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BANKING TECHNOLOGY TO SCALE MICROFINANCE: THE CASE OF CORRESPONDENT BANKING IN BRAZIL

*Une technologie bancaire dimensionnée pour la micro-finance : le cas du
« correspondent banking » au Brésil*

Completed Research Paper

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Abstract

Significant population segments in developing countries have very limited access to basic financial services, such as bank accounts, savings or insurance. Meanwhile, the use of ICT is increasingly becoming an intrinsic part of banking business, rendering financial services easier and cheaper to develop and deliver. This paper focuses on ICT-based correspondent banking outlets, a technology that appeared in Brazil in recent years, which is considered a feasible alternative for delivering financial services to the poor. The aim of this paper is to investigate how the use of this particular technology was structured and how it has evolved over time to deliver an increasingly complex range of services. A conceptual model, combining three theoretical approaches, is proposed to make possible an original reading of the use of correspondent banking technology in Brazil and its implications for microfinance.

Résumé

Dans les pays en voie de développement, une portion importante de la population n'a qu'un accès limité aux services financiers de base, tels que compte bancaire, épargne ou assurance. Au même moment, les technologies de l'information et de la communication (TIC) sont devenues indissociables des activités bancaires. Elles facilitent le développement et la livraison de services financiers à moindres coûts. Cet article traite du « correspondent banking », phénomène récent au Brésil, en tant qu'alternative applicable pour fournir des services financiers aux pauvres. Le but de cet article est d'étudier la structure d'utilisation de cette technologie particulière et sa façon d'évoluer pour offrir une gamme de services de plus en plus élaborée. Le modèle conceptuel proposé conjugue trois approches théoriques qui permettent une lecture originale de l'utilisation du « correspondent banking » au Brésil et de ses implications pour la microfinance.

Keywords: banking IS, computing in developing countries, finance, microfinance delivery, correspondent banking, socio-technical approach, social entities.

I. Introduction

Technology has become an intrinsic part of banking, making it easier and cheaper to develop and deliver financial services. As a consequence of the highly technological environment developed around the world in the banking industry, the expansion of distribution channels for financial services relies on a very complex network of partnerships (Costa et al. 2007; Weissbourd 2002).

At the same time, in developing countries, only part of the population has access to basic financial services, such as a deposit account, for example. A number of studies (Stegman et al. 2005; Claessens 2006; UNDP 2007) have claimed that technology will play a significant role in improving poor people's bank access, taking financial services in a sustainable way to far and underserved locations. There is a tremendous opportunity for banking technology to connect lower-income citizens at reduced costs and bring millions of consumers to the formal financial marketplace through electronic channels (Weissbourd 2002).

One of these electronic channels – ICT-based correspondent banking (CB) – has flourished in Brazil over the last few years, and started to be seen, not only in Brazil but in other countries as well, as a feasible alternative for increasing the availability of bank services (Kumar et al. 2006). Correspondent banking (CB) outlets, or correspondents, are points of service installed on a partnership basis between banks and retailers, such as supermarkets, pharmacies, lottery stores, post offices, microfinance institutions (MFI) and many other types of retail outlets. This IT-based CB model significantly reduces the costs and increases the outreach of Brazil's banking system, making it an attractive vehicle for underserved low-income populations. The model is considered unique because of its reach and scale, the quality of the services provided, and the new technological platforms that have enabled these services (Kumar et al. 2006).

Regarding our understanding of the CB phenomenon as supported by information systems and determined by its social context, this paper's intention is twofold. First it describes how the CB model is articulated, within its main social context. Second, the paper investigates the evolution of this model, developed initially to process structured financial transactions, such as bill payments and government benefits delivery, to a relationship-based channel, delivering products and services (such as microcredit, for instance) specifically to the low income market. So, this paper is based on research developed to investigate two main questions related to CB in Brazil:

- What pushed Brazil's banking sector and technology partners to develop CB to expand banking services to the poor? and
- How has this model evolved over time to include relationship-based services, traditionally more difficult to deliver via electronic channels than transactional services?

Our first challenge was of a conceptual nature: Which theoretical or conceptual model could we apply to investigate a phenomenon that is context-dependent, mixes social and financial interests, is related to the technological views of a number of social groups (banks, regulators, technology providers, retailers, MFIs, etc.) and involves a temporal dimension? Such a context demanded an original conceptual frame, which we found by combining three theoretical approaches – social shaping of technology, structurationist view of technology and contextualism.

The work presented in this paper is part of a broader investigation developed to identify how the CB technology was adopted by Brazilian banks, and how its use has evolved over time, from a purely transactional channel to a means of delivering a broader range of services, particularly relationship-based ones.

Section II of this paper describes technology's role as one of the most relevant instruments for expanding bank outreach as well as the underprivileged's access to financial services, and how the Brazilian CB model is representative of this trend. Details of the conceptual frame and methodological procedures are described in Section III. Research results and evidence are reported in Section IV. A conclusion along with comments and suggestions for further research make up Section V.

II. ICT to expand financial services outreach

II.1 The role of ICT to build inclusive financial services

Banks will aggressively target the poor as a market only if they find ways to serve these customers profitably. Because poor people haven't much money, often live in sparsely populated areas, and rarely have documented credit histories, banks have found these potential clients of little interest and too costly (Ivatury 2006). To reach such markets, it is necessary to focus on inexpensive delivery channels and to develop low-cost means of handling transactions.

