did not improve their economic situation either⁴⁶ (Demirgüç-Kunt & Maksimovic, 2001).

4.3 Methodology and Data

The present study has two main research components. The first part is a reassessment of the existing literature related to the research topic. The main purpose of this review was to explore value chain finance and related issues in order to establish an adequate conceptual and contextual framework to analyze the particular case of the dairy value chain in Cochabamba, Bolivia.

A main conclusion of this review is that access to finance is crucial for the functioning of global commodity chains, for determining the upgrading of the whole chain, and particularly for improving the situation of local actors from developing countries (usually small producers). We have also seen that value chain finance implies direct and indirect financial mechanisms along the chain that enable and facilitate access to finance for the actors in the different segments of the chain. Furthermore, considering that small-sized businesses participating in a value chain are the most financially constrained, we have also reviewed some international patterns considering the finance of small and medium firms.

The second element of the present research is original empirical work based on a case study analysis. One of the main strengths of this methodological approach is that it allows for an in-depth examination of an event or case. In the present work, our case study is the dairy value chain in Cochabamba, Bolivia.

Given some typical features of a case study in terms of descriptive inference and explorative research strategy, our empirical work starts by describing the main characteristics of the dairy chain in Cochabamba. Then comes the identification and analysis of the direct and indirect financial value chain mechanisms that are available for the chain actors of this value chain case. Moreover, it would be relevant to consider the influence of certain factors on accessing value chain financial mechanisms, such as governance, social capital, and foreign ownership.

A case study in general and particularly one involving a value chain case implies having quite detailed data (since a value chain involves various different segments and actors). It was thus necessary to collect both secondary and primary information related to our study case. Primary data collection demanded the execution of field research in 2005. This primary information collected in 2005 has been complemented in 2012 through various conversations with key actors involved or related with our case value chain. Additionally, by means of these in-depth interviews with head officers of milk farmer associations, the main dairy processor, and professionals specializing in dairy product processes, we could add validity and update what was collected in the field work. This has been a difficult task given the geographical dispersion of the actors involved in the dairy chain of Cochabamba, plus the fact that in the segment of milk farmers and trading there are many and

⁴⁶ Many times the use of funds was changed and there was not even the intention to repay these loans, since they were seen as a kind of "gift."

different types of actors. Additionally, there was a reluctance to provide information, making the collection of information difficult and time-consuming.

Once the categories, variables, and indicators related to the study case were identified and operationalized, the collection of primary information was carried out by means of questionnaires, in-depth interviews, and also workshops (in the case of the milk farmers) involving different actors of the dairy chain in Cochabamba, Bolivia. Given the dispersion and quantity of dairy chain actors, the samples for the different segment actors were composed of cases studies. For all the value chain actors, except the consumers, as part of the samples we considered micro, small, medium, and large-sized firms from diverse geographical locations. This has the purpose of guaranteeing a certain level of representativeness in the respective samples for every chain segment. The workshops that were carried out with the participation of milk farmers had the purpose of verifying, complementing, and adjusting the information already collected through questionnaires and interviews.

Based on the qualitative analysis of this primary data as well as available secondary information, we have identified some main characteristics of the dairy chain in Cochabamba. In addition, since our object of study is not the dairy chain itself but the particular issue of value chain finance, we explore aspects of finance in every segment of the dairy chain in Cochabamba. In this analysis of finance along the study case value chain, we have focused on the large processing firm and its linkages with the actors of other segments. The main reason for this is that the large processor buys around 80% of all the raw milk that is produced in Cochabamba, and the dairy products produced by the big firm represent about 85% of the dairy trading in that department and in the whole country. So, by studying the financial mechanisms involving the big processor and its linkages with other chain actors, we are covering most of the value chain financial instruments that are present in our value chain case. Moreover, this foreign-owned enterprise is the driving force of the dairy value chain in Cochabamba.

Additionally, as part of our original empirical work and complementing our qualitative analysis, we have also executed some panel data analysis. The main goal for proceeding with this type of analysis was to evaluate the role that a particular value chain finance mechanism has in the production patterns of milk farmers. This specific value chain financial instrument is a credit facility that has been introduced by the large dairy processor and has been directed only to milk farmers who supply raw milk to the large processor. This credit option has been available since 2000, after the largest dairy processor was acquired in 1996 by one of the largest food conglomerates of South America.

This financial access facility functions in coordination with the milk farmer associations that act as a type of intermediary between the formal financial institutions and the farmers. The credits in kind and in cash offered by the association to their members are granted by formal financial intermediaries and accomplished with the guarantee of the large processor (supported by the contractual relationship with the producers and the agreements that the large firm has with the associations). The lead firm also plays the role of “retention agent,” discounting methodically the equivalent of the credits and other services that the producer acquires from the association. Therefore, the risk that the producer prioritizes other uses with the income of milk sales or engages in other “hidden actions” (moral hazard) is practically zero. Perhaps this is the main reason why the financial intermediaries do not establish a direct relationship with the producer; the transaction costs and risks for the financial institutions with regard to the return of credits are likely much less if the associations intermediate between the financial institution and the milk farmer.

Therefore, we consider it important to evaluate the impact of the use of this credit access facility – enabled by the large processor – on milk farmer activities. With this purpose and since our primary data is mostly qualitative, we have collected secondary data about farmers for three different years: 1998, 2002, and 2012. Our data sources are the biweekly payment lists of the associations that register numbers on delivered milk production (in liters), fat milk content, price, and association

discounts for every farmer member. When these associations' discounts are higher than a certain amount, they are the main signal that the farmer has received a credit in the past weeks or months. So on the basis of this information we have built a dummy variable referring to the use or non-use of these association credits. Additionally, in these bi-weekly sheets there is also information about which members are shareholders of the large firm. Although the share of all the raw milk farmers of Cochabamba is only about 5% of the total equity, there is the possibility that farmers who are shareholders of this enterprise are encouraged to produce more milk or to improve its quality, given the fact that the firm pays them a higher price per liter of milk.

Referring to the sample and considering that access to this information is very restricted, we had access to only one bi-weekly sheet per year. Given such a restriction the best that we could do was to select the same bi-weekly month for every year. Additionally, we focused on the most representative dairy farmer association. This chosen association is the oldest and represents around 1,500 members. From this total number of members we have selected from the bi-weekly sheets 979 cases. The criterion for the selection of the cases was the existence of at least two observations across time (which would imply a selection bias), so that we can evaluate the variation of milk production as a function of some variables such as the use of a credit facility, which is our main research interest.

Since credit access and the use of credit are aspects that have varied over time and there is the necessity to evaluate the effects of this variation on farmer's milk production, we considered panel data analysis as the most suitable technique for this purpose. For this econometric technique, we considered two procedures: the fixed effects (FE) and the random effects models (RE).

The equations to be estimated by FE (1) and RE (2) panel data procedures are the following:

$$Y_{it} = \beta_1(CREDIT)_{it} + \beta_2 X_{it} + \alpha_i + u_{it} \quad (1)$$

$$Y_{it} = \beta_1(CREDIT)_{it} + \beta_2 X_{it} + \alpha + u_i + \varepsilon_{it} \quad (2)$$

In both equations Y_{it} is the dependent variable, where i = entity and t = time; this represents the production of milk of every farmer measured in terms of quantity and quality for the years 1998, 2002, and 2012. CREDIT is a dummy proxy of access to credit. X_{it} corresponds to a set of variables that also influences farmers' milk production apart from credit access. In this group of control variables, we have the price that the large firm pays per liter of raw milk and the situation of the farmer in terms of their equity participation in the big firm. This last variable is measured by a dummy that takes the value of 1 if the farmer is a shareholder of the enterprise and 0 if it is not. Although it would be desirable to have more variables, we are restricted to the data that is available in the bi-weekly sheets. β_1 and β_2 are the coefficients for the CREDIT and the control variables. In the FE equation (1), α_i is the unknown intercept for each entity (n entity-specific intercepts) and u_{it} is the error term, while in the RE equation (2) α is the population unknown intercept, u_i is the between-entity error, and ε_{it} is within-entity error.

4.4 Main characteristics of the dairy value chain in Cochabamba, Bolivia

The start of the dairy industry at the regional and national level took place in the 1960s, when the Bolivian government, with the financial support of UNICEF, founded the first dairy processing plant in Cochabamba. Complementary with the establishment of this plant and others in various departments of the country, the government also introduced a national dairy promotion plan (Plan Nacional de Fomento Lechero) proposed and managed by a state promotion council. This state office functioned until 1985, giving some incentives to the dairy sector in general by introducing pedigree cows, machinery, and equipment and training and giving certain credit facilities to milk farmers through state-owned banks. In the scenario of the Structural Adjustment Programs applied since August of 1985, the economic model based on state capitalism was replaced by a liberal one. Therefore, the

state banks disappeared and the government-owned ones were closed or privatized. In the case of dairy processing plants, first they were transferred to regional development councils and after they were privatized. In the case of the three largest – located in Cochabamba, La Paz, and Santa Cruz – they were acquired by a Peruvian multinational enterprise.

The milk farmer segment

A recent report by SENASAG (2012) shows that Cochabamba is the second most important department in the production of raw milk in Bolivia. Santa Cruz is the top producer of raw milk in the country with around 180 million liters per year. Next is Cochabamba with around 70 million liters per year. La Paz occupies the third position with 17 million liters. The other six departments of Bolivia are on the list with amounts that are not significant at the national level. Additionally, the study shows that Cochabamba exhibits the highest milk productivity per cow at the national level.⁴⁷ This is quite remarkable since Cochabamba only has around 22% of the number of milk cows that are in Santa Cruz and it does not have the same favorable conditions regarding the provision of certain inputs that are necessary for the dairy farmer activity. For example, most of the cattle food at the national level is produced in Santa Cruz, since the weather and extensive lands are very propitious for the growing of certain cereals (i.e. soya, cottonseed) that are very important in cattle feeding (Ministerio de Asuntos Campesinos y Agropecuarios [MACA], 2005).

With respect to this last point, it is important to note that most of the milk farmers in Cochabamba have increased their production levels since 1998. In fact, if we compare the registers on the production of raw milk that farmers delivered to the large processing firm in the years 1998, 2002, and 2012, it is evident that the majority have increased their production amounts. In some cases, we can observe that some farmers delivered even 50 times more liters in 2012 in comparison with the amounts delivered in 1998.

Related with this important change, it seems that the role of the large firm in the value chain has exerted a positive effect in terms of the productivity patterns of milk farmers. It is clear that the presence of foreign direct investment in the large firm (since 1996) has not only implied a change in terms of the ownership of the biggest processing enterprise but more importantly in terms of a new environment for the relationships between the large firm and the rest of the value chain actors (mainly milk farmers and traders).

It is likely that the increased productivity of the milk farmers is caused by the new requirements and conditions of quality, quantity, and price imposed by the large processing enterprise. These new demands led to the exit of some milk farmers since they could not cope with this new environment. The standards established by the large processor were accompanied by certain important facilities such as technical assistance, capacitation, and in-kind input credits, and certain credit facilities such as a guarantee extended by the big firm. This collateral made it possible for financial institutions to consider the milk farmers as reliable. The credit letter that the big firm issues in favor of the milk farmer is extended in the name of the farmer associations. Therefore, farmer associations are the ones who receive the credit and intermediate between the financial institution and the milk farmer.

The situation mentioned above suggests the existence of vertical downstream positive spillovers generated by the foreign-owned processing firm. This fact is consistent with recent literature about FDI spillovers (i.e. Gorodnichenko, 2007; Kohpaiboon, 2008; UNCTAD, 2011; Ranjan et al., 2012) and global value chains (Swinnen et al., 2010). The MNE would be encouraged to transfer knowledge and provide other facilities such as access to credit to its local suppliers of raw milk for its own benefit. This benefit is mainly reflected in terms of a reliable provision of raw milk, better quality, and cheaper

⁴⁷If Santa Cruz occupies first place in raw milk production, it is not specifically because farmers are more efficient than in Cochabamba or La Paz. Santa Cruz has environmental conditions that are very favorable for cattle (i.e. weather, food, extensive lands) and a higher number of cows compared with those in Cochabamba.

costs. Dairy farmers also seem to have strong motivations to supply milk to the large foreign-owned processor. Some of the main reasons seem to be: guaranteed sales and prices, access to inputs, credit, and other facilities (i.e. technical assistance and training).

The milk farmer segment in the department of Cochabamba is composed of around 5,200 milk farmer families, of which around 5,000 are located in the High, Central, and Low Valleys. The rest are located in the tropical region, where dairy activity is relatively new and characterized by very low productivity. From the total of milk farmers, around 80% can be considered as micro and small-sized. Considering that the total number of milk farmers in the country is around 9,000, it is evident that many are from Cochabamba. Additionally, most of these farmers live in poverty situations (SENASAG, 2012; Fitch Rating, 2011).

The raw milk produced in both the valleys and the tropical regions is delivered to the processor firms in percentages of 87 and 91, respectively. From the total of raw milk produced in the department, around 80% of it is sold to the large processor, and the dairy products produced by this large firm represent around 85% of all the dairy products traded in Cochabamba and also in the whole country. Therefore, this foreign-owned processor appears to have the control and be the driving force of the chain.

Dairy activity is not one of the most lucrative activities for the farmers in Cochabamba; however, it is one of few activities that offer certain stability. This stability is closely related with the contractual relationship with the large firm, which assures the sale and price of the raw milk, independently of the possible fluctuations in the market.

An important feature of the milk farmer segment is the existence of the associations. These associations represent raw milk producers and provide a range of services and inputs to their associates. As we will see, these organizations – as a main manifestation of social capital – play an important role in value chain finance. The six existent milk farmer associations in Cochabamba represent about 78% of all the raw milk producers in the department, and in terms of production they account for around 76% of the total raw milk produced in the region (Feddes, 2004).

The processor segment

In the processor segment, besides the foreign-owned processor there are eight more industrial processors in Cochabamba. However, only the foreign firm can be regarded as large, another as medium, and the rest are small-sized firms. It is evident that there is an important gap between the large firm and the rest of the processing firms. This gap is reflected not only in terms of production capacity but also in terms of the variety and quality of processed dairy products.

Of a total of around 300,000 liters of raw milk per day produced in Cochabamba, at least around 250,000 liters are processed by the large firm⁴⁸. The medium firm processes around 22,000 liters, and the rest is processed by the small firms. Additional to the presence of the industrial processor, we have to mention the existence of non-industrial processors who produce cheese and yogurt by artisanal methods and in small amounts. This artisanal production is carried out on a much more reduced scale and usually only implies family work, so these processors can be regarded as micro-sized. Additionally, frequently the production of these artisanal processed dairy products is neither stable nor continuous. It depends strongly on the quantity of raw milk that they sell to the processors.

In the case of processors (particularly the large enterprise) that are demanding in terms of the fulfillment of certain quality standards in the raw milk, there is always the probability that the raw milk can be rejected. A good option for milk farmers in this case is to process this rejected milk (mainly into fresh cheese). In other cases, the possibility to process a certain part of the production of raw milk is

⁴⁸ Based on interviews with a farmer milk association officer, it seems that this amount has already increased in 2012 to 280,000 liters of raw milk per day that the large firm buys from the milk farmers in Cochabamba.

seen as a good opportunity to increase income through adding value to the raw milk. However, this is not always a good option since there is the risk that the product will not be sold or that the price could be lower than expected.

The large plant was created in 1960 by a national government council with financing coming from the international cooperation. At that time it had the capacity to process 40,000 liters of milk, while in 2012 the installed processing capacity was for 1 million liters per day in its three plants located in Santa Cruz, Cochabamba, and La Paz. The processing plant of Cochabamba has an installed capacity of around 300,000 liters, and in August 2012 there was evidence that it was processing at least 250,000 liters per day. The plant of Cochabamba was one of the first dairy plants in Bolivia to be foreign privatized in 1996. In that year the Peruvian multinational Gloria S.A. acquired the industrial plants of PIL from La Paz and Cochabamba, and after 3 years it also bought the PIL plant in Santa Cruz. In 2004, the transnational consortium merged their three firms and together formed PIL Andina S.A., which currently is the national leader in the industrialization of dairy products. In terms of the national market, this large processor covers around 85% of the entire Bolivian dairy market, with around 270 different products that are produced in the three plants. This includes powdered milk, which aside from having significant demand at the national level is also exported to Peru, Venezuela, and Ecuador. Not all the plants produce the full variety of products; the plant in Cochabamba produces around 190 different dairy products, the one in Santa Cruz 120, and the one established in La Paz only 33.

An important characteristic of this large firm in these last years has been its constant growth and technological innovation. Those benefiting most from this have been the consumers, who can currently enjoy a significant variety of dairy products that are very competitive with imported ones in terms of quality and price. That is not a coincidence if we take into account that Gloria S.A. is one of the leading Latin American dairy companies, having investments in Bolivia, Argentina, Ecuador, Colombia, and Puerto Rico (Class & Asociados S.A., 2012 & 2013).