Even ICT-based innovations that have allowed commercial banks to set up low-cost "electronic banking" channels, such as Internet banking and automated teller machines (ATMs), may not be largely available to the poor. Only part of the population has Internet access, and the distribution of ATMs is mostly concentrated in urban and relatively affluent areas, particularly in developing countries. However, other technologies have been more promising in helping banks to expand their operations to the poor in developing countries. This is the case of mobile phones and POS terminals.

Thanks to the speed of diffusion of mobile phones in developing countries, the estimated number of mobile phone users has already surpassed that of banked people (Porteous 2006). In fact, in developing countries, mobiles may be the only means of accessing communications services (Donner 2008). In certain African and Asian countries, mobile banking is taking off and has already become one of the "new and fast-developing spaces at the convergence of technology and financial services" (Lyman et al. 2008).

But besides mobile phones, other branchless banking approaches are gaining space as a way of reducing the cost of delivering financial services to clients beyond the reach of traditional banking. The Brazilian correspondent banking (CB) model, based on a network of POS and PC terminals available in retail stores, built on a partnership between banks and stores, and managed by dedicated service and technology integrators, has gained momentum. More about CB in Brazil will be presented in the next section, but, for now, it is important to highlight the role of technology in this model, as well as the partnership between the different sets of actors, who have come to share a common view on how this technology could be used.

Our intention here is not to address all the questions raised by the expansion of the frontier of financial access to the poor, but rather to focus on the technology. In addition to technology, other interrelated issues will determine how rapidly this banking model scales up: (a) development of successful business models that show how to profitably offer financial services to people on low incomes, (b) understanding those factors that affect customer adoption among the unbanked poor, and (c) institutional matters related to the regulatory environment of those countries where the solutions are being adopted (Lyman et al. 2008).

II.2 Correspondent banking in Brazil

Some intrinsic economic factors have hindered the distribution of financial services to low-income populations in Brazil. These include the high fixed operating costs of traditional banks, the country's continental dimensions and its heterogeneous population distribution. Meanwhile, larger retail banks must compete for a narrow share of the more affluent clients. To do so, they must make use of high level technological integration in inter- and intra-banking. In such an environment, CB offers a great opportunity to attract clients at a low cost.

There are reasons why this particular model has emerged in Brazil. First, Brazil is internationally recognized as one of the most advanced countries in automated banking technologies and procedures. The country's historically unstable economic environment – with high inflation rates that prevailed for decades until the mid-1990s – has provided major incentives for banking automation, leading to the development of superior expertise in this area (Tigre 2003). Second, the government has fostered the creation of the model with the aim of extending banking services to poor, underserved areas.

Although the regulatory framework allowing correspondent bank creation emerged through many resolutions since 1973, the main changes occurred in 1999 and in 2003 (Alves and Soares 2006), with the consolidation of previous norms on the subject and are the regulatory basis for current CB activities. From these resolutions, the following points are worth mentioning: (i) CB activity is defined as the execution of complementary services to exclusive

activities of financial institutions, through non-financial firms specifically contracted for this purpose; (ii) firms contracted for CB must have another activity as their main source of income, and cannot have CB activities as their main business; (iii) contractor banks are responsible for services offered through CB outlets.

Although CB business is not new, post office savings banks being commonplace in other countries, the Brazilian CB model, because of the range, scale and quality of services provided, and the new technological platforms that enable such service provision, are unique to the current generation of CB arrangements (Kumar et al. 2006:10). POS devices, or basic personal computers operating as terminals, are installed in retail stores so that financial transactions may be carried out. They can also be combined with a bar code scanner, PIN pads or teller machines, which expands the number of possible services. These terminals are typically linked to parent computer servers via a dial-up or high-speed Internet connection, satellite or GPRS (General Packet Radio Service, mobile phone technology for data transmission). Some are always online, while others periodically dial their central servers, depending on the variety and complexity of the services offered in a particular CB arrangement.

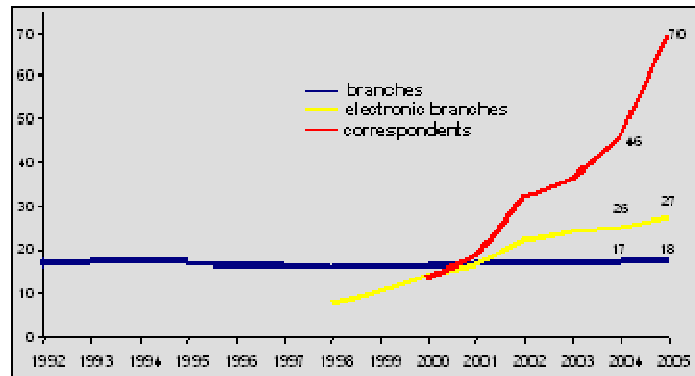


Figure 1: Correspondent banking growth between 2000 and 2005 (in thousands of points)

Source: Febraban (Brazilian Bankers Federation: www.febraban.com.br)

Since coming under regulation, CB has become the low-income population's most important means of accessing banking services. Virtually all major banks, followed by several mid-sized and small players, have started to implement CB points in a wide variety of partner retail stores (post office branches, lottery stores, supermarkets, pharmacies, bakeries, gas stations, etc.) to reach the estimated 40 million bankless Brazilians (Bittencourt et al. 2005). The growth of CB in the last few years is noticeable in all aspects. Febraban – Brazilian Bankers Federation – estimates that the number of correspondents grew constantly between 2000 and 2005 and that, by the end of this period, they stood at almost four times the number of regular bank branches in the country (Figure 1). Other studies have shown growth not only in terms of the number of points of service, but also regarding the number and value of transactions (Alves and Soares 2006).

Through CB, banks have established points of service in poor neighborhoods in big Brazilian cities, and also could reach the country's farthest localities in only three years, even those previously unattended by banks. Although different from bank to bank, the list of services offered by correspondents is quite wide: bill payments, account opening, access to balance and statements, transfer of funds, deposits, government benefits withdrawal and many others, including credit (Thompson et al. 2003). CB penetration is an uncontested factor in democratizing access to financial services, with direct implications for the growth of overall microfinance activity in Brazil.

II.3 Banking services and electronic channels

Banking activities are related to efficiency in resource allocation, and this is why banks play such an important role in economic growth and development. There is also a strong relation between credit provided by banks and GDP per capita. For instance, the least developed countries are those with the smallest banking systems (BID 2005). When considering bank access to the poor, one must include credit among the possible services, specifically to the low-income population. This is even more important given the significant role of microcredit in the fight against poverty (Davis and Khosla 2007).

Besides the question on how traditional banks will enter the microcredit market, another question remains: how will they develop the specific technology to do so? To meet the financial needs of the poor, banks will have to do more than simply offer cheap electronic transactional services, such as bill payments or benefits withdrawal. Although the interest of banks in microcredit is reportedly growing (Alves and Soares 2006; Latifee 2006), banks will need proper technologies and methodologies to profitably offer credit to the poor.

It is worth mentioning that banking services can be broadly divided into two main categories: transaction and relationship services (Diniz 2004). The first category consists of the more structured services, which can be easily automated, such as bill payments, access to balance, etc. Services in the second category are more dependent on negotiation and/or interaction between bank clerks and clients. They include, among others, investment and loan services. Automation in this second category has always been more difficult to achieve, but different electronic channels, such as Internet banking, have shown that this can be accomplished, most often, once a bank has successfully automated services from the first category.

Although the Brazilian CB model seems to work very well for transaction services, it is clear that there are strong opportunities for it to be adapted to relationship services. The model has already allowed large banks to be present in poor areas, and is flexible enough to be adapted for microcredit needs. Another of the model's strengths seems to be its partnership structure, between banks, retailers, technology providers, each one of them assuming part of the job of offering this kind of relational service. In this sense, the combination of banking credit technologies, such as credit scoring, with the knowledge of the market provided by retailers and MFIs, all connected by network integrators, can be the next step in the use of sophisticated technology to extend banking services to the poor.

III. Research approach

III.1 Theoretical framework

Three theoretical perspectives influence the framework proposed in this study: social shaping of technology (SST), structurationist view of technology, and contextualism. Although these three streams of thinking share a number of ontological and epistemological assumptions, they have been combined here because each offers particular concepts that are of great value for the purposes of our research, which is complex and involves multilevel interactions between individuals, groups, organizations and networks at the community/societal level.

III.2 SST (social shaping of technology)

SST studies have been strongly influenced by sociology of knowledge (Berger and Luckmann 1967) and social construction of technology (Pinch and Bijker 1984; Bijker and Law 1992). Aimed at overcoming the deterministic concept of technology often found in technology management literature, where technology is taken for granted, SST views technology implementation as the outcome of social processes of negotiation between networks of social actors (Pozzebon et al. 2006). Such a view pays special attention to actors' interpretations of the meaning and content of technology, and emphasizes the identification of occasions where decisions and actions regarding technology management and change may be undertaken (Clausen and Koch 1999). We retain three important concepts from SST studies: relevant social groups, technological frames and IT implementation as a negotiation process.

- Relevant social groups refer to a set of people (or firms) who share a common geographical space or occupy the same functional boundaries. In addition, individuals in relevant social groups also share a set of assumptions about a given subject of interest. Subgroups and alliances between groups form social spaces and play important roles in the choice of management strategy and use of technology (Pinch and Bijker 1984). In our research, the more important relevant social groups are: (a) CB users, low income populations sharing a common geographic and socio-economic situation; (b) bank agents or institutions; (c) retailers hired as CBs, including micro-stores, post offices, drugstores, etc; (d) CB providers, such as technology providers and network integrators; (e) MFIs; and (f) government (regulators).

- Technological frames refer to basic assumptions, beliefs, and expectations that people hold about a specific technological application (Davidson 2002), including not only the nature and role of the technology itself, but its specific conditions, applications and consequences in particular contexts (Orlikowski and Gash 1994). The concept of the technological frame is similar to that of interpretive schemes (Giddens 1984; Bartunek 1984) and of provinces

of meaning (Weick 1993). Technological frames might be shared by the members of a relevant social group, because they are likely to have common relationships and experiences with a particular IT application (McLoughlin et al. 2000). In our research, we expect that the technological frames of banks, CB businesses, technology providers and CB users will differ.

- IT implementation and its use as a process of negotiation is also central to SST. Not only the content of technology itself, but the set of actors and relevant groups taking part in the negotiations, with their different interests, commitments, perspectives and positions in the structure, will influence the process and outcomes of the technologies put in place (Clausen and Koch 1999). In our research, the process of implementing and using CB platforms will be analyzed, with particular attention given to the negotiation between different social groups, the role played by IT and the consequences in terms of social impacts.

Each of these three initial concepts, selected to compose a framework, is important for different reasons. First, because the level of analysis of our study combines individuals (e.g., low-income CB users), organizations (e.g., banks) and networks of organizations (e.g., banks served by CB providers), we look at ways to take into account agents in a multilevel context. The notion of relevant social groups allows us to recognize individuals and groups without reducing the complexity of intra- and inter-group relationships. Second, because of our focus on technology, the concept of technological frames helps us to recognize what kind of interests, assumptions and expectations different social groups attach to the adoption and use of such technologies. Convergence and divergence of technological frames reveal important mechanisms in the negotiation among relevant social groups. Therefore, the negotiation itself is the third concept of our process-based approach.