This Peruvian conglomerate began operations in Arequipa in 1941 as a company of the Carnation group from the United States. In 1985 after Nestle took over Carnation worldwide, Gloria became an independent company with Peruvian capital. Today Gloria is one of the largest conglomerates in the region, and it has ownership of firms in the areas of food, cement, paper, paperboard and packaging, and agribusiness in Peru and also other Latin American countries. In the dairy sector one of the most well-known and representative products is the canned evaporated milk that is exported to more than 45 countries around the world in the Caribbean, South America, Africa, and the Middle East. In 2011, Gloria S.A. bought 47% of the shares of SOBOCE, the most important cement enterprise of Bolivia. In fact, SOBOCE (Sociedad Boliviana de Cemento) represents around 50% of the cement market in Bolivia. The other 50% corresponds to two other local firms (Class & Asociados S.A., 2012).

Gloria S.A. seems to follow predominant multinationals' strategies across the world, as reported in Caves (2007). First, FDI initiatives of this MNE take place in highly concentrated markets. Second, the foreign conglomerate follows an acquisition strategy in order to minimize risks. Additionally, considering that Gloria S.A. is a third world MNE, there is evidence that it is attracted to investing in other and nearby developing countries. However, contrary to the international trends reviewed by Caves (2007), this Peruvian MNE does not tend to operate on small scales and tends to be quite different from local firms.

Regarding the case of the medium-sized dairy plant, it is established as a cooperative. The plant was founded by the Integral Cooperative of Services in Cochabamba, with the financial support of the Inter-American Development Bank. The main goal was to contribute to resolving the malnutrition and poor health condition of the population of the high valley of Cochabamba. Another target was also to encourage the productivity of micro and small farmers in the mentioned region. In these terms, this cooperative is not only involved in the production of dairy products but also provides credits (in kind

and cash) and technical assistance to its members (who are the same raw milk producers). Recently, in 2009, the firm received an important injection of capital coming as a grant from the Japanese government. This new capital has mainly been invested in new equipment with an installed capacity of 100,000 milk liters per day. The challenge was to increase the milk processing capacity from 12,500 to at least 20,000 liters per year since 2010. One of the latest reports about dairy processing firms in Bolivia shows that this medium-sized dairy enterprise established in Cochabamba was processing about 22,000 milk liters per day during 2011. This increase in the production of this dairy cooperative is remarkable, but compared to the utilized capacity of the large firm (250,000 liters per day) it is still very low. Around 7% of the total raw milk produced in Cochabamba is processed by this medium-sized dairy firm compared to the 83% share of the big processor. This significant difference only verifies the lead position of the large firm in the dairy sector of Cochabamba and Bolivia (SENASAG, 2012; AEMEP, 2012).

The medium-sized processor also carries out some quality controls on the raw milk that farmers provide. However, these controls are less strict than the ones executed by the large enterprise. The large firm has an exclusive department and laboratory that among other tasks exercises strict control over certain quality standards of the milk (i.e. fat percentage, purity, microbiology tests). The same milk farmers recognize that the medium-sized processor almost never rejects their milk and that the quality standards are less strict. However, it is very remarkable that despite these more lenient demands, milk farmers prefer to sell to the big firm and not to the medium and other small processors. It is evident that there are strong incentives for milk farmers to make and keep relationships with the foreign large firm. This fact is coherent with the trends of food MNEs at the world level. As Swinnen et al. (2010) highlights, not only are MNEs motivated to deal with small farmers but also small local farmers are encouraged to integrate themselves into these high value chains. The main reason is not necessarily the possibility that the foreign company could pay a higher price. Guaranteed sales and prices, access to inputs, credit facilities, training, and technical assistance are often stronger motivators.

Generally, the industrial plants are located near the regions where raw milk is produced. For example, the large firm is located in the Low Valley, from where it collects more than 50% of the milk produced in that valley. However, additionally it collects raw milk from the Central and High Valleys. The raw milk produced in the tropical region of Cochabamba is bought by the Santa Cruz plant of the same lead firm. In the case of the medium-sized processor, all the processed milk is collected in the High Valley where the firm is located.

The rest of the processors are quite small, and their dairy production is insignificant in comparison with the large and medium firms. Only around 10% of the dairy production is accounted for by about seven small processors, of which two are new. The first was established in 2008 as an initiative of the municipality of Cercado, Cochabamba, having as a counterpart a milk farmer association. The second is a state-owned firm that started in 2011 with three plants. One of these plants is located in the tropical area of Cochabamba and the other two in La Paz and Oruro.

The first firm went bankrupt in 2010. Diverse factors seem to have led to this failure, such as the lack of proper management, since this important task was delegated to a group of milk farmers. The farmers who administrated the firm were members of the farmer association that established the alliance with the municipality. To make the situation worse, the processor did not have capable and experienced personnel in the production area. So production processes and dairy processed products often did not meet certain basic quality standards. It was very common for a thousand liters of milk to be wasted just because of a mistake in the production department or because there was not proper control over the raw milk delivered by the farmers. Additionally, something that is notable and again follows current international trends (as described by Swinnen et al., 2010) is that milk farmers preferred to keep selling their milk to the big firm instead of to the small new one. Despite the fact

that the new small firm was paying the same price as the big firm and was much less demanding in terms of the quality standard controls for the raw milk, they preferred to keep supplying to the large processor.⁴⁹

The new processing firm that is state-owned has three plants, and one of them is located in the tropical area of Cochabamba. Although the mission of this governmental company is to contribute to the development of the farmer and processor segments, offering alternative dairy products of high quality and under parameters of efficiency and competitiveness, it is quite contradictory that the plant in Cochabamba buys the raw milk exclusively from milk farmers of the tropical area. The productivity of milk farmers in this region is the lowest of the department, and the location offers neither comparative nor competitive advantages for the production of cow milk, but it is a political place strongly connected to the current government. Despite this low productivity, the public enterprise pays the same price that the large firm pays to their providers in all the valleys of Cochabamba. Additionally, it offers to its suppliers of raw milk technical assistance and facilities in the provision of certain inputs (i.e. cattle food) by means of other state-owned enterprises.

The trader segment

Regarding the trading segment, activities, and actors, the processing firms use direct and indirect trading mechanisms. The plants trade directly when they have fixed contracts with institutions (i.e. supermarkets, municipalities, firms). The indirect trading is executed by means of intermediaries (distributors, wholesalers, and retailers) with the purpose of covering the maximum geography in terms of the market.

Distributors, wholesalers, and retailers trade nationally, and some of them also import dairy products. Around 90% of the trading of dairy products in Cochabamba involves national goods, and the dairy products produced by the large firm represent 85% of them. Specifically, the most important processing firm in the trading segment is the large one. In terms of size, most dairy traders are micro and small-sized, while a very low percentage (about 5%) can be regarded as medium and large-sized.

It is important to notice that only certain type of traders keep contractual relationships with the big processor (or the firms abroad in the case that they trade imported products). In fact, only wholesalers, distributors, supermarkets, and agencies (shops owned and administered by private companies that trade exclusively products of a particular processor, mainly the large one) have contractual relationships with the big processor. The lead processor, besides offering trade credit, provides certain marketing facilities such as banners, free samples, light signals, and basic assistance. Traders who trade directly with the large firm also have to fulfill some requisites such as a minimum of collateral as a certificate of deposit or a fixed asset. This collateral supports the lending of the plastic boxes in which the large firm delivers the dairy products and the trade credit.

Regarding the prices in the trading segment, the big processing enterprise establishes certain mechanisms in order to determine maximum prices. In the case of distributors, wholesalers, and agencies, the firm determines the prices by means of its commercialization department, and it periodically monitors these traders. In most of the products, the difference between the trading and the factory price is a maximum of around 1%. It means that these traders are motivated to commercialize substantial amounts in order to maximize their benefit and take advantage of economies of scale. In the case of retail traders such as supermarkets, food stores, kiosks, and others, the determination and monitoring of final prices are less rigorous. However, many of the dairy products have a ceiling price that is printed by the large processor on the package of the item as a clear way to suggest to the consumer the maximum price that should be paid for certain product.

⁴⁹ All the information about this firm is based on interviews. There is no official or publicly accessible information with respect to this firm.

The presence of the medium and small processors in the trading sector is scarce in comparison with the big one. Their commercialization channels are less diverse, as are the types of traders that commercialize their products. For example, some small firms only trade their products via their own stores or through supermarkets. In the case of the state-owned processing, most of the sales are directed to the government (at central and municipality levels).

The consumer segment

With respect to consumption, it is possible to distinguish two types of consumers: households and institutions. The most demanded products are milk (liquid and in powder), dairy drinks, yogurt, butter, and artisanal cheese. Despite the fact that the consumption of dairy products has increased in recent years at the national level, from 30 liters per capita in 1996 to 42 liters per capita in 2010, this consumed amount is still significantly under the level recommended by the FAO, which is 150 liters (Fitch Rating, 2010). Also, there are indications that urban middle-class people are willing to pay higher prices for good quality and diverse products. Additionally, an analysis of the Bolivian milk market shows that in 2009 the country produced 287 million milk liters but it consumed 460 million liters (Peppelenbos, 2010). Therefore, it is evident that there is still a substantial potential market for dairy products in Cochabamba and Bolivia in general.

The governance of the chain

As a very important consideration in the dairy chain, we have to look at its control and governance. First, the dairy value chain in Cochabamba seems to have a supply orientation with the strong position of the processing segment. Therefore, the plants play a central role in the production system, determining the type of products and processes, quantities, prices, and trading mechanisms. The power of the plants is mainly represented by the large processor, which has a significant influence in all the segments of the chain, determining entry/exit barriers and prices in the segments of producers, traders, and also consumers.

Most food value chains are typical cases of buyer-driven chains, with supermarkets having the control of the value chain. However, in the particular case of the dairy chain in Cochabamba and in general in Bolivia, we found an exception. It is evident that the large processing firm is the key producer of this chain, commanding in terms of capital investment and technology the whole dairy chain in Cochabamba. It is clearly taking the role of supporting the efficiency of both its suppliers (the milk farmers) and customers (traders and consumers). In addition, as predicted by previous empirical literature (i.e. Gereffi, 2001), producer-driven chains are typically characterized by the presence of FDI. This is precisely the case of our study case, where a Peruvian MNE has the ownership of the large processing business.

Following the approach of governance in terms of coordination as summarized in 2.2, it seems that the large processor has relationships with milk farmers under the figure of directed governance and the sub-type of captive governance. As was established theoretically by Gibbon et al. (2008), under this figure of coordination the buyer (which in this case is the large processor) takes at least 50% of the producers' supply and exerts a high degree of control over other firms in the chain. In addition, our large processor in the dairy chain is specifying the characteristics of the raw milk supplied by the farmers and the processes that will then be followed.

The fact that the large processor exercises control and coordination over the farmer segment through directed governance is not necessarily negative for micro and small actors. In this sense, the demands of the lead firm in terms of certain characteristics that raw milk should have led to the provision of technical assistance, training, and credit facilities from the lead firm to the milk farmers as to a way to offer the possibility that farmers could fulfill those raw milk requisites. Finance can be an incentive for contracts that ensure supply, as well as fund the working capital that a producer needs to upgrade a product to meet the standards required by the lead firm or processor.

Regarding the coordination between the large firm and trade actors, balanced governance seems to be the type that reflects their relationships. We should remember that in this type of coordination, firms develop information-intensive relationships, frequently dividing essential competencies between them, and the interaction is characterized by reciprocal dependence. The large and medium-sized traders, which are the ones who have direct relations with the large firm (i.e. distributors, agencies, supermarkets), depend on the big firm in terms of certain marketing facilities and trade credit. However, the large firm also depends on large and medium-sized traders in order to sell their products in the market.

4.5 Value Chain Finance in the Dairy Chain in Cochabamba, Bolivia

Now that we have described the most important characteristics of our value chain case study, in the present section we focus on the identification of the main value chain financial mechanisms presented in the dairy value chain in Cochabamba, Bolivia. As mentioned before, the large firm buys and processes around 83% of all the raw milk produced by milk farmers in Cochabamba, and it represents 85% of the trading of all dairy products (national and imported) in the department. Therefore, that is the main reason why our analysis will focus on the identification of financial mechanisms that involve relationships between the big firm and the rest of the chain actors in other segments of the chain. As part of this analysis, we also explore the role of governance, social capital, and FDI on value chain finance opportunities. Additionally, as part of our empirical work we also evaluate the effects of an indirect value chain finance mechanism offered by the large processing firm to milk farmers. This evaluation is based on panel data analysis. Finally, we present a more detailed description of some financing features in each of the segments of the dairy chain in Cochabamba. An important characteristic of this descriptive analysis per segment is the consideration of variables such as size, ownership, and age of the firms in each segment as possible determinants of credit access. This consideration is based on the existing international literature about determinants of financial obstacles. This analysis will also permit some comparison of the financial access trends of actors that are part of the value chain (mainly small-sized businesses) with those of small enterprises at the world level, identified in studies such as Beck (2007), Ayyagari et al. (2007a), and Beck et al. (2008a, 2009).

4.5.1 Main value chain financial mechanisms

The identification of the main value chain mechanism in the dairy value chain of Cochabamba, Bolivia is reflected in Figure 3.4. In this figure, in addition to schematizing the relationships between the different actors of the chain we also attempted to outline both direct and indirect value chain financial mechanisms. Direct value chain financial mechanisms take place within the value chain, for example, when an input supplier provides credit to a farmer or when a lead enterprise makes early payments to a market intermediary. On the other hand, external value chain finance implies the actions of actors that are not part of the chain but that extend financial services by means of value chain relationships – for example, a formal financial institution issuing loans to farmers based on a contract that they have with a trusted buyer or processor (who is part of the value chain).

4.5.1.1 Direct value chain financial mechanisms

As we can see in Figure 4.4, direct value chain finance is present along the entire dairy value chain in Cochabamba and all its segments. One important and often financing mechanism appearing in our value chain case is trade credit. Trade credit appears in the following relationships:

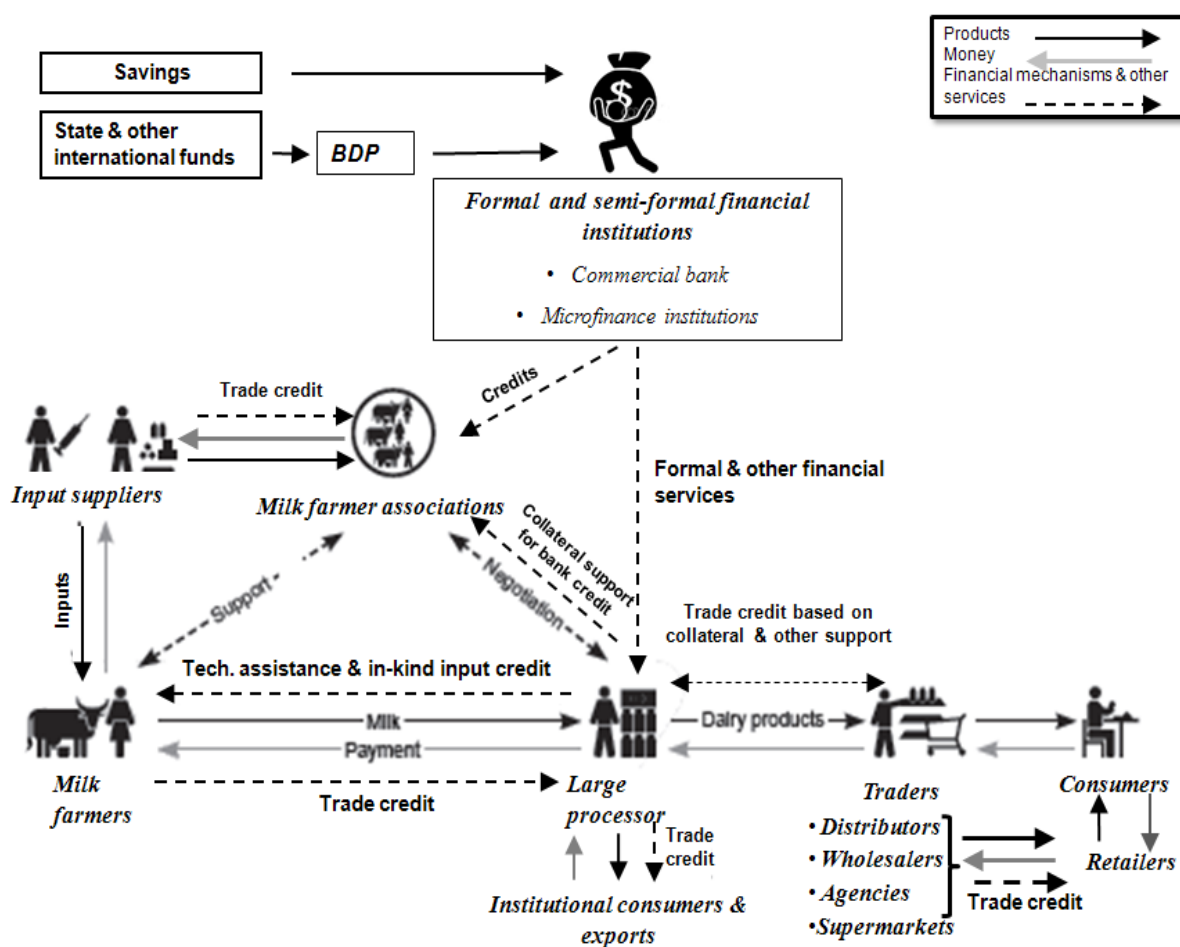
- a) Milk farmers and input suppliers
- b) Milk farmers and the large processor
- c) The large processor and large and medium-sized traders

- d) The large processor and institutional consumers (including clients abroad: exports)
- e) Large and medium traders and retailers

Milk farmers and input suppliers

In the case of the relationship between milk farmers and input suppliers, usually the trade credit is only available for medium and the few large-sized milk farmers. Therefore, most of the milk farmers (who are micro and small-sized) usually have to pay in cash for the various inputs demanded primarily in the feeding (i.e. silage, soya, cottonseed) and care of the cattle (i.e. vaccines, veterinary attention, genetic improvement, stables). The suppliers' trade credit, which is a typical inside value chain financial instrument, is a very limited financial alternative for these actors in the farmer segment.