III.3 Structurationist view of technology

Since Anthony Giddens' unconventional reformulation of the relationship between agency and structure (Giddens 1984), a number of researchers have been inspired to study the relation between IT and human action (Jones 1997). The structurationist view of technology represents an important stream in IS research (Pozzebon and Pinsonneault 2005). Like SST and contextualism, the structurationist view of technology is a process theory, which accommodates multiple levels of analysis, is contextually and temporally situated, and avoids the blinders of non-historical accounts of social phenomena (Orlikowski and Robey 1991). Here, we outline one of the concepts borrowed from the structurationist view:

- **Technology-in-practice.** This concept, proposed by Orlikowski (2000), focuses on the enactment of technology, pointing out that there are always boundary conditions on how people use physical properties of artifacts. People can (even if they do not) redefine the meaning, properties and applications of a given technology during and after implementation. In our research, technology-in-practice will be represented by the technological platforms and the functionalities put into operation and being used in CB.

The concept of technology-in-practice can be considered one of Orlikowski's main contributions to the application of structuration theory in the investigation of IT phenomena. Technology-in-practice encompasses both the process and the outcomes of adoption, implementation and use of IT by individuals or organizations. In our research, we will pay particular attention to technology-in-practice as the result of the negotiation process among different social groups, in order to recognize what interests or assumptions (technological frames) have prevailed in the implementation and use of CB platforms and with what consequences for the different social groups involved in the process.

III.4 The contextualism approach

The contextualism approach was first introduced by Pettigrew (1985, 1990) and has gained significant attention among IS researchers (Ngwenyama 1998; Orlikowski 1996; Walsham 1993). Arguing that much research on organizational change is non-processual and non-contextual in character, Pettigrew (1985, 1990) emphasizes three elements: context, process and content. Pettigrew claims that content, process and context are equally important and should be considered in concert. He also outlines how different levels of analysis are interconnected and interdependent. As Pettigrew (1990, p. 269) explains, when applying a contextualism lens, we look for "continuity and change, patterns and idiosyncrasies, the actions of individuals and groups, the role of contexts and structures, and processes of structuring" over time. In our investigation:

- Context refers to the social setting where the IT application is being implemented and used. The recognition of different relevant social groups interacting in a given social and cultural setting will make up our research context, along with each group's perceived technological frames.
- Process refers to the understanding of how the IT application is implemented and with what kinds of consequences. Our analysis of the process focuses on how the different technological frames influence the negotiation taking place around the implementation and use of CB.
- Content refers to the socio-technical characteristics of the IT application being implemented and used by particular actors in a given level of analysis. The technologies-in-practice resulting from the negotiation process are considered here.

III.5 A multilevel framework

The combination of the above-mentioned concepts, selected from three complementary theoretical lenses, results in a multilevel framework, presented in Figure 2. It is multilevel because it incorporates inextricably linked levels of analysis: individual, group, organizational and local community. It combines three central concepts (relevant social groups, technological frames and technology-in-practice) and three interconnected dimensions (content, context and process). This multilevel framework will help to identify occasions and mechanisms for implementing IT applications (CB networks) to deliver microfinance.

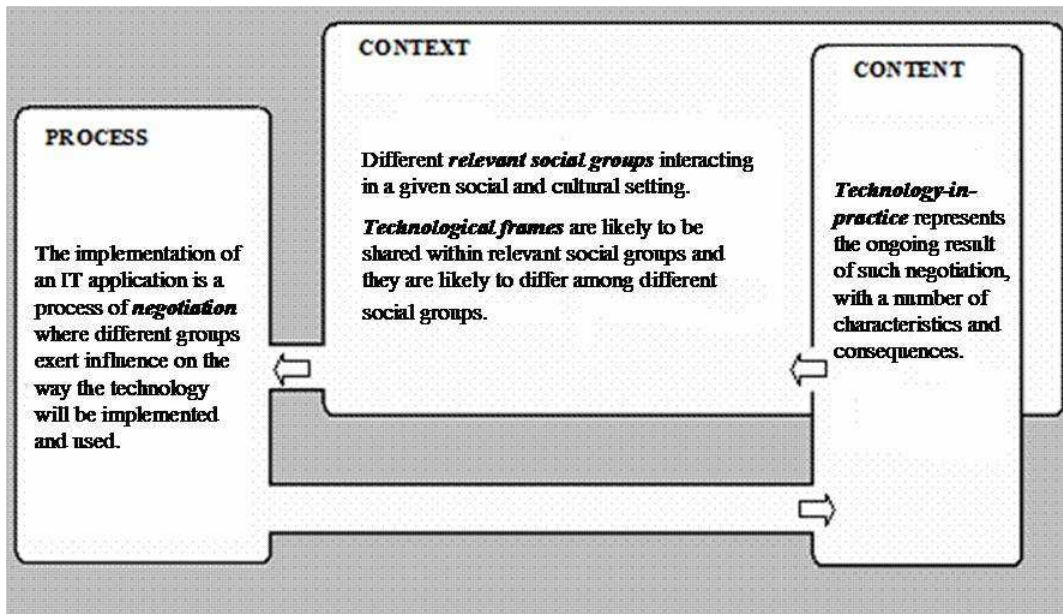


Figure 2: Multilevel framework

Although no hypotheses or propositions are offered, through the identification of key concepts (relevant social groups, technological frames negotiation process, and technologies-in-practice), the framework will guide the empirical work. Because the understanding of the process is seen as fundamental, the relationships and interactions within particular contexts remain to be discovered during data collection and analysis.