Figure 4.4. Main value chain financial mechanisms in the dairy chain of Cochabamba, Bolivia



Source: Author's own preparation based on research field work and Peppelenbos (2010)

Theoretically, trade credit is regarded as a good alternative of finance, since it alleviates the adverse selection problems that are typical between financial intermediaries and firms. It is assumed that suppliers can incorporate in the lending relation the information that they have about their customers (Biais & Gollier, 1997). However, it seems that in general suppliers perceive a high risk in farming activities.

In this context, the farmer milk associations thus appear to enable or improve the mechanism of trade credit from input suppliers to milk farmers in general and to offer many other facilities as well, such as technical assistance, training, low-priced veterinary services, and laboratory services. These farmer associations, based on a small contribution by their members (2% twice per month on the sales of raw milk to the big processor), cover administrative costs and make possible the provision of the facilities mentioned. In the case of the inputs, the associations take advantage of the knowledge and experience of their officers to bargain with large-sized input providers. So the price and conditions (mainly reflected in trade credits) are often more convenient than if farmers were to negotiate independently. Additionally, even though the large processor has most of the power in the determination of the price of the raw milk, farmer associations are called once a year to bargain with the large processor.

Some services such as training and technical assistance usually do not have costs for member associations, and some training programs even include non-affiliate farmers. In fact, various training programs take place covering modules and particular geographical locations, where there is always the possibility that there are some milk farmers who are not members of the association. Other facilities such as the veterinary attention, genetic improvement of the cattle, vaccination, medicines, vitamins, and feeding inputs have costs. However, most of these inputs and services are provided by the organizations to their members with convenient prices and terms, as is the option of trade credit, which usually has a maximum term of 30 days. It is evident that associations can make good deals with important providers not only in terms of price but also in terms of quality, time, and constant provision and payment options.

Milk farmers who are not associates can also access most of the input facilities and services offered by farmer associations. However, these non-associate milk farmers have to pay a price that is frequently between 5 and 10% higher than the price for associates, and they cannot have the option of trade credit.

The situation described in the paragraphs above highlights the role of milk farmer associations in terms of allowing direct finance value chain mechanisms that contribute to the financing of working capital. Various inputs and services that enable the dairy activity for farmers are provided by way of the actions of these organizations. Farmers, who are mostly micro and small-sized, are not considered “reliable” by their suppliers. However, through these organizations they become indirectly “trustworthy” and can access trade credit. Therefore, the associations play two key roles: facilitating access to finance and minimizing certain production costs for the milk farmers. Additionally, the fact that outsiders can also benefit from these associations suggests the presence of freeriding. As Durlauf and Fafchamps (2005) noticed, social capital – in our case in the figure of farmer organizations – generates favorable externalities without non-individual returns for the holders of social capital.

Milk farmers and the large processor

In the relationship between milk farmers and the large processor, the trade credit goes in both directions. The large processor, aside from supplying technical assistance, training, and in some cases certain materials or equipment for the collection of raw milk, offers certain credits in kind. Some feeding inputs such as soya and maize are bought by the big processor in order to extend credits in kind, for which payments are then deducted directly from the next two bi-weekly payments that the big firm makes for the raw milk to the farmers. However, there is evidence that in 2012 this facility did not have a significant demand, since farmer associations do the same and seemingly with in more convenient prices and trade credit conditions.

For their part, milk farmers also finance the big firm through trade credit. The raw milk that farmers deliver to the big processor is paid for two weeks later. Thus, there is evidence that finance might be

flowing in the wrong directions as the studies of Swinnen and Maertens (2010) and Swinnen et al. (2010) suggest when they refer to the limitations of value chain finance.

Large processor-traders and traders-traders

With respect to the large processor and its relationship with traders, the large processor has direct contact only with large and medium-sized traders such as distributors, wholesalers, supermarkets, and agencies. The large firm offers the trade credit facility to them only if certain requisites such as physical or financial collateral are fulfilled. In some particular cases, such as the agencies of the large processor that are shops selling exclusively the brands of the big processing firm at wholesale prices, not only the trade credit but also the possibility to engage and maintain a contractual relationship with the large enterprise depends on having “hard collateral,” certain refrigeration equipment, and exhibition furniture, and meeting minimum size and other conditions for a showroom.

Since these conditions for having direct trade contact with the large enterprise are very hard to achieve for micro and small-sized traders, it is evident that such relationships between them do not exist. The most common scenario is one where retailers buy from distributors, wholesalers, and agencies. In these last contractual relationships the trade credit is not common, since most retailers are micro and small-sized business. So they are not regarded as creditworthy even for a direct finance value chain option such as the trade credit. In any case, there is evidence that some small retailing businesses that sell dairy and other food products have important possibilities to access credit through microfinance institutions using non-conventional collateral as personal and group guarantees or the inventory of long life goods. This is a type of finance option that is totally outside of the value chain and that in any case is part of the financial system.

Large processor and institutional consumers

Finally, considering the relationship of the large processor and certain institutional consumers, it is evident that trade credit is available as a financial mechanism. Of course, the firm offers certain advantages (mainly reflected in a lower price) when the transactions are paid in cash with the purpose of encouraging immediate payment.

4.5.1.2 Indirect value chain financial mechanisms

As we can observe in Figure 4.4, indirect value chain mechanisms are only present in the relationship between milk farmers and the large firm. However, the existent credit facility extended to milk farmers involves not only the formal financial institutions that provide the credit⁵⁰, the farmers, and the contractual relationship existent between farmers and the processor, but also milk farmer associations.

Milk farmer associations appear as a kind of link between formal financial institutions and farmers. Much of the credits in kind and in cash offered by the association to their members come from credits conferred by a commercial bank and supported with the guarantee of the large processor by means of a letter of credit. This collateral facility has only been enabled since 2000, around 3 years after the foreign acquisition of the large processor. There are two types of credit provided by the farmer associations: one that is short-term (1 year) and is provided yearly and one that is medium-term (3 years) and is supplied periodically by the bank. The first is used to finance the working capital necessities of the farmers, and it is extended to the association members in the form of credits in cash and in kind. The second is more directed to financing investment demands of the associate farmers such as cold tanks and stables, and it is supplied to them in cash.

⁵⁰This formal deposit institution is foreign-owned and is one of the most important banks of the Bolivian financial system. In comparison with other banks such as Banco Sol, Banco FIE, and Banco Los Andes, this foreign bank does not focus primarily on microfinance.

The lead firm, in addition to facilitating the letter of credit as collateral, also acts as a “retention agent,” discounting methodically the quotas of the credits (in cash and in kind) that the milk farmer acquires from its farmer association. These discounts are made from the bi-weekly payments for the raw milk that farmers sell to this lead industrial processor, and they are transferred to the farmer associations. Therefore, there is practically no possibility that milk farmers will give priority to other uses of this income or engage in other morally hazardous practices.

The notable decrease in transaction costs for the financial institution (i.e. information and monitoring costs) associated with information asymmetries seems to be the main reason why the financial intermediary does not establish a direct relation with the farmers. The transaction costs and risks for the financial institutions related to the payback of the credits are lower if the milk farmer associations intermediate between the financial institution and the milk farmer.

Additionally, we have to emphasize the significant function of the large processor in collateralizing the credits allocated to the associations by the commercial bank. Without this collateral, associations by themselves would not be able to access credit, since the financial system does not consider these organizations as creditworthy because they are not profit-making organizations.

It is also important to mention that in recent years there were some governmental financial access initiatives to benefit milk farmers. The most recent was introduced in April 2012 providing funds to improve the quality of cattle and infrastructure. However, unlike past state interventions, these funds have been supplied as loans issued by a commercial bank and a semiformal financial institution. Additionally, these credits have been given to milk farmers only by means of farmer associations. However, it seems that there are no clear criteria about how much credit should correspond to each of the various farmer associations that have been established in Cochabamba. For example, the oldest and largest farmer association, which has around 1,500 members, received the same credit amount as another small, new association with about 60 members. It also calls attention to the sudden appearance of some farmer associations just when the finance program was being launched and the non-legal status of some farmer organizations that benefited from the funds.

Another government financial provision program took place in 2007. This time, the state supplied funds to certain selected milk farmer associations in the High Valley of Cochabamba in the form of “grants.” Sadly, again there was no clarity about the reasons for choosing the farmer associations to be assisted and determining the amount of funds to be allocated for each farmer organization. Additionally, until now there has not been a perceptible positive effect of these funds on milk farmers in the recipient locations and farmer organizations. In any case, because of this plan, when the government announced its loan initiative in 2012 aimed at improving the quality of the cattle and infrastructure in the milk farmer sector, some farmer associations were demanding that these funds be given under the category of grants instead of loans.

4.5.2 Governance, FDI, upgrading and value chain finance

Governance, value chain finance and upgrading

As we explained in Section 4, the dairy value chain in Cochabamba, Bolivia is producer-driven. The governance of the whole chain is exerted by the large processing firm that is foreign-owned. Since the governor of the chain has more options to access financial resources than other value chain actors, it is evident that its power and leadership in the chain influences financial access for other actors mainly of the milk farmer and trade segments. It is expected that the lead firm may allow access to finance for the other agents in the chain in the form of direct and indirect value chain finance mechanisms. Allowing access to finance for micro and small agents in the chain could give to them the chance to take upgrading opportunities. In the particular case of micro and small milk farmers, their returns are so low that the possibilities to upgrade and expand their production with their own resources would be very remote.

However, we must also consider that the power exerted by the large processor in the value chain could also limit the upgrading of the rest of the actors in certain circumstances. For example, despite the substantial benefits generated by the provision of credits in kind and other facilities (direct value chain finance), and particularly the access to formal credit through farmer associations by way of the support of collateral issued by the large firm (indirect value chain finance), farmer organizations usually receive smaller amounts than their credit needs. To mention the case of the biggest farmer association, in 2012 it received around 31% of the amount of the credit that it needed to finance the demands of its associates, both in terms of working and investment capital.

If we consider that the coordination exercised by the lead firm in the milk farmer segment of the chain is under the category of directed governance, consistently with the theory, the large firm seems to be encouraged to provide finance and other facilities. In fact, with the purpose of ensuring a consistent, reliable, and adequate supply of raw milk, the large firm might be motivated to provide technical assistance, training, and finance (direct and indirect) as a way to guarantee certain product characteristics. Access to credit could be an incentive for contracts that ensures supply, as well as funding of the working capital that a farmer needs to upgrade a product to meet the features required for the lead processor. However, it is worth considering that value chain finance mechanisms under this type of coordination are more focused on the financing of working capital than investment capital. They would only promote product upgrading, without affecting process upgrading; that is also desirable in the milk farmer segment.

On the other hand, despite the fact that under directed and particularly captive coordination – as is the form of the connection between the big processor and its raw milk suppliers – the generation of direct value chain finance is more likely, we also found important evidence about the presence of indirect value chain finance in our case study. As noted, the main manifestation of this type of value chain finance is the figure of the associations providing credit to their members with loans coming from a formal institution, supported by collateral provided by the large processing firm. This type of value chain finance mechanism also leads to medium-term finance and consequently could have a positive impact in terms of technological innovation and productivity. Consequently, there is a chance for it to generate upgrading in terms of process in this segment. However, this possibility is limited because of the absence of long-term finance.

Indeed, it seems that this captive coordination leads to the gaining of production capabilities. Based on the interviews with milk farmers and officers of farmer associations, there is evidence that milk farmers in Cochabamba have been learning important aspects related with the improvement of the production of raw milk in terms of quantity and quality. It is evident that the demands of the lead firm and its support in terms of technical assistance, training, and access to finance could explain to some extent the productivity increase that has been taking place in this sector. Nevertheless, it is also manifest that this support falls short in terms of meeting the expectations of the sector. According to the head officer of one of the biggest farmer associations, the credit supported by the large firm only covers around 50% of the financial necessities of their associates.

Considering the type of coordination that exists between the large processor and the traders, although the power of the whole chain is exercised by the big processing firm, this power is more balanced. The two parts – the large processor and the traders – have clear interdependencies. At least this is the case of traders who have contractual relationships with the big dairy processor such as distributors, wholesalers, and agencies. This interdependence is precisely the one that generates opportunities for value chain finance and consequently upgrading. The large firm provides the possibility to access trade credit and a few other marketing facilities, only if certain conditions are satisfied. Traders have the option to explore other goods or brands' trading opportunities if the conditions of the big enterprise are not convenient for them. Comparing the credit options and facilities that the large firm offers to milk farmers, they are relatively scarce for traders. It seems that

the large processor is less motivated to support trading actors. Perhaps this situation responds to the chances to identify alternative buyers and sellers; that is described by Johnston and Meyer (2008) as a typical characteristic of balanced coordination.

FDI, horizontal and vertical spillovers

Concerning the issue of governance in the dairy value chain of Cochabamba, Bolivia, we must also consider that the lead firm of the whole chain is foreign-owned. Therefore, upgrading in the different chain segments could take place not only by means of the financial opportunities generated by the governor firm of the value chain but also by means of FDI itself. Foreign enterprises may have efficiency and other horizontal and vertical spillovers on local firms.

The case of the large processor of the dairy value chain in Cochabamba could be considered as an indication that foreign direct investment would have positive effects on local actors. This positive influence seems to be exerted on both local processing competitors (horizontal spillovers) and on downstream and upstream domestic business (vertical spillovers).

Regarding horizontal spillovers, although literature on FDI recognizes that the generation of vertical externalities is more likely than horizontal ones, we found some proof about the generation of horizontal spillovers on some of the local firms that process dairy products in Cochabamba. Although these spillovers are limited and far from being regarded as efficiency improvements, apparently the medium-sized processing firm and another small one (the public enterprise) have imitated and followed the large one in certain processes and products. That is the case of diverse dairy drinks and the fresh milk UHT, which needs a special process and technology that permits this milk to be conserved for a longer time and without refrigeration.

The generation of vertical spillovers is more marked, since the foreign processing company has strengthened a process of vertical coordination through contracting with local suppliers, mainly milk farmers. The contracting is associated with enhanced standard requirements for raw milk, while at the same time this lead firm provides assistance programs to facilitate access to credit, inputs, training, and technical assistance. It is clear that the foreign processor is encouraged to transfer certain knowledge to their local suppliers since such transference would give advantages in terms of improving input quality, lowering costs, and receiving inputs on time.

Additionally, there is also the possibility that the foreign processing firm is producing certain vertical spillovers in upstream business. This is manifest in the case of some trading enterprises that benefit from some basic marketing assistance. Moreover, the fact that some traders have to follow certain minimal infrastructure and equipment requirements demanded by the seller (the foreign processor) could also give rise to improvements.

FDI and financialization

The large dairy processor is owned since 1996 by a Peruvian company, well-known internationally as Gloria S.A. It is an industrial conglomerate of Peruvian investments with a business presence throughout Peru, as well as in Bolivia, Colombia, Ecuador, Argentina, Puerto Rico and Uruguay. Its activities range from dairy and food to cement, paper, agro-industry, transport, and other services.

The strategic growth and strengthening of the Gloria Group is based on the leading position of its brands in the markets where it operates. This leadership is established by constant investment in technology that allows cost efficiencies and the continuous development of products. The diversity and quality of the products the group manufactures and sells, added to an effective distribution and transport capacity that allows it to reach all the markets it supplies, enable this company to create synergies that ensure a diversified business structure capable of achieving a successful performance in a highly competitive environment.

Additionally, recent reports show that Gloria has very strong financial indicators. Its good indicators of efficiency, liquidity (cash flow) and debt are the main factors explaining its risk classification in the category AA. As we can see in Table 4.2, contrary to the hypothesis of Milberg (2008, 2010) that transnational firms have a tendency to become like financial centers, switching their investments from industry to financial markets, Gloria has increased their fixed assets in recent years. So the phenomenon of financialization that Milberg (2008, 2010) found in U.S. transnational lead firms seems not to be the case with the Peruvian transnational, which has major investments in Bolivia in the food and cement sectors.

Table 4.2. Gloria S.A.: Financial indicators (2009-2012)

In thousands of new peruvian soles of December 2012				
	Dec. 2009	Dec. 2010	Dec. 2011	Dec.2012
Total Assets	2,193,199	2,326,593	2,255,914	2,436,811
Debts	436,41	423,733	358,914	390,032
Existencies	301,949	429,478	421,837	567,477
Fixed assets	856,419	986,971	1,079,410	1,165,852
Total liabilities	899,808	946,958	927,842	1,037,295
Net worth	1,293,391	1,379,635	1,328,072	1,399,516
Net sales	2,215,968	2,419,404	2,551,233	2,806,691
Gross profit	496,992	598,031	572,253	695,153
Operational profit	261,109	315,711	295,78	356,761
Net profit	200,625	238,855	193,945	241,622
Operational profit /sales	11.80%	13.00%	11.60%	12.70%
Profit /sales	9.10%	9.90%	7.60%	8.60%
Profitability /average net worth	17.60%	17.90%	14.30%	17.70%
Profitability /assets	10.00%	10.60%	8.50%	10.30%
Current cash flow	2.87	2.23	1.86	1.66
Debts /net worth	0.7	0.69	0.7	0.74
Financial liabilities /net worth	0.41	0.31	0.34	0.34
% Short term debt	42.80%	51.20%	55.40%	60.80%

Source: Author's own preparation based on Class & Asociados (2012 & 2013)

One of the reasons that would explain why Gloria S.A. has not taken a “shareholder value orientation” – a main feature of financialization – is that the majority of its shares (about 75%) are owned by two brothers.⁵¹ Therefore, there is not much shareholder pressure in terms of higher and quicker profits. In addition, it seems that the Peruvian MNE has not shifted from a trend of “retain and reinvest” to “downsize and distribute.” In any case, during 2012 it capitalized accumulated profits and increased its investment shares (Stockhammer, 2010; Class & Asociados, 2013).

There are indications that Gloria S.A., by way of its different subsidiaries in some Latin American countries, has been involved recently in off-shoring practices in order to increase its profits. However, we did not find proof that there is a shift in the use of these increased profits, which usually is reflected in less investment. Additionally, as we can observe in Table 3.2, even though there have been some variations in the net worth in recent years they are closely related to the acquisitions and selling of stock equity of certain firms in Bolivia, Argentina, Ecuador, Peru, and Uruguay.

4.5.3 The role of social capital on value chain finance

It is clear that the unique indirect value chain mechanisms that exist in the dairy chain in Cochabamba are in the segment of milk farmers. However, as we have shown in both 1) the commercial credit collateralized by the big firm and 2) the government funds intermediated by means of certain banks and semiformal institutions, the key connection between the financial institutions and the milk farmers is the farmer association. It seems that despite the existence of contractual relationships

⁵¹ Vito and Jorge Rodriguez Rodriguez.

between the lead firm and the milk farmer, financial institutions still perceive considerable credit risk in direct transactions with the farmers. Therefore, the farmer associations serve to diminish information asymmetries and make thousands of milk farmers creditworthy. Representing their members, milk farmer associations extend credit facilities that farmers could hardly get on their own, since a farmer alone is essentially not considered reliable by financial institutions.

As we showed in Section 5.1.1, social capital as reflected in the figure of farmer associations also plays an important role in reinforcing direct value chain mechanisms. For example, as we have seen, milk farmers buy certain inputs from suppliers who rarely extend trade credit, especially to micro or small farmers. Usually the payment cannot be delayed. However, if farmer associations make the negotiations with input suppliers, they buy in significant volumes and can offer to associate farmers lower prices, trade credit, and better conditions. Additionally, these organizations offer to their members other services such as veterinary attention, vaccination, insemination, technical assistance, and training.

Both in the indirect and direct value chain mechanism, the role of the farmer associations is more than just to link farmers with markets (i.e. input and credit market). The associations coordinate with the lead firm so that the latter plays the role of “retention agent,” discounting methodically the equivalent of the credits and other services that the producer acquires from the association. Therefore, the risk of the producer prioritizing other uses of the income of milk sales or engaging in other “hidden actions” (moral hazards) is practically nonexistent. This may be the main reason why the financial intermediary and the input suppliers do not establish direct relations with milk farmers. The transaction costs and risks for the financial institutions relating to the paying back of the credits are likely much less if the farmer associations intermediate between the financial institution and the milk farmer.

Another important issue related to the facilities and services that are provided for farmer’s groups is “free riding.” Technical assistance and training free programs usually reach all milk farmers of a particular location: both associates and non-associates. The supply of inputs and services is also available for non-members at a higher price than in the case of members and without the possibility of any type of credit (trade credit, in kind or in cash). However, at least in the case of the biggest association the differences between associates’ prices and non-associates’ prices are no more than 10%. Therefore, although certain farmer association services also benefit “outsiders,” the benefits of social capital are not being fully captured for “outsiders.” This might be an incentive for the holders of social capital (the associate milk farmers) to keep incurring the costs of such social networks (associations).

A farmer association has to cover certain administrative and functioning costs, which are partly covered by a fee that is paid periodically by the associates.⁵² So since associate milk farmers are paying that membership fee, they are supporting the association and in return can access several facilities provided by the farmer association. These facilities, such as credits in kind and in cash, training, technical assistance, veterinarian services, convenient prices and availability for various inputs necessary for dairy activities, and representation, are among some reasons why milk farmers support associations.

In general, it seems that farmer associations are improving efficiency in the milk farmer segment and in the whole chain. They not only organize their associates but primarily negotiate prices with buyers and suppliers and support their members with diverse services including various options of credit (in cash, in kind and trade credit). Additionally, they also reduce the transaction costs of financial institutions since they take over the search of information, credit evaluation, monitoring, and payment enforcement procedures. All these functions performed by farmer associations show that social

⁵² This fee is 2% of the biweekly payments that the large firm makes to the farmers for raw milk.

capital might be improving efficiency through information sharing, coordination and leadership, and group identity and modifications of preferences (Durlauf & Fafchamps, 2005). However, we also have to recognize the existence of some “corrupt” associations, such as some that seem to act as profit-making organizations. For example, there is evidence that certain small and non-legal associations are mainly acting as “retailers” of important cattle food and other inputs necessary to the dairy farmer’s activities.

4.5.4 Evaluating the impact of a value chain financial access facility on the farmer segment

As we just have established, the case of the dairy chain in Cochabamba, Bolivia exhibits the significance of farmer associations enabling and extending direct and indirect value chain financial mechanisms. In the case of indirect finance, the milk farmer associations serve as a kind of intermediary between the formal financial institutions and the farmers. The credits in kind and in cash offered by the association to their members come from a credit conferred by a formal financial intermediary and accomplished with the guarantee of the large processor by means of a letter of credit (supported by the contractual relations with the producers and the agreements that the large firm has with the association). Without this collateral, associations would not have any chance to access credit because the financial system does not regard these non-profit making organizations as “reliable.” Additionally, we must note that this collateral facility has only been enabled since 2000, around 3 years after the privatization of the largest processor by the Gloria foreign consortium.

Since credit access and the use of credit are aspects that have varied over time and there is the necessity to evaluate the effects of this variation on farmers’ milk production, we have considered panel data analysis as the most suitable technique for this purpose. For this type of econometric analysis we have considered two procedures: fixed effects (FE) and random effects.

Fixed effects models are designed to study the causes of changes within a person or entity (In our case, this entity is the milk production of each farmer). Each entity has its own individual characteristics that may or may not influence the predictor variables (For example, the farm location could influence the quantity and quality of milk produced, or the position of the shareholders in the big processor firm could have some effect on milk production). When we choose FE techniques, we assume that something within the individual may impact or bias the predictor or outcome variables, and we need to control for this. Additionally, FE models remove the effect of those time-invariant characteristics from the predictor variables so that we can assess the predictors’ net effect. These time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different; therefore, the entity’s error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated, then FE estimations are not suitable, since inferences may not be correct. Therefore, we need to model that relationship using an alternative model, such as random effects.

Contrary to an FE model, in random effects estimations the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. If there are reasons to believe that differences across entities have some influence on the dependent variable, then we should use random effects. Consequently, we need to specify those individual characteristics that may or may not influence the predictor variables. The problem with this is that some variables may not be available, therefore leading to omitted variable bias in the model (i.e. technology, capital investment, number of workers, size of farm). An advantage of random effects is that we can include time-invariant variables (i.e. location). In the fixed effects model these variables are absorbed by the intercept. To decide between FE and RE techniques, we have to consider the characteristics of our case study. Additionally, the Hausman test is an important argument when choosing between these two panel options (Kohler & Kreuter, 2009; Torres, 2011).

To summarize, the equations estimated by FE (1) and RE (2) techniques are, respectively:

$$Y_{it} = \beta_1(\text{CREDIT})_{it} + \beta_2 X_{it} + \alpha_i + u_{it} \quad (1)$$

$$Y_{it} = \beta_1(\text{CREDIT})_{it} + \beta_2 X_{it} + \alpha + u_i + \varepsilon_{it} \quad (2)$$

In the two equations, Y_{it} is the dependent variable, where i = entity and t = time. In our case this variable is the milk production that is sold by every farmer, measured alternatively in terms of quantity and quality for a bi-weekly period for the years 1998, 2002, and 2012. CREDIT is the variable access to credit measured by a dummy. X_{it} refers to a set of variables that also influences milk production aside from credit access. As part of these control variables, we have the price that the large processing firm pays per liter of raw milk and a dummy that captures the position or non-position of the milk farmer as a shareholder of the large firm. β_1 and β_2 are the coefficients for the CREDIT and control variables. In the FE equation (1), α_i is the unknown intercept for each entity (n entity-specific intercepts) and u_{it} is the error term, while in the RE equation (2), α is the population unknown intercept, u_i is the between-entity error, and ε_{it} is within-entity error.

4.5.4.1 Econometric results

The econometric analysis of the data started with the descriptive study of the information (see Annexes). This description shows that we have at least two observations across time per variable for 979 farmers, which in total counts for 2741 observations. Since data is not available for the selected years for all associate farmers, our dataset is “unbalanced.” However, that is not a problem for panel data analysis since we can still run the models exploiting all the available information. Another option would be to balance the dataset by discarding the cases that do not have the 3-year data; however, that would mean losing a substantial number of cases and observations. We should be aware that in either of these selection options it is likely that we are incurring a selection bias, since there is the possibility that farmers who could not handle the higher norms introduced by the foreign-owned processor disappeared. So our sample would be composed only by those farmers who stay and could make the higher standards. Additionally, given the restrictions in terms of data about our observation units, it is likely that we are incurring the omitted variable problem.

As explained, both fixed and random effects panel models seem to be good alternatives to estimate the effect of the use of credit on farmer milk production. Therefore, we ran both models using as the dependent variable the production of milk in terms of quantity and quality. Table 4.3 summarizes these estimations. In addition to the estimated coefficients for each of the explanatory variables considered in the model, the significance of the t-statistic (Sig P>|t|) is also reported. Furthermore, with the purpose of evaluating the significance of each of the overall models, the F statistic and the WChi² are considered for the FE and RE estimations, respectively. Table 4.3, also registers the values of R square; however, we must consider that

...the computation of goodness of fit measures in panel data is somewhat uncommon. One reason is the fact that one may attach different importance to explaining the within and between variation in the data. Another reason is that the usual R2 or adjusted R2 criteria are only appropriate if the model is estimated by OLS. (...) It seems appropriate to ignore this part of the model (Verbeek, 2000, p. 320).

On the one hand, fixed effect estimations (models 1 and 4) seem the most proper type of estimations since our goal is to study the role of the use of association credit in explaining changes in milk production within a farmer⁵⁴. On the other hand, random effects estimations (models 2, 3, 5, & 6) also look appropriate since they allow including time-invariant variables (in our case, the dummy referring to the shareholder position of the farmer)⁵⁵. However, in random effects we need to specify other individual characteristics that may or may not influence the predictor variables. The issue is that we

⁵⁴ In fact, fixed effect panel models are designed to study the causes of changes within an entity or person (Torres, 2011).

⁵⁵ Random effects models assume that the entity's error term is not correlated with the predictors, which allows for time-invariant variables to play a role as explanatory variables (Torres, 2011).

have very limited information about dairy farmers; therefore, we could have an omitted variable bias in the random model.

Additional to the considerations mentioned, we ran the Hausman test in order to determine the best model between fixed effects and random effects. Based on this test, the fixed effects models (models 1 and 4) turned out to be better than the random effects models (see Annexes).

Regarding the estimated coefficients and the significance for the indicator of the use of credit (CREDIT), the results suggest that the use of credit exerts a positive influence on farm milk production both in terms of quantity and quality. In this sense, models 1 and 4 suggest that a farmer that has a credit provided by the association would increase its production by around 44% in terms of liters and would also improve the quality of its milk, giving rise to a fat content increase in milk of around 1%. In this sense, in addition to highlighting the importance of credit for dairy farmer, the results implicitly show the significant role of farmer associations (as a clear manifestation of social capital) and of the largest processor's easing of access to credit for these agents of the dairy chain in Cochabamba, Bolivia.

However, we also have to consider that the role of the large firm in easing financial access is specifically related to the chain's governance. Here the large processor, by means of providing collateral, is taking the responsibility for assisting the efficiency of its raw milk suppliers. Additionally, enhancing the access to finance for farmers in the chain could give them the chance to take upgrading opportunities. Nevertheless, since the large firm has the power to drive the chain according to its interests, it could also use access to finance as a mechanism to manipulate or limit milk farmer production and upgrading. A clear signal is that the big processor year by year indirectly determines the amount of the credit, by issuing a letter of credit that allows up to a maximum amount. The credit demands of producer associations are usually much higher than the received credits supported by the collateral of the large firm.⁵⁶

**Table 4.3. Impact of introduction of credit facilities on farmers' milk production
(Robust panel estimations)**

Variables	Dependent: Ln (quantity)			Dependent: Ln (quality)		
	Fixed Effects	Random Effects		Fixed Effects	Random Effects	
Explanatory	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	5.61**	5.41**	5.62**	1.22**	1.23**	1.22**
Sig P> t	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
CREDIT	0.38**	0.44**	0.44**	0.01**	0.01**	0.01**
Sig P> t	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
PRICE	0.39**	0.37**	0.36**	-0.003**	-0.003*	-0.003*
Sig P> t	(.00)	(.00)	(.00)	(.00)	(.01)	(.01)
SHAREHOLDER	dropped	0.21		dropped	-0.005	
Sig P> t	-----	(.22)		-----	(.29)	
Within R ²	.41	.45	.41	.02	.02	.02
Between R ²	.07	.08	.08	.003	.003	.002
Overall R ²	.27	.25	.25	.01	.01	.01
F	595.63			16.22		
Probability	(.00)			(.00)		
WChi2		1288.80	1293.00		30.10	28.12
Probability		(.00)	(.00)		(.00)	(.00)

Note: ** and * denote significance at the 1% and 5% level, respectively.

Source: Author's own preparation based on original estimations

⁵⁶ For example, for 2012 one of the largest milk farmer associations demanded a credit of around 8 million USD; however, the large firm extended a credit letter providing access to a credit of only 2 million USD.

4.5.5 More about finance along the segments of the dairy chain in Cochabamba

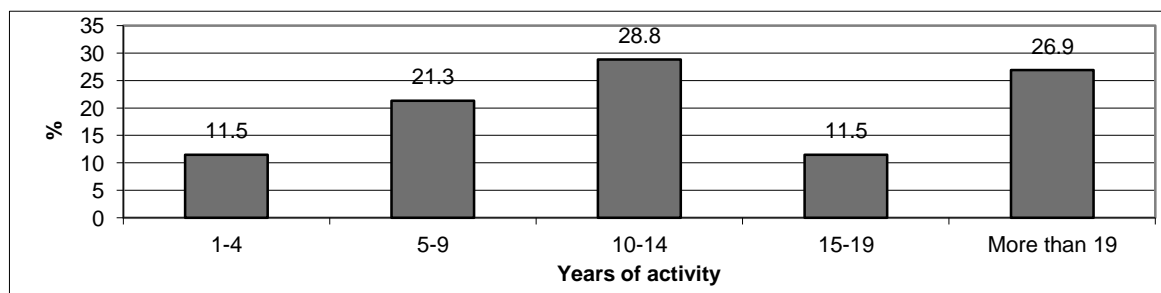
Regarding the description and a more detailed analysis of some financing features in each of the segments of the dairy chain in Cochabamba, the sources of short and long-term finance were identified. Additionally, we dealt with the characteristics of actual credit and the principal problems related to access to finance in the perception of the actors involved in the different segments of the dairy value chain in Cochabamba, Bolivia.