III.6 Methodological approach (cases selection, data collection and data analysis)

To apply the multilevel framework to the field research, a research design was conceived in terms of two phases. The first phase, whose results are presented in this paper, was a field work planned to identify how the CB model is articulated and how it has evolved to include relationship-based services, such as microcredit. We applied three basic methods of data collection: (a) extensive analysis of official and public documents; (b) participant observation in meetings and conferences related to the subject; and (c) a qualitative survey carried out involving managers working with correspondent banking networks and/or micro-credit agencies (Denzin, and Lincoln, 2005). The

second phase, which is not covered in this paper and it is still in progress, will try to identify how CB models can be adapted to fulfill the role of microcredit delivery channel. In terms of research strategy, the second phase will be based on in-depth case studies.

Our first task was to identify the relevant social groups of interest for achieving the first research goal: to understand how the CB model is articulated. According to data obtained through documental analysis and participant observation at meetings and conferences, we were able to identify six relevant social groups, namely: (1) banks; (2) microfinance institutions (MFIs); (3) CB business; (4) CB providers; (5) CB users and (6) governmental institutions.

Interviewees were selected according to a "snowball" strategy (Atkinson and Flint, 2001), which consists of identifying an initial group of respondents who are then used to refer to other potential respondents. Such a strategy was useful in our case, since at the beginning of the data collection process we had a detailed understanding of which were the *banks* with relevant CB operations to be interviewed – an information readily available at Banco Central's official sources –, but we lacked information about who were the organizations and persons to be interviewed in the other groups. We thus started our data collection process interviewing bank executives, which in turn indicated relevant, potential respondents at the other groups. We made our interviews with executives from the main institutions of each group considered, however names of these institutions are not presented in this article.

Table 1: Case selection and data collection

Relevant social group	Profile	Selected institution	Main selection criteria	Interviewees
Banks	Commercial	Commercial bank 1	* The bank is representative of the Brazilian banking system. * The bank has microcredit operations. * The bank has a CB network associated to its operations.	2 executives
		Commercial bank 2		2 executives and 1 credit agent
	Government-owned	Public bank 1		1 executive
		Public bank 2		1 executive
	Social	Social responsibility bank 1		1 executive
		Social responsibility bank 2		2 executives and 1 credit agent
CB Businesses	Non-financial CB	Supermarket	* The volume to CB transactions (according to bank numbers)	1 executive
	Financial CB	“Financeira”		1 executive
CB providers	Technology provider	IT Provider	* Its representativeness within the CB network	2 executives
	CB network integrators	Network 1		3 executives
		Network 2 Network 3		
MFIs	NGO MFI	Oscip	* Its representativeness within microcredit operations	1 executive
	For-profit MFI	SCM		1 executive

To start the "snowball" strategy, we included in our data collection process the most diverse possible range of banks we considered representative of their social group. Considering the three different types of banks involved in the microfinance market (Rhyne and Otero, 2006), six banks were contacted: two banks that see microfinance as one of their lines of business; two state owned banks, to which microfinance is an instrument of governmental policies; and two banks that got into microfinance based on internal social responsibility policies. From the interviews with bank officers, institutions belonging to other social groups were mentioned as important to CB business. Regarding these other institutions, we interviewed two MFIs (one for-profit and one NGO), two CB businesses (one financial firm and non-financial retail firm), and four CB providers (one IT provider and three network integrators).

At the end of this process, we conducted twenty interview sessions with members of the four first relevant social groups. Table 1 presents the names we will use to identify each of the interviewed institutions and summarizes our selection criteria and the number of interviewees per institution. No individual CB users were selected for this research phase, as they represent a huge population mass, and require a more sophisticated selection process. No government agencies/officers were interviewed for this first phase either, since we could collect information from

the well documented CB regulation process. This two remaining groups (CB users and governmental institutions) will be interviewed only in the second phase of the research.

The criteria for selecting the executives and credit agents were based on their position regarding microcredit and/or CB operations and their availability for doing the interview. As result, in two of the banks, we interviewed the executive responsible for the CB network and the one responsible for microcredit operations, as well as their credit agents in separate sessions and in the IT provider in one of the banks two executives were interviewed in a single session. All the other interviews were set in single sessions, one for each executive. All the interviews were semi-structured, guided by a research protocol (interview guideline), recorded with the consent of the interviewees, and transcribed for analysis.

The data analysis was based on data coding (Miles and Huberman, 1984) guided by our framework, for detailed examination of interviews transcript. Thus, excerpts were classified into different categories, as follows: relevant social groups involved in the use of CBs (current situation and evolution over time); technological frames from different social groups (interviewee's beliefs and assumptions concerning potential services, business opportunities, social opportunities and challenges related to CBs); services and technologies in practice associated to CBs (current situation and evolution over time); negotiation process (frame divergence/convergence among groups and events and moments in the negotiation that led to current use of CBs).

This analysis process helped the researchers identify technological frames associated to each relevant social group, observe moves of frame convergence and divergence among and within such groups, as well as identify events and moments of negotiation and the technologies-in-practice resulting from the negotiation process. The evidence and data collected through the interviews, and categorized according to the above codes, allowed us to answer our research questions: how the CB model emerged, and how it evolved along time to include a wider range of bank services. The result of the analysis is the object of the next section.