Another characteristic of this analysis is the consideration of variables such as size, ownership, and age of the firms in each segment; as possible determinants of access to finance. This consideration is based on the existing international literature about determinants of financial obstacles. As we have seen, studies such as Beck et al. (2003), Beck and Demirgüç-Kunt (2006a), Beck (2007), and Beck et al. (2008a, 2009) found that age, size, and ownership are the main firm features best predicting financing obstacles. Therefore, it is expected that older, larger, and foreign-owned firms (actors) participating in the dairy chain face less financing constraints. Additionally, we have considered the geographical location of the actors, since in some municipalities where the agents of the chain are located, the presence of financial institution branches could be very limited or non-existent. Therefore, in these locations the value chain financial mechanisms could be the only available alternative to access finance.

4.5.5.1 Milk farmer segment

Considering the years of activity of the milk farmers (age of firm), more than 90% of farmers considered in our sample have been involved at least 5 years in the production of raw milk⁶⁰ (See Figure 4.5). Based on international patterns, we could expect that older firms could have more access to finance. Additionally, supported by the evidence of Chavis et al. (2009), younger businesses would rely less on formal financing and more on informal financing.

Figure 4.5. Years of activity of milk farmers (in %)



Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

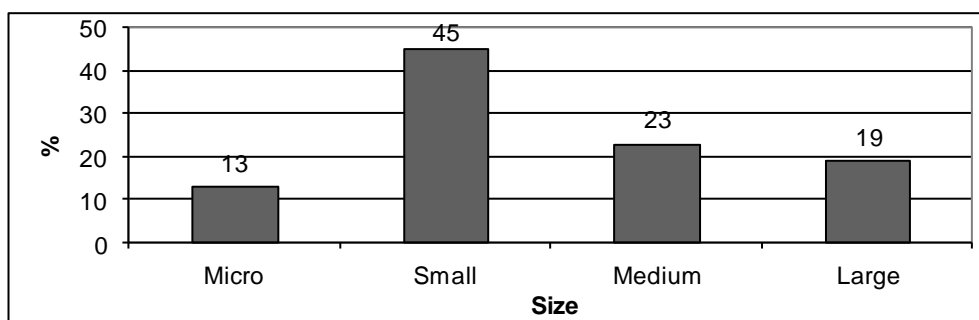
As for the size⁶¹ of milk farmers, it is evident that small ones predominate in this segment. As we can observe in Figure 4.6, around 81% of the milk farmers in Cochabamba are micro, small, and medium-sized, while large farmers represent only 19%. Therefore, not all farmers are in equal conditions in terms of access to finance. International cross-country studies have already revealed that micro, small, and medium-sized businesses face more external finance constraints than large ones. Additionally, if age and size are considered at the same time, our sample data reveals that around 80% of micro and small producers have less than 15 years of experience in the activity, while at least 80% of medium and large producer have more than 15 years of experience in the activity. Therefore, when regarding

⁶⁰ Complementing the information collected in the workshops with Cattle Census (2004) indicates that milk producers have an average of 17 years of experience in the activity.

⁶¹ The definition of size has some similarity with the five categories considered by FEPROLE-COOPROLE (2004). The size micro corresponds to category 1 (E1) with production of less than 24 ltrs/day, the small is the one that produces between 25-84 ltrs/day and corresponds to category 2 (E2), the medium-sized producer is situated in the production intervals of 85-144 ltrs/day (E3) and 155-204 ltrs/day (E4), and finally large is the one that produces over 205 ltrs/day, which corresponds to category 5 (E5).

age as a determinant of financial constraints, we could expect that medium and large milk producers would have fewer limitations to accessing finance than micro and small ones, given not only their size but also the longer time that they are involved in the activity.

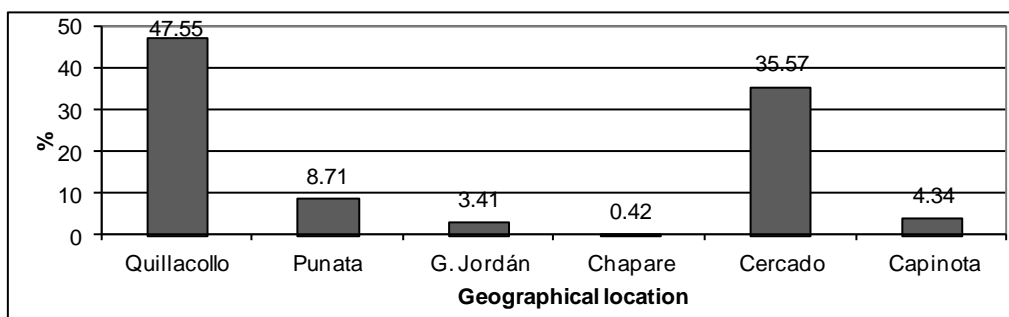
Figure 4.6. Size of the producers (in %)



Source: Author's own preparation based on FEPROLE-COOPROLE (2004)

Concerning the geographical location of milk farmers, as can be seen in Figure 4.7, a substantial number of them are located in the provinces of Cercado (which is part of Central Valley) and Quillacollo (which is part of South Valley). In these two locations, the supply of financial services (formal and semiformal) – represented by the number of financial institution branches – is much higher than in other locations where farmers are involved in dairy activities. Cercado and Quillacollo have around 70 and 11 financial institution branches, respectively. In Punata, Capinota, Chapare, and Jordan, financial services coverage is much lower, reflected in the presence of 5, 2, 4, and 0 financial branches⁶², respectively. This would imply that access to finance (at least in terms of supply) is even more critical for milk farmers located in these last provinces.⁶³

Figure 4.7. Geographical location of the producers (in %)



Source: Author's own preparation based on FEPROLE-COOPROLE (2004)

Concerning the principal economic activity carried out by the milk farmers, it is known that in some cases the dairy activity is conducted parallel to other activities such as agriculture. In our sample of interviewed milk farmers, around 60% of them had as their main economic activity the production of raw milk. For the rest of the milk farmers, the dairy activity was the second or even the third economic activity. Additionally, it is interesting to differentiate the principal activity of the producers according to size. Only in the case of medium and large-sized farmers is the production of milk the principal and even in some cases the only economic activity. In the case of the micro and small producers, the situation is quite different, since they seem to prioritize other economic activities or to diversify them. This difference seems related to the size of the milk farmer. For example, in the case of the micro-

⁶² Based on data in FINRURAL (2004), "Cobertura de servicios financieros por municipios en Bolivia," La Paz, Bolivia.

⁶³ The dairy basin in Cochabamba is a zone that has favourable conditions for agricultural and cattle activity. Currently it covers the High, Central, and Low Valleys. It includes the provinces Punata (Punata and San Benito), German Jordán (Cliza and Toko), Cercado, Capinota (Capinota and Santiváñez), and Quillacollo (Colcapirhua, Quillacollo, Sipe Sipe, Tiquipaya, and Vinto) (Cattle Census 2004:17).

sized milk farmers we are referring to a farmer that produces less than 24 liters of raw milk per day, a level of production that expressed in cash income terms will create the necessity to look for other income-generating activities. Besides, it is very important to note that small and micro producers do not conduct their economic activities following a business approach. In general, micro and small farmers in Cochabamba follow a subsistence economy that is disconnected from economic concepts such as costs, profit maximization, and efficiency⁶⁴.

Milk farmers: Long-term financial sources

The items taken into account as long-term capital of producers are the cattle, reproducers, buildings, machinery, equipment, and vehicles. The possession of machinery, equipment, and vehicles tends to be a more a feature of medium and large-sized producers. In the case of machinery and equipment, approximately 60% of the respondents use their own machinery and equipment. As for vehicles, only around 25% of the respondents have this facility. Often micro and small producers rent some specific machinery or equipment only when they really need it. Apart from that, the micro and small farmers' own equipment and machinery is limited to some basic work utensils. This fact is consistent with the labor-intensive and traditional methods that characterize most of the farming activities in the country.

Table 4.4 specifies the sources of finance for long-term capital. In the case of small and micro-sized farms, the financing of investment is mainly provided by self-finance. This fact is consistent with the international evidence (Beck et al., 2008a) revealing that small business around the developing world finance only around 20% of their investments with external funds. However, this situation does not mean that micro and small milk farmers can afford to buy equipment, machinery, cattle, and other investment items. On the contrary, it is a signal that self-finance is constraining the adoption of better technology and productivity growth. This is reflected in the traditional practices and the labor-intensive activities that characterize much of the milk farmer sector in Cochabamba.

Supporting international evidence on the finance of investment in developing countries (Beck et al., 2008a), it seems that the use of external finance and the number of finance alternatives increases in relation to the size of the firms. However, we did not find evidence that small and medium firms use significantly more semiformal and informal finance than large firms. As expected, among the large producers investigated external financing prevails, both from formal financial institutions (banks) and semiformal ones (NGOs, closed credit unions, supplier credit, and the associations).

Considering that milk farmer associations provide credits in kind and in cash mainly with funds obtained as loans from financial intermediaries (i.e. banks) that are collateralized by the large processor, we found that small, medium, and even large milk farmers are financing part of long-term capital by means of this indirect value chain finance mechanism. Under the indirect value chain finance, the contract between the producers and the large processor (regarding the selling of raw milk) triggers and expands the creditworthiness of milk farmers. In the case of small and medium farmers, this indirect mechanism of value chain finance is one of the very few and perhaps the only alternative for external finance. However, it is manifest that these funds extended to the farmer association through the collateral of the large firm are limited and that they do not cover all the demands of milk farmers in terms of long-term capital necessities.

⁶⁴ That means that mainly micro and small-sized farmers do not perform their economic activities under the logic of a business. The goal for them is more to generate incomes that allowed them to subsist even in some cases far from the concepts of cost and profit. For example many of them are not considering as part of their costs the depreciation of their tools or the labor cost (since most labor is done by family members). However, there is the possibility that some of these milk farmers, particularly the ones who are members of an association, have changed toward a business mentality. This change seems associated with the entrance of the multinational enterprise in the sector. Based on interviews with these actors and the head officer of the main milk farmer association, we were able to verify that milk farmers were aware of the necessity to increase their productivity levels. That is why many of them in recent years may have improved the quality of their cattle and many aspects of the taking care of the cattle (i.e. feeding, vaccination).

The case of large milk farmers is different, since besides the alternative of indirect value chain finance they have other external financing alternatives completely outside of the value chain, such as banks, closed credit unions, and NGOs. Since they are creditworthy, their chances to access finance are much higher than in the case of micro, small, and medium-sized milk farmers.

Table 4.4. Long-term sources of finance according to size of milk farmers (in %)

Item	Size			
	Micro	Small	Medium	Large
Cattle	Own resources (100%)	Own resources (75%) NGOs (25%)	Own resources (100%)	Own resources (35.7%) NGOs (28.7%) Banks (21.4%) Closed credit union (7.1%) Association (7.1%)
Reproducers	Own resources (100%)	Own resources (80%) Association (20%)	Own resources (50%) Association (50%)	Own resources (50%) Association (50%)
Buildings	Own resources (100%)	Own Resources (100%)	Own Resources (50%) Familiar (50%)	Own resources (100%)
Machinery and equipment	Own resources (100%)	Own resources (85.7%) Association (14.3%)	Own resources (50%) Friends (50%)	Own resources (50%) NGOs (20%) Supplier (20%) Banks (10%)
Vehicles	Own resources (100%)	No data	Own resources (100%)	Own resources (60%) Banks (20%) Supplier (20%)

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

Milk farmers: Short-term financial sources

Among the items considered as short-term capital we can take into account principally the inputs used for the production of milk, which are mainly related with cattle care and conservation. Among these inputs are seeds for feeding, insecticides, fertilizer, fodder, corn, and alfalfa, purees, balanced food, soya peel, cottonseed, sanitary vaccinations, parasiticides, vitamins, and other materials⁶⁵ needed for the production of raw milk.

Again, the role of the farmer associations is important in supplying food for the cattle and other inputs that are necessary for the production of raw milk. Since 2000, this input supply has been financed by short-term credits granted by formal financial intermediaries and accomplished with the guarantee of the largest processor. These credits in kind or in cash are paid back by the producers to the association by way of a direct systematic discount done on the money transferences that the large processor makes biweekly as payment for the raw milk that producers provide to the processor. Near the date of the biweekly payment, the associations hand the large processor a report about the credits obtained by members. Then the large processor acts as a "retention agent," discounting systematically the equivalent of the credits and other services that the producers acquire from the association. Then there is no chance that milk farmers can change the use of the funds. Perhaps this is the main reason why the financial intermediary does not establish a direct relationship with the farmer. The transaction costs and risks for the financial institution relating to the payback of these credits are lower due to having the associations as intermediaries. This is a typical advantage of the financial services supplied by means of the value chain.

However, it is important to mention that not all the facilities that associations provide to their members are financed by means of commercial credits supported by the large firm. In this sense, we have to consider that by means of direct discounts executed by the large processor, all the members transfer to the association 2% of their monthly milk sales. This monthly contribution makes possible all

⁶⁵ Among the main materials used for milk production are cans, buckets, etc.

the administrative functioning of the association and also permits the financing of some services that they sell to members and non-members, such as cattle vaccination, artificial insemination, laboratory tests, and others. These services can be paid for in cash by associates and non-associates alike. For associates there is the option of trade credit that is paid by direct discounts from the processor payments, in the same way as credits for cattle food and inputs. Other services such as training and technical assistance usually do not have costs for members, and capacitation modules often benefit non-members farmers as well. This type of finance coming from the same actors of the value chain is a direct value chain finance mechanism.

Additionally, another direct value chain finance alternative for the milk farmers is provided by the large processor. As we can observe in Table 4.5, some of the micro and small-sized farmers we interviewed acknowledged that some materials are directly supplied by the processor. In addition, the large and medium-sized processors supply technical assistance and training to their raw milk suppliers in general.

Table 4.5. Sources of short-term finance according to size of farmers (in %)

Items	Size			
	Micro	Small	Medium	Large
Herd Feed	Own resources (100%)	Own resources (60%) Association (40%)	Own resources (100%)	Own resources (71.4%) Association (28.6%)
Supplementary balanced food/soya peels/cottonseed	Own resources (80%) Association (20%)	Own resources (60%) Supplier (40%)	Own resources (55%) Supplier (45%)	Association (30.7%) Own resources (23.1%) Banks (23.1%) Particulars (15.4%) Supplier (7.7%)
Materials	Own resources (58.3%) Plant (41.7%)	Own resources (50%) Plant (50%)	Own resources (66.7%) Supplier (33.3%)	Association (50%) Own resources (25%) Banks (12.5%) Supplier (12.5%)
Sanitary inputs	Own resources (71.4%) Association (28.6%)	Own resources (50%) Association (50%)	Association (66.7%) Own resources (33.3%)	Association (83.3%) Own resources (16.7%)

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

In the case of medium and large milk farmers, besides the availability of the direct and indirect value chain finance mechanisms (i.e. trade credit of suppliers, association's credits), there are also financial options outside of the value chain. Table 4.5 shows large farmers financing short-term necessities by means of formal financial institutions.

Milk farmers: Characteristics of current credit

The conditions and characteristics of current credit according to size of the milk farmers are presented in Table 4.6. Of the milk farmers interviewed, 65% are holding a credit; therefore the analysis is limited to this percentage. These farmers, independently of their size, use both formal and informal financial sources. There is no evidence that micro and small milk farmers use significantly more informal external finance. This finding is consistent with the international evidence that concludes that informal finance could not be considered as a substitute for formal finance.

In terms of the characteristics of the credits held currently by milk farmers, the amount of credit conferred to micro milk farmers is less than 200 USD; the small ones receive from less than 200 USD to 10,000 USD; the medium up to 20,000 USD and the some large ones can get even more than 30,000 USD. The amount of the credits seems related to the needs of the farmer, which is based on its size and its use of the credit (working capital or investment). Additionally, it seems that large milk farmers have more possibilities to access investment financing than the rest.

The interest rates are related to the type of the source of finance and to the use of credit. As one might expect, the interest rates for investment capital credits are generally higher than the ones for working capital. However, in general terms there is an indication that the cost of finance is higher for micro, small, and medium milk farmers than in the case of large ones. This supports the international evidence that shows that small and medium firms are not only financially constrained, but also face high costs of finance, since their projects are regarded as highly risky.

Table 4.6. Conditions and characteristics of current credit by size of milk farmers (in %)

Item	Size							
	Micro		Small		Medium		Large	
Source	Relatives Associations	(33.3%) (66.7%)	NGOs Associations	(50%) (50%)	Private financial fund Friends	(50%) (50%)	Banks Association Closed credit union NGOs	(50%) (12.5%) (12.5%) (25%)
Amount (USD)	Less than 200	(100%)	Less than 200 1,001-5,000 5,001-10,000	(50%) (25%) (25%)	1001-5,000 10001-20,000	(50%) (50%)	1,001-5,000 5,001-10,000 10,001-20,000 20,001-30,000 More than 3,000	(22.2%) (33.3%) (11.1%) (11.1%) (22.2%)
Interest rate (annual)	11-15%	(100%)	6-10 11-15	(50%) (50%)	16-20 21-30	(50%) (50%)	6-10 11-15 16-20	(22.2%) (66.7%) (11.1%)
Term (in years)	Less than 1	(100%)	Less than 1 1-4	(66.7%) (33.3%)	Less than 1 Not defined	(50%) (50%)	Less than 1 1-4 4-6	(44.4%) (22.2%) (33.4%)
Collateral	None Contractual relationship with the processor & membership	(50%) (50%)	Mortgage Contractual relationship with the processor & membership	(50%) (50%)	None Others	(50%) (50%)	Mortgage Contractual relationship with processor & membership Personal and/or group	(30%) (50%) (20%)
Use	Working capital Other uses	(66.7%) (33.3%)	Working capital Investment capital	(50%) (50%)	Working capital Investment capital	(50%) (50%)	Working capital Investment capital Other uses	(22.2%) (66.7%) (11.1%)
Other Conditions	Continuity in production		Plan of payments Project planning Continuity in production				Continuity in production Registers	

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

In terms of collateral, we can see that most of the credit that is not coming from value chain finance mechanisms is supported by mortgage. In this sense, in traditional finance the demand for mortgage as collateral could be regarded as an important constraint to credit access. Another type of collateral linked to finance outside the chain is the personal, which implies the warranty of third persons who would assume the debt in the case that the debtor fails. Therefore, it is not a coincidence that the micro and small-sized milk farmers have credits mainly from their farmer associations and informal sources such as friends or relatives. The credit from associations is a form of indirect value chain finance, and the informal sources are usually external to the value chain.

Milk farmers: Principal problems accessing finance

The micro and small milk farmers interviewed pointed out as principal problems the interest rate, the guarantees and the fear of becoming indebted, which can be interpreted as risk aversion. The medium-sized farmers mentioned the short time frames of the credits, and large producers referred to the lack of lines of credit for the dairy and agricultural sector, the high interest rates, and the availability of collateral. The common problems for all farmers seem to be the high interest rate and guarantees. This is consistent with the fact that rural and farming activities face important finance constraints in developing countries. Therefore, the necessity arises to look for and strengthen alternative mechanisms such as value chain finance.

4.5.5.2 Processor segment

The beginning of the dairy industry in Bolivia and Cochabamba dates back to the 1960s and coincides with the start of the only processor in the region that is considered as large-sized. Therefore, the large industrial processor has a relatively long experience in the sector. Also, more than 80% of the raw milk

is processed by this processor, with the rest done by other industrial processors who have carried out activities in the sector for 2 to 15 years and can all (excepting the case of a cooperative firm) be regarded as small-sized. Additionally, we must recognize the existence of non-industrial processors that produce cheese and yogurt by artisanal methods. This last group of artisanal processors falls under the category of micro-sized processors, and there are many of them. Plus, given the quantity and geographical spread of micro-sized processors, case studies from Punata, Carrasco, and Quillacollo have been taken into account in this analysis. All processors⁶⁶ except the micro-sized processors have dairy processing as their principal activity. The majority of these types of processors are also milk farmers.

Differences between the mechanisms of finance used by processors can be identified using the variable size⁶⁷. Therefore, based on international evidence on access to finance for small and medium firms, we could already expect that in the case of the dairy chain in Cochabamba; micro, small, and even medium-sized processors would be limited in their access to finance.

Another aspect that could have an impact in terms of industrial processor financing is the juridical organization of the processors. In these terms, only the medium and the large processor have certain financing advantages derived from their juridical status. The medium-sized one is a cooperative and the unique large processor is an Anonymous Society (S.A.), which makes it eligible to participate in even the securities market.

Processors: Long-term financial sources

When we refer to long-term capital, we principally refer to buildings, machinery, equipment, and vehicles⁶⁸. Next, the sources of finance for each long-term capital item are identified.

Vehicles are mainly acquired using the processor's own resources. The use of formal institutions (credit unions and banks), credit from suppliers (trade credit), and donations is less frequent. Machinery and equipment are bought mainly using the processor's own resources. However, in the case of some micro and small processors, and including the medium and large processors, donations and external credit have been important sources of finance.

The large processor in this case has a variety of equipment, according to the considerable variety of products that are produced. A significant part of the equipment and machinery is of European origin, which dates back to the foundation of the plant, when the initial machinery was donated by UNICEF. Later acquisitions were financed with Danish⁶⁹ credits, under the condition to buy Danish equipment. The majority of this Danish equipment was what the company had (being state-owned) at the time it was privatized in 1996. After the foreign privatization of the firm, major investments were made in machinery and equipment, giving rise to the introduction of a higher variety of dairy products.

It was precisely 36 years after its creation, in 1996, that the large firm made a qualitative leap by means of its privatization. The consortium Gloria S.A. from Peru bought in 1996 the industrial plants of PIL from La Paz and Cochabamba, and after 3 years it also bought the PIL plant in Santa Cruz. In 2004

⁶⁶ We also considered the case of two small processors that are vertically integrated. They have their own farms for the production of raw milk.

⁶⁷ The size of the producers is determined by the number of employees: micro have 1-4 workers, small 5-14, medium 15-49, and finally, large companies have more than 49 employees.

⁶⁸ It is important to consider that a high percentage of the micro-sized processors do not have vehicles, and that machinery and equipment are not such important items given the artisanal nature of their production.

⁶⁹ According to Socimer (1995), in the case of the large processor, these external credits were actually a donation, since these have been forgiven. "[T]he plant had a capacity of 40,000 ltrs/day and started its operations with a volume of approximately 1,600 liters of milk per day. In 1974, it received renovated industrial equipment as a part of the Danish credit aimed at developing the Bolivian industry. The operational capacity of the plant increased to 120,000 liters/day. The third and fourth Danish credits of 1977 and 1978 were spent on the acquisition of additional equipment to produce instant milk powder. The company received a fifth Danish credit in 1984 that was used to acquire auxiliary equipment and parts. Finally, the Danish credit of 1990 was used for the acquisition of a machine to package the milk in plastic bags" (Socimer 1995:47) [Author's own translation from original Spanish].

the consortium merged their three firms and together formed PIL Andina S.A., which is the national leader in the industrialization of dairy products. In terms of the national market, this large processor covers around 85% of the entire dairy market (SENASAG, 2012).

The case of the medium-sized processor is also particular⁷⁰, since being established as a cooperative, it has its own closed credit union as well. Both the processing plant and the credit union have independent management; however, decisions about market expansion, production, and investment are made by the credit union administration. The plant manager reports on topics related to the plant, but the members of the credit union make the decisions. The credit union uses the resources of its members and external resources, mainly international, such as the Interamerican Development Bank (IDB) and the Japanese government. These last funds are the most important at the moment for making long-term investments.

Additionally, in the case of the medium-sized processor, the decision-making process involves both the processor and the milk farmers. The fact that the credit union has as members the same producers of raw milk who deliver their product to the plant gives them the possibility to access finance by means of the credit union. Therefore, if for example the credits provided to milk farmers lead to an increase in their production and consequently higher amounts of milk to be sold to the plant, it is likely that this situation will have an effect on the plant's production and its needs for finance.

In the case of micro artisanal and small industrial processors, most of the investment is financed with their own resources. However, in the case of some small industrial processors we could show evidence of the use of trade credit and conventional credit coming from financial intermediaries.

Processors: Short-term financial sources

Among the items considered as short-term capital (raw milk, inputs, materials⁷¹ and labor), raw milk is most important. All processors except the two small ones that are vertically integrated and the micro artisanal processors buy the raw milk under the figure of trade credits. Usually the processor pays for the raw milk 2 weeks after collecting or receiving it. Artisanal micro processors treat manually the raw milk that cannot be sold to industrial plants. Therefore, for the cases of small, medium, and large processors, supplier credit is the main signal of direct value chain finance.

Table 4.7. Short-term finance sources by size of the processors (in %)

Item	Size					
	Micro	Small	Medium	Large		
Raw material (milk)	Own resources (100%)	Supplier (100%)	Supplier (100%)	Supplier (100%)		
Inputs and materials	Own resources (100%)	Own resources (75%) Supplier (25%)	Own resources (50%) Supplier (50%)	Own resources (50%) Supplier (50%)		

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

Regarding the financing of other inputs and materials, for all the processors except the micro the alternative of supplier credit is available. Since these inputs and materials are not products of the dairy chain, the providers of these inputs and materials are actors outside of the dairy value chain.

⁷⁰ "(...) since the year 1997 a part of the machinery was acquired with credit of the BID, using a public calling for a total value of USD 200,000, including the 3 tanks, 2 packagers, one pasteurization machine, one receiving tank, and 2 trucks. The other equipment such as laboratorial, bucket cleaners, first aid equipment, and 2 small vehicles with a value of USD 180,000 were acquired using the credit union's own funds" (Eterovic 2004:38.) [Author's own translation from original Spanish].

⁷¹ The inputs with a major impact on the costs of production are color and flavor agents, ferments, sugar, and others. Materials include packing, detergent, etc.

Processors: Conditions and characteristics of current credit

As noted in Table 4.8, a majority of the processors interviewed hold a credit, including a high percentage of the micro-sized processors. The medium and large processors use formal sources of finance that are neither direct nor indirect value chain finance mechanisms. This is evident in the case of the large processor, which has a high capacity of payment and guarantees.

Some micro and small processors are also using the financial services supplied by formal financial institutions (banks and private financial funds), but additionally they are holding credits granted by semiformal financial institutions such as NGOs and closed credit unions. Most of the intermediaries that provide credit to micro and small processors are microfinance institutions. Also, in the case of the micro-sized processors we could also identify finance coming through the value chain in the form of the credits extended by farmer associations. This is to be expected, since most micro-sized processors are also milk farmers. So given their status as farmer associates, they can request credits in cash from the association and probably use this money to finance their processing activities⁷².

Table 4.8. Conditions and characteristics of current credit by size of the processors (in %)

Item	Size							
	Micro		Small		Medium		Large	
Holding of credit	Yes	(60%)	Yes	(100%)	Yes	(100%)	Yes	(100%)
	No	(40%)						
Source	MFI banks	(20%)						
	Closed credit union	(20%)	Closed credit Union	(100%)	International institution	(100%)	Banks	(100%)
	Private fin. fund	(20%)						
	NGOs Associations	(20%) (20%)						
Amount (USD)	Less than 2,000	(60%)	2,001-5,000	(100%)	More than 50,000	(100%)	No data	
	2,001-5,000	(20%)						
	10,001-20,000	(20%)						
Interest rate (annual)	6-10	(25%)	More than 20	(100%)	Less than 5	(100%)	6-10	(100%)
	11-15	(75%)						
Term (months)	12-18	(40%)	12-18	(100%)	More than 24	(100%)	12-18	(100%)
	19-24	(40%)						
	More than 24	(20%)						
Collateral	Mortgage	(40%)	Pawn	(100%)	No data		Pawn	(100%)
	Pawn	(20%)						
	Group	(20%)						
	None	(20%)						
Use	Working capital	(60%)	Working Capital	(100%)	Working capital	(50%)	Investment capital	(100%)
	Investment capital	(40%)			Investment capital	(50%)		

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004).

The amounts of actual credit that the processors have access to fluctuates from less than 2,000 USD to more than 50,000 USD. The amounts of the credits are proportional to the size of the business, as a reflection of their capacity for indebtedness.

Regarding the cost of credits, the highest interest rates correspond to the micro and small processors, since they are seen as risky for financial intermediaries. The financial institutions – mainly from the microfinance sector – that fund these processors despite providing certain facilities in terms of collateral and other requirements compensate this flexibility with higher interest rates.

The use of credit by the medium and large processors is for investment capital, while for the micro and small processors it is working capital. The principal explanation is that for micro-sized processors the production process is essentially manual; therefore the use of capital goods is not significant. In

⁷² In the case of financial credits granted by associations, control over the use of the credit by the producer is unnecessary, since repayment is practically guaranteed by the delivery of raw milk to the association. It is obvious now that the amount of credit is related to the amount of milk delivered, which in some way reflects the capacity of payment of the agent.

addition, most of these farmer processors are far removed from a business approach. Therefore, the production of some dairy products on a small scale parallel to other agricultural and commercial activities has as a common goal simple economic subsistence. In the case of the small processors, despite the fact that the majority of them are industrial processors, it has to be taken into account that most are not using their machinery and equipment at their maximum capacity. Consequently, when a small processor wants to increase its production, it needs more working capital than investment capital. Additionally, we also consider that micro and small processors usually do not have the alternative of supplier credit to finance part of their working capital

Processors: Principal problems accessing finance

In the case of the micro-sized processors, the main problems reported in the access to finance are high interest rates, the high number and length of procedures, and the non-availability of collateral. In the case of the small and medium producers, the most frequent problems relate to collateral availability and suitable credit lines. For the small processor also, high interest rates are a problem. In the case of the large producer, the principal constraints in accessing finance are the high number and length of procedures, high interest rates, and the lack of suitable lines of credit for the sector. Thus to generalize, the non-holding of collateral is a main problem in accessing finance for micro, small, and medium-sized processors, and the high interest rate is a problem for the entire segment, from micro to large processors.

4.5.5.3 Trader segment

Also in the trader segment it is important to relate certain characteristics of the actors such as years of activity, size, and geographical location to the possibilities of external finance. Regarding the years of activity, a significant percentage (around 40%) of traders have been performing this activity for less than 4 years. Therefore if we consider that a large trajectory in the activity could be seen as a signal of creditworthiness for financial intermediaries and suppliers, we could expect that finance would be more limited for traders with less time in the activity. Additionally, the existence of relatively new agents in the trade of dairy products shows that the commercialization of dairy products has augmented significantly in the last 10 years, as the commerce activities in general have increased in the country.

Regarding the variable size⁷³, there is a predominance (91%) of micro traders in our sample. Small traders represent 6.5% of our respondents, and around 2% are medium and large-sized traders. In this last category there are wholesalers and distributors. In terms of geographical location, around 75% of the traders are located in the provinces of Cercado and Quillacollo, which are the most populated centers of the department and have the highest supply of financial services in the department. Additionally, these provinces are near the location of the large processor.

Traders: Long-term financial sources

Regarding the finance of long-term capital in this segment, the items considered are equipment and vehicles, which in the case of some traders are essential to reach clients and locations. One main aspect is to evaluate the role of the suppliers as a source of long-term finance. In the case of the medium and large traders, the weight of supplier credit is higher than for micro and small traders. This fact is consistent with previous international evidence (i.e. Demirgüç-Kunt & Maksimovic, 2001) that shows that trade credit is not used much more by small agents. It is logical that equipment suppliers would perceive less risk in transactions with large and medium-sized traders. This situation is reflected in Table 4.9, where we can observe that at least 50% of the equipment of micro and small traders is self-financed.

⁷³ The criterion used to stratify traders by size is the same as the one applied in the segment of processors.

Table 4.9. Long-term finance sources by size of traders (in %)

Item	Size				
	Micro	Small	Medium	Large	
Vehicles	Own resources	(53.8%)	Own resources (100%)	No data	No data
	Friends	(15.4%)			
	Relatives	(7.7%)			
	Others	(23.1%)			
Equipment	Own resources	(53%)	Own resources (50%) Transference (50%)	Suppliers (100%)	Suppliers (100%)
	Supplier	(26.7%)			
	Friends	(13.3%)			
	Transference	(4.4%)			
	Relatives	(2.2%)			

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

Traders: Short-term financial sources

In the analysis of short-term items, the most important are the supply of dairy products and some materials used in the trading of dairy products⁷⁴. As can be observed in Table 4.10, the use of supplier credit is important for almost all traders. However, this alternative of finance is limited for micro and small traders. In the case of materials, the supplier credit is coming from actors outside the dairy chain, while in the case of the supply of dairy products, at least for the case of dairy goods produced locally, trade credit is coming from actors who are part of the dairy chain. These actors who supply trade credit to the traders are processors but also in some cases wholesalers, distributors, and agencies who usually trade with micro and small-sized retailers. The supplier credit is not so likely to be available for micro and small retailers.

Table 4.10. Sources of short-term finance by size of the traders (in %)

Item	Size				
	Micro	Small	Medium	Large	
Materials	Supplier	(49.6%)	Own resources (62.5%) Suppliers (37.5%)	Own resources (100%)	Suppliers (100%)
	Own resources	(48.7%)			
	Relatives	(1.7%)			
Dairy products	Own resources	(58%)	Own resources (66.7%) Suppliers (33.7%)	Suppliers (100%)	Own resources (50%) Suppliers (50%)
	Supplier	(34%)			
	Relatives	(5%)			
	Others	(3%)			

Note: Value chain financial mechanisms are highlighted in bold.