IV. Analysis and comments on the data collected

The structure of this section reflects the two research questions we aim to answer: first, what pushed Brazil's banks and related sectors to develop a CB channel to deliver banking services to the poor; second, how this model evolved over time to include relationship-based services. Answers to each of these questions are addressed, respectively, by subsections IV.1 and IV.2. What differentiates these subsections is their temporal delimitation: IV.1 refers to the period of emergence of the CB model (1999-2002), whereas IV.2 refers to what could be called the "expansion period" (2003-2007). A summary of our data analysis for each of these periods, based on the codes and categorization described at section III is presented on tables 2 and 3 respectively. Each table is followed by a detailed description of the interaction between relevant social groups, their technological frames, negotiation process and technology-in-practice, for each period.

IV.1 The emergence of the CB model and its consolidation as a transactional services channel

The first question we intend to answer in this paper is: What pushed Brazil's banking sector and technology partners to develop CB to expand banking services to the poor? To do so, using our multilevel conceptual framework, we first identified the Relevant Social Groups, their technological frames, i.e., how each one of them perceives the role and functions of the CB technology. Then, an evaluation of the negotiation process related to CB implementation, brought about technology-in-practice, i.e., the results of the implementation in terms of services offered and characteristics of technology used, backed by the new social group created in the process. This first period of the CB model, which dates from 1999 to 2002, started with the implementation of the new regulations that have shaped the current Brazilian CB model. Although the regulations were released in 2000, the negotiation process that triggered them dates back to 1999. Table 2 offers a summary of the period. The table's columns – relevant social groups, technological frames, negotiation process and technology-in-practice – correspond to the codification used for data categorization and analysis.

Table 2: Multilevel framework analysis for 1999-2002 period			
Relevant Social Groups	Technological Frames	Negotiation Process	Technology-in-practice
Government	Social benefits delivery	* Governmental	Transactional (non-

Public banks	Public policy execution To open new channels	regulation allows non-financial businesses (e.g., retailers) to become CB	relational) CBs emerge focusing on bill payment (new channel sought by banks). In addition, benefits delivery to low-income populations (sought by government).
Big retail banks	To open new channels To discover new markets Social responsibility initiatives		
Technology providers	New business opportunities	* Banks hire technology providers and retailers	Ordinary POS, Internet, satellite, GPRS
Retailers - chain	New sources of revenue	* Retailers attract new customers (low-income population)	
Retailers - independent	To attract new clients		
Retailers - small			
Low income population	Basic banking services Public benefits withdrawal		

(a) Relevant social groups and technological frames

During this period, relevant social groups included legal agents (federal government, Central Bank, etc.); public banks and major banks (big retail banks) concerned about social responsibility; technology providers; retailers of many types involved with correspondents (chain, independent and small retailers); and the lowest income group, which uses banking services through correspondents.

Key to the creation of a new regulation for correspondents in Brazil was the need for the federal government to implement public policies directed towards people on low incomes. Meanwhile, competition in the retail market by big banks was drawing attention to less explored markets. Stagnation of the middle class and a bankless population of 40 million – nearly half the productive population, mostly engaged in informal jobs – had to be targeted in some way. In addition, the need to develop low cost channels for lower value-added services, such as bill payments, required viable alternatives for delivering banking services. Interestingly, in Brazil all bills are paid in banks, whether the payee has a bank account or not. This drives millions of people to bank branches just to pay their bills. As a bank branch is the most expensive bank channel, this makes no sense.

Another relevant aspect is the sophistication of Brazilian banking technology. The maturity level of Brazilian banking technology and banking technology providers available in the country have contributed to the development of technical solutions to quickly respond to demands for implementation of CB. One of the main banking technology providers adapted a terminal, which had previously been developed for a public health network system, so that it could be used as a CB terminal.

Big chain retailers, independent mid-sized retailers and smaller retailers saw the CB model as an opportunity to offer new services and increase revenues by charging for banking services. Some saw the closer relationship with banks as an incentive. Another advantage to retailers’ becoming CBs was the possibility of attracting new clients when offering banking services, hence increasing sales in shops by up to 20%, as was mentioned by some interviewees. On the other hand, lottery shops had no choice: it was mandatory that they become correspondents due to contractual demands by the state bank that controls their operations.

For low-income populations, correspondents are an appealing alternative, which allows them to pay their bills without traveling, hence saving money and time previously spent on transportation to the nearest bank branch. Government benefits, now more available even to those with limited mobility, are important to local development, since the beneficiaries spend the money where they live, strengthening the local economy. Electronic cards in the hands of poor people improve the self-esteem of those who barely had access to formal identification (Stal 2001).

For big banks, CB was a low cost channel to new clients via non-traditional branches, a first step in a fresh and unexplored market. For technology providers, correspondents opened a window to new business, moving from adapting old products or readapting business processes, to providing new services, such as software firms responsible for transactions capture systems that later become network integrator firms in the CB value chain. For retailers, CB was a new source of revenue, based on a flat per-transaction fee, paid by banks, and offering a service that can attract new clients to stores. For the low-income population, CB was a way, sometimes the only way, to access banking services close to home, without having to deal with a formal and frightening traditional bank environment.

(b) The emergent social group in this period

When we observe how commercial banks have structured their CB networks, it emerges that the operational arrangements differ significantly among institutions. At one extreme of the spectrum, some banks adopt what might be called a “direct CB operation model,” where all the activities related to CB prospection, hiring, installation and control are integrated by the bank. The bank is responsible for the prospecting and hiring of the individual retail businesses or institutions that will form its CB network, as well as for installing equipment and monitoring each individual correspondent’s performance. Some banks assign these tasks to their branches, so that each particular branch is responsible for managing a certain number of CB points within a geographical jurisdiction. In other cases, a specific division has been created by the bank to manage the entire CB network in a centralized way.

At the other end of the spectrum, some institutions have delegated all the tasks related to CB prospection, hiring, installation and control to third-parties, in what we call a “mediated CB operation model.” These banks hire companies called **CB network integrators** that are responsible for all the logistics related to prospecting, selecting and hiring, on the bank’s behalf, the commercial establishments that will serve as CB points. It is also the CB network integrator who installs equipment, provides technical support and training, and monitors and controls CB activities. In this configuration, it is the CB network integrator who decides and informs the banks of which businesses (pharmacies, groceries, supermarkets, etc.) will be hired as CB point. The integrator is also responsible for each correspondent’s performance and results. The integrator receives a flat fee per transaction performed by the network from the bank, part of which is redistributed to the correspondents.

Finally, there are banks that adopt a mixed or intermediary configuration, where the bank is responsible for some of the activities, but delegates others to integrators. In this model, the bank will typically take on strategic activities, such as selecting and hiring the CB points, but will delegate all the logistics related to installing equipment, training the correspondent in the use of the technology, as well as providing regular technical support to an integrator.

Historically, the use of CB network integrators appeared in Brazil’s Northeast Region, an area characterized by its high poverty indicators and low access to bank branches. CB network integrators started out with a view to supplying transactional services to the area’s population. Due to the insufficient bank outreach in the region, there was a need for a channel by which people (and particularly the low income population, who had no access to banks) could gain access to basic transactional services, mostly bill payment and governmental benefits. Correspondents were a particularly convenient channel for them – and in many cases the only one available close to home. In the regional context, local firms were better positioned than banks to determine which local players should be hired as correspondents and how to deal with them. Hence, network integrators flourished and accomplished the task of providing the population that had previously been isolated with a channel for transactional services in a region where bank outreach was insufficient. This brought about a new relevant social group, with a central role in the structuring of CB networks in regions traditionally underserved by banks.

(c) Negotiation and technology-in-practice

The rapid expansion of CB forced banks to strengthen partnerships with technology providers and network integrators. The volume of processes grew progressively, requiring adjustments so that accuracy and security in payment confirmations and new agreements with facilities, such as water, power and gas providers could be maintained. In this first phase, correspondents were attractive to all the social groups involved. At the time, technology was appropriate for the services offered, implementation costs were acceptable to banks, and retailers easily incorporated the whole process. Users enjoyed the advantage of having banking services without the inconvenience of having to go to a bank.

CB models, based mostly on ordinary POS, enabled the technology-in-practice to be adjusted to the interests of all the groups involved, since the main activities were related to bill payment or benefits delivery through cards embedded with electronic chips or magnetic strips. The simplicity of the equipment used favors its handling by employees with little training in technology, and allows banks to keep control over networks and databases. Cell phone technology expansion in Brazil also helped the process, since GPRS networks were largely used, besides Internet and satellite connections.

The application of our framework allows us to conclude that, in the first period, although we recognized different technological frames, associated with different relevant social groups, related to the structuration of a CB platform in several regions of the country, we did not find significant conflicts of interest. The emerging technology during

this period was an IT-based CB platform for transactions, such as bill payment and benefits delivery. This privileged use of correspondents for transactional financial services seems to fulfill the goals of all the groups: banks seeking new channels, the low-income population seeking access to bank services, and government seeking a channel to deliver benefits to the low-income population.

IV.2 The evolution of the CB model based on the expansion of services offered

This paper's second research question is: How has this model evolved over time to include relationship-based services, traditionally more difficult to deliver via electronic channels than transactional services? Again, because of legislation, correspondents were required to expand their service range as of 2003. This came about because of government actions to improve microfinance in Brazil. A summary of this evolution is given in Table 3, which lists the interaction between relevant social groups, their technological frames, negotiation process and technology-in-practice during the expansion period (2003-2007).

Table 3: Multilevel framework analysis for 2003-2007 period			
Relevant Social Groups	Technological Frames	Negotiation Process	Technology-in-practice
Government	Microfinance expansion	* MFIs are allowed to become CBs, but their low technology profile hinders significant adoption * Government regulation obliges all banks to use 2% of their sight deposits for microcredit and to create simplified accounts * Partnership between public banks and MFIs * Microcredit emerges as a business for existing and new players * Small banks hire technology providers and hire retailers * Turn-key model allows small banks to grow quickly * Low income demand new banking services through CB	CBs' segmentation, due to different models: 1. Bill payment (POS) Associated model: network managed by the technology provider or by big banks 2. Transactional portfolio (thin client terminal) Associated models: network managed by big banks or by retailers (chains) 3. Relational services using credit agent (result of partnerships between banks and MFIs)
Public banks	New channel		
MFIs and credit agent	Partnerships w/ MFIs		
	Partnerships w/ public banks		
Big retail banks	New channel		
	New markets		
	Microcredit interest		
Small banks	Consigned credit delivery		
	New business model (non-branch bank, e.g. Lemon)		
Technology providers	Turn-key business model		
Retailers - chain	New source of revenue		
	To attract new clients		
Retailers - independent	Basic banking services		
Retailers - small	Public benefits withdraw		
Low income population	Opening bank accounts		

(a) Relevant social groups and technological frames

In April 2003, in a document (Ministério da Fazenda 2003) outlining priorities for the year's economic agenda, the Brazilian Ministry of Finance stated that mechanisms such as CB would have to be strengthened to increase the availability of credit and extend financial services to the low-income population. In July of the same year, the government enacted Resolution 3110, which extended the right to be hired as a correspondent to additional financial institutions so authorized by the Central Bank, thereby including MFIs, which had previously been prevented from performing this role, and expanding correspondents' services. Hence, correspondents would be able to offer services that went beyond simple transactions. What's more, the accumulated experience from the previous period attracted new players and somehow changed the scenario.