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

Traders: Conditions and characteristics of current credit

Of the total of traders interviewed, about 50% have a credit. In the case of the large traders, the banks are the predominant financial source. For small and micro traders, the sources of credit are more diverse, including formal, semiformal, and even informal sources such as friends and relatives. In the case of micro-sized traders, among the formal and semiformal credit sources there is a significant presence of microfinance institutions. This situation reproduces two important characteristic of microfinance services in Bolivia: 1) the reaching of low-income people in the urban areas and 2) the tendency to finance commercial activities much more than to finance productive initiatives.

The cost of finance, expressed in the interest rate, again proves that low-income agents are the ones who face the highest financial costs. In this sense, despite the fact that microfinance offers "poor" agents the possibility to access finance, the high interest rates seem to limit the use of the services supplied by microfinance institutions. In this sense, considering that the interest rate is associated with the risk perceived by the financial intermediaries, it is evident that in the milk farmer segment financial institutions recognize much less risk in milk farmers who keep a contractual relationship with the large processor, are supported by collateral extended by the large processor, and are organized in associations, which are the link between the financial intermediary and the farmers. Additionally,

⁷⁴ Such as bags and boxes in which dairy products are packaged.

since associations take over functions of financial institutions such as credit appraisals, monitoring, and payback collection, the operational costs of credits diminish, leading to lower interest rates.

Table 4.11. Conditions and characteristics of current credit by size of traders (in %)

Item	Size						
	Micro		Small		Medium	Large	
Holding of a credit	Yes	(52.5%)	Yes	(33.3%)	n.d.	Yes	(100%)
	No	(47.5%)	No	(66.7%)			
Source	Private financial funds	(30.3%)	Banks	(50%)	n.d.	Banks	(100%)
	Banks	(24%)	Friends	(50%)			
	Open credit union	(18%)					
	Closed credit union	(6%)					
	Relatives	(9.2%)					
	NGOs	(9.2%)					
Amount (USD)	Friends	(3.3%)					
	Less than 500	(16.7%)	2,001-5,000		n.d.	More than 30,000	(100%)
	501-1,000	(23.3%)	(50%)				
	1,001-2,000	(23.3%)	5,001-10,000	(50%)			
	2,001-5,000	(30%)	(50%)				
Interest rate	10,001-30,000	(6.7%)					
	Less than 10	(4.5%)	10.5-20	(50%)	n.d.	Less than 10	(100%)
	10.5-20	(18.2%)	20.5-30	(50%)			
	20.5-30	(40.9%)					
	30.5-40	(9.1%)					
Term (in months)	More than 40.5	(27.3%)					
	1-3	(21.9%)	13-24	(100%)	n.d.	97-120	(100%)
	4-6	(12.5%)					
	7-12	(15.6%)					
	13-24	(25%)					
	25-48	(15.6%)					
Collateral	49-96	(9.4%)					
	Mortgage	(41.9%)	Mortgage	(50%)	n.d.	Mortgage	(100%)
	Personal	(41.9%)	Personal	(50%)			
	Pawn	(9.7%)					
Use	None	(6.5%)					
	Investment capital	(72.7%)	Investment capital	(100%)	n.d.	Investment capital	(100%)
	Working capital	(15.2%)					
	Other uses	(12.1%)					

Source: Author's own preparation based on IESE-Asdi/SAREC-DICYT-UMSS data (2004)

Large traders will face fewer limitations to access finance since they have mortgage as collateral. The case of micro and small traders is different, since mortgage is usually not available. Therefore, it is probable that microfinance institutions would accept other types of collateral such as pawns and personal and joint collateral at the expense of higher interest rates.

Traders: Principal problems in accessing financial markets

There are specific problems for each type of trader in accessing finance. The principal problems in accessing finance for micro and small traders are the non-availability of collateral and the high interest rates, while the large traders refer more to the number and lengthiness of procedures related to the request and grant of the credit. Therefore, this fact manifests once more that micro and small business have limited access to finance. This finance constraint seems significant despite the supply of financial services from microfinance institutions.

4.5.5.4 Consumer segment

For the identification of financial sources in the consumer segment, it is important to consider the form of payment for the dairy products. The majority of the consumers pay for their products in cash, which is logical when we consider that the buying of a dairy product does not imply large amounts of cash (at least for households). However, we have to consider the case of institutional consumers. For this last group it is likely that the option of trade credit is available. Therefore, the supplier credit serves as a clear manifestation of direct value chain finance, since the suppliers of the trade credit are actors who participate in the value chain.

4.6 Conclusions

Consistent with the international evidence, our case study shows that micro, small, and medium-sized actors who participate in the chain are finance constrained. For micro and small actors the possibilities to access external finance outside the chain seem almost nonexistent. However, value chain finance under its two modalities (direct and indirect) appears to serve as an alternative, and in some cases (i.e. micro and small-sized milk farmers) as the only way to access finance.

Despite the fact that direct value chain finance is not a new practice, many of the financial products offered along the chain (i.e. trade credit, farming contract) seem to be still very useful in providing finance to many micro/small producers and retailers. For most of these actors participating in a value chain, it is likely that value chain financial mechanisms are the only option in terms of external finance. However, both in the case of small milk farmers and retailers, these financial mechanisms inside the chain seem to be restricted to finance for short-term or working capital. Therefore, if these actors want to improve their situation, direct value chain finance might not be enough. If the goal is the upgrading (in terms of product and process) of these micro and small firms through technological innovation and productivity, a better alternative is indirect value chain finance.

Under indirect value chain finance, the lead processor serves as a third party between milk farmers – organized in associations – and financial intermediaries. The large firm extends credit letters in favor of farmer associations, collateralizing credit relationships between farmer associations and financial intermediaries. The financial institution closely observes the performance of the processor and based on this evaluation, assesses farmer creditworthiness. In this sense, it seems that if farmers want to improve their situation, it is important that they are connected to an integrated commodity chain. Participation in the chain leads to a delegated screening of borrowers. In fact, the contractual (explicit or implicit) linking between the small milk farmers and the large buyer provides lenders with a kind of “go-ahead” signal.

In this respect, more efficient indirect value chain finance would imply the necessity to strengthen the financial intermediation. This strengthening should be reflected in a more efficient and inclusive financial system, complemented by an adequate regulatory, normative, and supervisory framework.

Additionally, our case study suggests that in operative terms, milk farmer associations play a key role in both direct and indirect value chain finance. In the case of indirect finance, the associations serve as a kind of intermediary between the formal financial institutions and the farmers. The credits in kind and in cash offered by the associations to their members are conferred by formal financial intermediaries and accomplished with the guarantee of the large processor (supported by the contractual relationship with the producer and the issuing of a credit letter). In the case of direct finance, milk farmer associations make all the negotiations with input suppliers, getting more convenient prices and conditions (such as the possibility to access trade credit). Therefore, associations can supply determined inputs to their members with much better conditions than in cases where the milk farmer has to deal directly with input suppliers (in addition to the fact that milk farmers don't have to incur transaction costs).

It is important to not view value chain finance as a substitute for traditional finance or as the only alternative for improving access to finance for small, poor, and rural agents. Low-income households and agro-businesses have several needs for financial services, and we cannot expect that value chain finance would address all those needs.

The case of the dairy chain in Cochabamba seems to fit into the category of producer-driven and directed captive governance, in terms of the relationships between milk farmers and the big processor. Therefore, with the purpose of ensuring a consistent, reliable, and adequate supply, the large firm may be motivated not only to require product specifications, but also to embed services such as technical assistance, training, and finance as a way to guarantee those product requisites.

Finance can be an incentive for contracts that ensure supply, as well as funding the working capital that a producer needs to upgrade a product to meet the standards required by the lead firm or processor. However, it is worth considering that if value chain finance focuses more on working capital than on investment, it would only incentivize product upgrading and would limit process upgrading.

In this respect, although under directed governance the generation of direct value chain finance is more likely, we found important evidence about the presence of indirect value chain finance under the figure of the farmer association providing diverse types of credits. As the literature established, this type of value chain finance could lead to long-term finance and therefore could have a positive impact in terms of technological innovation and production. Consequently, it could lead to upgrading in terms of process and for the entire value chain.

Value chain finance seems critical to enable low-income, particularly rural and farmer agents to start and expand their economic activities and to help them to increase their income sustainability. Therefore, financial intermediaries would benefit from taking a value chain approach. Traditional financial institutions offer a fixed set of loans without regard for the fact that agents are often part of a value chain. In this sense, financial intermediaries should understand that the risk associated with a particular actor (i.e. small producer) can be estimated by understanding the risks and the competitiveness of the whole chain in which the agent is participating.

The successful case of the foreign-owned large processor of dairy products at the regional and national level might be taken as evidence that foreign direct investment can have positive horizontal and vertical spillover effects not only on the economy in terms of products, employment, technological innovation, and efficiency, but also in terms of promoting alternative mechanisms of finance for micro, small, and medium-sized agents/firms as in the case of value chain finance.

The provision of value chain credit facilities requires specialist skills and in-depth knowledge about determined actors in order to reduce adverse selection and moral hazard. Along this line, transferring loan funds to the milk farmers through farmer associations could be useful since such associations could use the most appropriate mechanisms to enforce loan compliance among their own members. In this sense, it seems that one of the best ways to intervene in the value chain is through these organizations encouraging or making compulsory the participation of all farmers and in general small-sized actors in this type of cooperative institution (cluster). However, there is still the challenge of ensuring efficient associations, since the act of being a member of an association by itself does not always mean that members will have benefits.

Other ways of direct intervention in a value chain in order to improve financial access for determined small, rural, or poor actors do not seem recommendable, since the results are not necessary what one would expect. In fact, our value chain study case clearly shows that government, non-government, and international cooperation initiatives taken to inject funds in a determined chain segment (mainly the farmer and processor segments) did not have the expected results. There is a strong probability that the actors benefitting from the funds mismanage these resources since they see them as “grants” and not as obligations. Therefore, there is a strong probability of incurring adverse selection and moral hazard. Additionally, there is also the risk that government interventions may be biased by political and other non-efficiency considerations when allocating the resources.

The financial characteristics of the actors/firms involved in the different segments of the dairy value chain in Cochabamba seem to be consistent with the existing literature regarding international patterns of financing for small and medium-sized firms. Apparently, larger, older, and foreign-owned firms face less financial constraints, as is the case of the large dairy processor in our value chain case study. Additionally, the most innovative actors in the chain seem to be those who have more access to external finance (industrial dairy processors) and foreign direct investment participation (the large foreign-owned processor). Trade credit and other forms of informal finance appear as alternative

finance mechanisms; however, we should consider that they are far from serving as substitutes for formal finance. While most of the short and long-term capital of micro and small producers is self-financed, we should realize that self-finance limits specialization, adoption of better technology, and productivity growth in the sector as well as in the economy overall.

References

- Andreas, S-H. (ed.) 2007. Value Links manual: The methodology of value chain promotion. Eschborn, Germany: GTZ.
- Andrews, M. (2006). *Microcredit and Agriculture: How to make it work*. MEDA - Canada.
- Angulo, J. (2007). Estudios de caso para el análisis del financiamiento de cadenas de valor. *Serie de Publicaciones RUTA - Documentos de Trabajo*, No. 26.
- Angulo, J., & Junkin, R. (2009). *Guía para el desarrollo de estrategias de financiamiento en cadenas de valor*. San José, Costa Rica: Programa de Competitividad y Cadenas del Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) – Unidad Regional de Asistencia Técnica (RUTA).
- Appelbaum, R. (2004). Commodity chains and economic development: One and a half proposals for spatially-oriented research. *Center for Global Studies - Working Papers*, 01, UCSB.
- Aryeetey, E., & Udry, C. (1995). *The characteristics of informal financial markets in Africa*. University of Ghana Department of Economics, October 1995.
- Asociación de Entidades Microfinancieras [ASOFIN] (2012). *Memoria anual 2011: Un año de profundización de las microfinanzas*. La Paz, Bolivia: ASOFIN.
- Autoridad de Fiscalización y Control Social de Empresas [AEMP] (2012). *Cadena Productiva de la Leche*. La Paz, Bolivia.
- Ayyagari, M., Beck, T., & Demirgüç-Kunt, A. (2007a). Small and medium enterprises across the globe. *Small Business Economics*, 29(1), 415-434.
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2007b). Firm innovation in emerging market. *World Bank Policy Research Working Papers*, No. 4157.
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Formal versus informal finance: evidence from China. *World Bank Policy Research Working Papers*, No. 4465.
- Azam, J.P., Biais, B., Dia, M., & Maurel, C.M. (2001). Informal and formal credit markets and credit rationing in Cote d'Ivoire. *Oxford review of economic policy*, 17(4), 520-534.
- Becchetti, L., & Trovato, G. (2002). The determinants of growth for small and medium sized firms: The role of the availability of external finance. *Small Business Economics*, 19, 291–306.
- Beck, T., Demirgüç-Kunt, A., Laeven, L. & Levine, R. (2004). Finance, firm size, and growth. *NBRE Working Papers*, No. 10983.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and Legal Constraints to Growth: Does Firm Size Matter? *The Journal of Finance*, 60(1), 137-177.
- Beck, T., & Demirgüç-Kunt, A. (2006a). Small and medium-size enterprises: Access to finance as a growth constraint. *Journal of Banking and Finance*, 30(11), 2931-2943.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2006b). The influence of financial and legal institutions on firm size. *Journal of Banking and Finance*, 30(11), 2995-3015.
- Beck, T. (2007). *Financing constraints of SMEs in developing countries: Evidence, determinants and solutions*. Draft: May 2007. Retrieved <http://arno.uvt.nl/show.cgi?fid=95654>.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008a). Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, 89(3), 467-487.
- Beck, T., Demirgüç-Kunt, A., & Honohan, P. (2008b). *Finance for all? Policies and pitfalls in expanding access*. Washington, D.C.: The World Bank.
- Beck, T., Demirgüç-Kunt, A. & Martinez, M. S. (2009). Bank financing for SMEs around the world: Drivers, obstacles, business models, and lending practices. *Access Finance Newsletters*, No. 26.
- Beggs, M. (2010). *Value chain finance in Zambia: Supply chain solutions to financial constraints*. USAID –PROFIT.
- Bengtsson, N. & Pettersson, J. (2012). *The outreach and sustainability of microfinance: Is there a tradeoff?* Uppsala Center for Labor Studies - Department of Economics. Working Paper 2012:18.
- Biais, B., & Gollier, C. (1997). Trade credit and credit rationing. *The Review of Financial Studies*, 10(4), 903–937.

- Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J.W., ... Zeufack, A. (2000). Credit constraints in manufacturing enterprises in Africa, WPS/2000.24. Retrieved from: <http://www.csaee.ox.ac.uk/workingpapers/pdfs/20-24text.pdf>.
- Caves, R. (2007). *Multinational enterprise and economic analysis* [3rd Edition]. Harvard University: Cambridge University Press.
- Comisión Económica para América Latina [CEPAL]. (2000). *De cara a la globalización: Organizaciones sociales en América Latina: Pequeños productores lecheros en Cochabamba*, Bolivia, Working Paper.
- Chavis, L., Klapper, L., & Love, I. (2010). International differences in entrepreneurial finance. *World Bank - Enterprise Survey and Note Series, Note No. 11*.
- Class & Asociados (2012). *Gloria S.A: Fundamento de clasificación de riesgo*. Información financiera auditada a Diciembre de 2011. Lima, Peru. Retrieved <http://www.classrating.com/Gloria.pdf>.
- Class & Asociados (2013). *Gloria S.A: Fundamento de clasificación de riesgo*. Información financiera auditada a Diciembre de 2012. Lima, Peru. Retrieved from <http://www.classrating.com/Gloria.pdf>.
- Coates, M., Kitchen, R., Keibell, G., Vignon, K., Guillemain, C., & Hofmeister, R. (2011). Financing agricultural value chains in Africa: A synthesis of four country case studies. Making finance work for Africa. Eschborn - Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ].
- Coon, J., Campion, A., & Wenner, M. (2010). Financing Agriculture Value Chains in Central America. Washington – USA: Inter-American Development Bank.
- Cypher, J., & Dietz, J. (1997). Transnational corporations and economic development. In *The process of economic development* (p. 430-463). London: Routledge.
- Da Silva, C. (2005). *The growing role of contract farming in agri-food systems development: Drivers: Theory and practice*. Rome, Italy: FAO.
- Demirgüç-Kunt, A. (2010a). Can informal finance substitute for formal finance? *All about Finance*, World Bank blog.
- Demirgüç-Kunt, A. (2010b). Can the business environment explain international differences in entrepreneurial finance? *All about finance*, World Bank blog.
- Demirgüç-Kunt, A., & Maksimovic, V. (2001). *Firms as financial intermediaries: Evidence from trade credit data*. World Bank Policy Research Working Papers, No. 2696.
- Dunn, E., Sebstad, J., Batzdorff, L., & Parsons, H. (2006). Lesson learned on MSE upgrading in value chains: A synthesis paper. Micro-report No. 71. Accelerated Microenterprise Advancement Project Business Development Services Knowledge and Practice Task Order - USAID.
- Durlauf, S.N., & Fafchamps, M. (2005). Social Capital. In P. Aghion & S. Durlauf (Eds.), *Handbook of Economic Growth* (Chapter 26). Elsevier.
- Fanelli, J. M., Bebczuk, R. & Pradelli, J. (2002). Determinants and consequences of financial constraints facing firms in Argentina. *Research Network Working Paper* No. 453. Inter-American Development Bank.
- Fanelli, J., & Medhora, R. (2002). *Finance and Competitiveness in Developing Countries*. London & New York: Routledge Studies in Developing Countries.
- Feddes, J. (2004). *Milk: The white engine for the economy of Cochabamba?* (Unpublished Master thesis dissertation). Tilburg University.
- Asociación de Instituciones Financieras para el Desarrollo Rural [FINRURAL] (2013). Estadísticas Financieras 2012. La Paz – Bolivia: FINRURAL.
- Fitch Ratings (2012). Pil Andina S.A. (PIL): Calificación de Riesgo 2011.
- Food and Agriculture Organization of the United Nations [FAO] – Ministerio de Asuntos Campesinos y Agropecuarios [MACA] (2004). *Identificación, mapeo y análisis competitivo de la cadena productiva de leche de origen bovino y productos lácteos*. La Paz, Bolivia.
- Fundación para el Desarrollo Productivo y Financiero [PROFIN] (2009). *Diagnostico servicios financieros* (Executive Summary). La Paz, Bolivia: PROFIN-COSUDE.
- Fries, R. & Akin, B. (2004). Value chains and their significance for addressing the rural finance challenge. *Micro-Report* No. 20. Accelerated Microenterprise Advancement Project – USAID.
- Galindo, A., & Schiantarelli, F. (2002). Credit constraints in Latin America: An overview of the micro evidence. *Research Network Working Paper* No. 472. Inter - American Development Bank.
- Galvez, E. (2006). Financiación de la comercialización Agrícola en América Latina. Roma: FAO.

- Gereffi, G., & Korzeniewicz, M. (1994). *Commodity Chains and Global Capitalism*. Westport-Connecticut-London: Ed. Praeger.
- Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain. *Journal of International Economics*, 48.
- Gereffi, G. (2001). Las Cadenas productivas como marco analítico para la Globalización," *Problemas del Desarrollo*, 32:125, IIEc, UNAM, México.
- Gibbon, P. (2000). Global Commodity Chains and Economic Upgrading in Less Developed Countries. *Center for Development Research (CDR) - Working Paper 00.2*. Copenhagen, Denmark.
- Gibbon, P. & Ponte, S. (2005). Quality standards, conventions and the governance of global value chains. *Economy and Society*, 34, 1-31.
- Gibbon, P., Bair, J., & Ponte, S. (2008). Governing global value chains: An introduction. *Economy and Society*, 37(3), 315-338.
- Gibbon, P., & Raikes, P. (2000). Globalisation and African export crop agriculture. *Journal of Peasant Studies*, 27(2). 50-93.
- Gorodnichenko, Y., Svejnar, J., & Terrell, K. (2007). When does FDI have positive spillovers? Evidence from 17 emerging market economies. *Discussion Paper Series*, No. 3079. *Institute for the Study of Labor*.
- Greenwood, J., & Jonanovic, B. (1989). Financial Development, growth and the distribution of income. *NBER Working papers*, No. 3189.
- Guiso, L., Sapienza, P., & Zingales, L. (2000). The role of social capital in financial capital. *NBER Working Papers*, No. 7563.
- Habyalimana, S. (2007). *Access to finance through value chains: Lessons from Rwanda*, AEGIS European conference on African studies. Leiden, The Netherlands.
- Hansel, J. (2007). Risk-sharing models increase market access and financial and non-financial services to farmers. *Enterprise Development and Microfinance*, 18(2&3), 109-125.
- Harper, M. (2005). *Farm credit and microfinance: is there a critical mismatch?* Rural Finance Learning Centre.
- Hartwich, F., Devlin, J., Kormawa, P., Bisallah, I.D., Odufote, B.O. & Polycarp, I.M. (2010). *Unleashing agricultural development in Nigeria through value chain financing*. Working Paper. United Nations, Central Bank of Nigeria, Bank of Industry.
- Helanterä, A. (2003). *The agro-food sector of the Ukraine: Analysis of transition by means of the global commodity chain approach* (Interim Report). Austria: International Institute for Applied Systems Analysis.
- Hess, M. (2008). Governance, value chains and networks: An afterword. *Economy and Society*, 37(3), 452-459.
- Hill, C. (2010). The political economy of foreign direct investment. In *International Business: Competing in the Global Market Place* [5th Ed.] (Chapter 8). New York: McGraw-Hill.
- Humphrey, J. (2006). *Global value chains in the agrifood sector*. Institute of Development Studies. United Kingdom: University of Sussex, Brighton - UNIDO.
- Humphrey, J. & Memedovic, O. (2006). *Global value chains in the agrifood sector*. Viena: UNIDO.
- IESE-Asdi/SAREC-DICYT-UMSS (2004). *The Economic and Environmental Competitiveness for the Agro-industrial Dairy Chain in Bolivia*. Datasets. Research Project. Universidad Mayor de San Simon [UMSS]. Cochabamba, Bolivia.
- Inter-American Development Bank [IDB]. (2005). *Unlocking credit: The quest for deep and stable bank lending*. Report 2005 on Economic and Social Progress in Latin America. Washington D.C.: IADB.
- Instituto Nacional de Estadística [INE] (2012). *Estadísticas monetarias y financieras*. La Paz, Bolivia.
- Johnston, C. & Meyer, R.L. (2008). Value chain governance and access to finance: Maize, sugar cane and sunflower oil in Uganda. *Small enterprise development*, 19(4), 281-300.
- Johnston, C., Meyer, R. & Curtis, A. (2010). Value chain governance and access to finance: Maize, sugar cane and sunflower oil in Uganda. *USAID - MicroReport No. 88*.
- Kaplinsky, R., & Morris, M. (2000). *A Handbook for Value Chain Research*. IDRC. Retrieved from: <http://www.prism.uct.ac.za/Papers/VchNov01.pdf>.
- Keane, J. (2008). A new approach to global value chain analysis. *Overseas Development Institute - Working Papers*, No. 293. London.
- Kohpaiboon, A. (2009). *Vertical and horizontal FDI technology spillovers: Evidence from Thai manufacturing*. Faculty of Economics, Thammasat University. Bangkok, Thailand. Retrieved from <http://www.eria.org/ERIA-DP-2009-08.pdf>.

- Kumar, A. (2008). Value chain finance to develop the honey sub-sector in India. *Enterprise Development and Microfinance*, 19(4), 317-330.
- Lapavistas, C. (2007). Information and trust as social aspects of credit. *Economy and Society*, 36(3), 416-436.
- Levenson, A., & Besley, T. (1996). The anatomy of an informal financial market: Rosca participation in Taiwan. *Journal of development economics*, 51(1), 45-68.
- Love, I., & Mylenko, N. (2003). Credit reporting and financing constraints. *World Bank Policy Research Working Papers*, No. 3142.
- Ministerio de Asuntos Campesinos y Agropecuarios [MACA] (2004). *Identificación, mapeo y análisis competitivo de la cadena lechera de origen bovino y productos lácteos*. La Paz, Bolivia: MACA.
- Mac-Cormick, D., & Schmitz, H. (2002). *Manual for value chain research in the garment industry*. England: Institute of Development Studies, University of Sussex.
- McGrath, R., & Sparks, W. (2005). The importance of building social capital. *Quality progress*, February 2005, 45-49.
- Mensink, M., & de la Rive Box, J. (2011). *How to support value chain finance in a smart way?* European Microfinance Platform. Luxembourg: European Microfinance Platform [e-MFP].
- Meyer, J. (2003). *Understanding the determinants of vibrant business development: The systemic competitiveness perspective (First Draft)*. Duisburg. Retrieved from: http://www.meyer-stamer.de/2003/Systemic_WIRAM.pdf.
- Meyer, R. (2007). *Analyzing and financing value chains: Cutting edge developments in value chain analysis*. Paper presented at the "3rd African Microfinance Conference: New Options for Rural and Urban Africa," 20 – 23 August 2007, Kampala, Uganda.
- Milberg, W. (2008). *Shifting Sources and uses of profits: Sustaining U.S. financialization with global value chains*. Paper presented at CEPN/SCEPA Conference - University of Paris.
- Milberg, W. & Winkler, D. (2010). Financialisation and the dynamics of offshoring in the USA. *Cambridge Journal of Economics*, 34 (2), 275-293. doi: 10.1093/cje/bep061. First published online: December 3, 2009.
- Milder, B. (2008). Closing the gap: Reaching the missing middle and rural poor through value chain finance, *Enterprise Development and Microfinance*, 19(6), 1-12.
- Miller, C. (2008). "A baker's dozen lessons of value chain financing in agriculture," *Enterprise Development and Microfinance*, 19:4, pp. 273-280.
- Miller, C. (2012). *Agricultural value chain finance strategy and design*. FAO- IFAD. Retrieved from: <http://www.ifad.org/ruralfinance/pub/valuechain.pdf>.
- Miller, C., & Da Silva, C. (2007). Value chain financing in agriculture. *Enterprise Development and Microfinance*, 18(2&3), 95-107.
- Miller, C. & Jones, L. (2010). *Agricultural value chain finance: Tools and lessons*. Rome, Italy: Food and Agriculture Organization of the United Nations [FAO] and Practical Action Publishing.
- Mishkin, Frederic (2005). Is financial globalization beneficial? NBER Working Paper 11891, National Bureau of Research in Economics, Massachusetts.
- Mishra, B. (2008). Contract farming for potato: An attempt to include poor farmers in the value chain. *Enterprise Development and Microfinance*, 19(4), 331-343.
- Monge-Naranjo, A., & Hall, L. (2003). *Access to credit and the effect of credit constraints on Costa Rican manufacturing firms*. Inter-American Development Bank - Research Network Working Paper.
- Nwanna, G. (1996). *Rural financial markets in West Africa: Roles, experiences, constraints and prospects for promoting rural development*. Department of Economics, Morgan State University. Retrieved from: <http://msuweb.montclair.edu/~lehelp/CERAFRM060Nwanna1996.pdf>.
- Nimal, F. (2007). *Low-income households' access to financial services: International experience, measures for improvement, and the future*. Philippines: EARD Special Studies, Asian Development Bank.
- Pelrine, R. (2009). *Agricultural value chain financing in Kenya: Assessment of potential opportunities for growth*. USAID – Kenya Value Chain Finance Centre, Kenya.
- Peppelenbos, L. (2010). *Value chain finance: Beyond microfinance for rural entrepreneurs*. Amsterdam: KIT & IIRR. Royal Tropical Institute (Amsterdam) & International Institute of Rural Reconstruction (Nairobi).
- Pietrobelli, C., & Rabellotti, R. (2011). *Global value chains meet innovation systems: Are there learning opportunities for developing countries?* *World Development*, 39 (7), 1261–1269.

- Quiros, R. (Ed) (2007) *Agricultural value chain finance*. Proceedings of Conference I of "Agricultural Value Chain Finance." Costa Rica, 2006. San Jose, Costa Rica: FAO-Academia de Centroamerica.
- Quiros, R. (Ed.) (2011) *Agricultural value chain finance*. Proceedings of Conference II of "Agricultural Value Chain Finance." Costa Rica, 2010. San José, Costa Rica: FAO and Academia de Centroamérica.
- Ranjan, S., Duab, P., & Goldar, B. (2012). Foreign direct investment and technology spillover: Evidence across Indian manufacturing industries. *Delhi School of Economics - Working Paper No. 207*.
- Rhyne, E (2001). *How lending to the poor began, grew and came of age in Bolivia: Mainstreaming microfinance*. Kumarian Press.
- Robinson, M. (2001). *The microfinance revolution: Sustainable finance for the poor*. World Bank.
- Schimitz, H. (2005.) *Value chain analysis for policy makers and practitioners*. Geneva: International Labor Office.
- Serfati, C. (2009). *Dimensiones Financieras de la Empresa Transnacional: Cadena Global de Valor e Innovación Tecnológica*. Paris: Université de Saint-Quentin-en-Yvelines.
- Servicio Nacional de Sanidad Agropecuaria e Inocuidad Alimentaria [SENASAG] (2012). *Caracterización del sector lechero en Bolivia*. La Paz, Bolivia.
- Shepherd, A. (2007). *Approaches to linking producers to markets: A review of experiences to date*. Rome, Italy: FAO.
- SOCIMER (1995). Planta Industrializadora de leche Andina SAM. Memorando de información. La Paz, Bolivia.
- Stockhammer, E. (2010). *Financialization and the global economy*. Political Economy Research Institute, University of Massachusetts. *Working paper series, No. 240*.
- Sturgeon, T. (2001). How Do We Define Value Chains and Production Networks? *IDS Bulletin, 32(3)*, 9-18.
- Swinnen, J., & Maertens, M. (2010). *Finance through food and commodity value chains in a globalized economy*. K.U.Leuven, Belgium: LICOS Centre for Institutions and Economic Performance & Department of Economics.
- Swinnen, J., Maertens, M., & Vandeplas, A. (2010). Governance and smallholder farmer competitiveness in high value food chains. University of Leuven, Belgium.
- Tran, H., Michl, T. & Scrimgeour, D. (2011). *Financialization and its impact on investment* (prepared for Econ 490: Honors Seminar). Colgate University
- United Nations Conference on Trade and Development [UNCTAD] (2002). *Farmers and farmers: Associations in developing countries and their use of modern financial instruments*. UNCTAD/DITC/COM/35. Retrieved from: <http://128.118.178.162/eps/fin/papers/0301/0301001.pdf>
- United Nations Conference on Trade and Development [UNCTAD] (2010). *Foreign direct investment, the transfer and diffusion of technology, and sustainable development*, Prepared for the Expert Meeting on the Contribution of Foreign Direct Investment to the Transfer and Diffusion of Technology and Know-how for Sustainable Development in Developing Countries, Geneva, 16–18 February 2011.
- USAID & AMAP (2010). *Finance in value chain analysis – A synthesis paper*, USAID. MicroReport No. 132.
- Van Doorn, J., & de la Rive, J. (2009). *On linking rural financial services to producers in the context of a value chain*. Desk study, ICCO-TERRAFINA.
- Van Staveren, I., & Knorringa, P. (2006). *Social capital in economic development: How social relations matter*. Draft paper presented at seminar of the economics department of Utrecht University, 18 January 2006, ISS, The Hague, The Netherlands.
- Vildoza, D.A. & Maza, M.T. (2005). *La comercialización de la producción lechera en el valle alto de Cochabamba* (Master thesis dissertation). Universidad de Zaragoza.
- Villacorta, I., Quiroga, J.C., & Daza, U. (2003). *Censo pecuario para la promoción económica municipal: Municipio de Punata*. Cochabamba, Bolivia.
- Wenner, M., Navajas, S., Trivelli, C. & Tarazona, A. (2007). *Managing credit risk in rural financial institutions in Latin America*, IADB, Washington, D.C.
- Winker, P. (1999). Causes and effects of financing constraints at the firm level. *Small Business Economics, 12*, 69–181.
- World Bank [WB] (2005). *Rural finance innovations: Topics and case studies*. Report No. 32726-GLB. The World Bank Agriculture and Rural Development Department.
- World Bank [WB] (2012). *World development indicators*. Dataset.
- Zerai, B., & Rani, L. (2012). Is there a tradeoff between outreach and sustainability of micro finance institutions? Evidence from Indian microfinance institutions (MFIs), *European Journal of Business and Management, 4(2)*, 90-98.

Annexes

Annex 4.1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
code	2937	1599.006	1646.954	2	9469
year	2937	2004	5.888843	1998	2012
quality	2744	3.417311	.1459725	2.8	4
quant	2743	1111.581	1299.538	11	24589
creditasoc	2837	.4536482	.4979346	0	1
sharehold	2937	.9867211	.1144858	0	1
price	2937	2.042727	.8167315	1	3.2
Lnoutput	2743	6.599993	.9027719	2.397895	10.11005
Lnprice	2937	.6418208	.3694682	0	1.163151
Lnquality	2744	1.22794	.0428053	1.029619	1.386294

Source: Author's own preparation on basis of data analysis

Annex 4.2. Hausman Test: Fixed – Random effects

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
price	.3862934	.3664692	.0198242	.0028834
creditasoc	.3754303	.4409496	-.0655193	.0118992

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg
 Test: Ho: difference in coefficients not systematic

$$\text{chi2}(2) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$$

$$= 7.06$$
 Prob>chi2 = 0.0293 *So fixed effects is better than random effects*
 (V_b-V_B is not positive definite)

Source: Author's own preparation on basis of data analysis