To improve microfinance, the government implemented new rules for the market: (i) MFIs were allowed to become correspondents, (ii) commercial banks must use 2% of their sight deposits specifically for microcredit, (iii) consigned credit (credit offered based on salary or retirement benefits) would be regulated at low interest rates, (iv) simplified bank accounts, limited by the balance level and number of operations, could be opened at CB service points, without income statement declaration. Besides the social groups previously identified, other banks became interested in the CB business. If the pioneer banks were driven either by public policy demands (state-owned banks)

and social responsibility concerns, the new players chose to capitalize on the low value credit market. Smaller banks, that clearly had no worries related to taking people out of traditional branches, saw CB as a potentially profitable business.

(b) The emergent social groups in this period

Experience from the previous phase convinced banks of the CB model's potential as a banking channel. In 2002, Lemon Bank, a small bank created by young investors who had started out in the financial market as successful Internet brokers, decided to set up a no-branch bank, relying exclusively on correspondents. Being new in the market and interested in positioning itself as the bank of the large unbanked population, as its slogan "The bank of all Brazilians" suggests, Lemon bank needed to offer a broader range of services, either transactional or relationship-based ones.

Lemon Bank, which did not want to enter into the strict model of microcredit for microentrepreneurs, supported by most government actions, developed a strong strategy to offer small loans to individuals, based on information collected through correspondents. It also invested in network integrator firms, buying some, but offering services to the entire market all the same. As part of the bank social group, Lemon Bank has positioned itself as an aggressive player in the CB market, as this is its only business channel. After just a few years of operation, it has reached a number of more than 5,000 POS (CBs) and is a market leader.

Banco Popular do Brasil (BPB) has also positioned itself as a bank based on the CB model. Following a major reorganization, it started operations in 2005 and has had two fronts in this market: one related to CB in regular retail stores, where it explores services in the same way as big banks and Lemon Bank do, focusing on collecting bill payments and offering loans to individuals; the other related to the major microfinance strategy, whereby credit is offered to productive business sectors and to entrepreneurs. To act on this second front, BPB hires MFIs as correspondents, using their capacity to evaluate potential clients and offers them the entire technological platform needed to operate as a full financial provider, way beyond the traditional MFI operation, almost always based exclusively on microcredit offer.

(c) Negotiation and technology-in-practice

With new services available and a more experienced market, technology-in-practice during this period was characterized by increased sophistication of the terminals implanted in correspondents, and maturity of network integrator firms. New services necessitated investments in terminals, since ordinary POS offered nothing more than bill payments. The demand for these new terminal functionalities was driven by the growth of account opening operations at CB service points. In 2005, 25,000 new terminals were installed in 9,000 lottery shops around the country. Lottery terminals were more like bank terminals through which up to 20 different services besides the lottery could be processed. Technology providers launched scalable terminals that could grow from offering basic bill payment to more sophisticated services, simply through the addition of new parts, such as scanners, cash drawers, and so on, more like thin client devices with LCD screens.

Network integrator firms started taking care of the whole business, which was very convenient for smaller players without the strong infrastructure of bigger banks. The complete service of CB management, known as the "turn-key" model, includes hardware, software, network, management systems, help-desk support for retailers and part of the training related to technical operation. The dedicated expertise of the network integrator firms has contributed significantly to the development of the CB model.

The increased service offering also necessitated further training of workers in retail businesses, both to operate terminals and to understand the complex banking services. In terms of microcredit and CB business, three models emerged as noteworthy. The first one is the partnership between banks and MFIs, which works as correspondents. The second is related to banks that have implemented a credit offering system using information collected through correspondents. The third model is related to banks which have both operations with microcredit and correspondents, but make little synergy between both operations. We also found banks that started to offer microcredit through correspondents, but later gave up, complaining about limits imposed by the government on interest rates for microcredit, which were allegedly insufficient to cover business costs, clearly related to unexpected high default rates..

The application of our framework to this period allows us to conclude that, as conflicts in terms of technological frames emerged, the consensus around the emerging technology tended to disappear. The arrival of new relevant social groups and new interests helps to explain a much richer picture in terms of CB models. Complexity increased, but we could not yet perceive a solid convergence in terms of the technology-in-practice and its intended use for relationship-based services.

V Final comments

We posit two main contributions from our research so far. First, we conceived a conceptual framework to serve as a tool for creating a joint picture of CB in Brazil, which seems powerful for understanding social interactions at a micro-macro level. As the CB model relies on a complex social and technological context, without such a theoretical lens, the collected interviews would reveal a collection of stories without clear connections. The conceptual approach helped us see CB evolution as a negotiation process among many relevant social groups, with both shared and conflicting technological frames. Above all, the conceptual approach increased our understanding of why and how particular technologies emerge in practice, sometimes with unintended consequences and uses.

In short, using the conceptual model, it was possible to:

1. Identify the different relevant social groups and their technological frames;
2. Identify shared and conflicting technological frames;
3. Recognize how relevant groups and their respective technological frames influence negotiation processes;
4. Identify technology-in-practice and the dominant technological frames.

We believe there is a huge potential in improving this framework and its theoretical transferability to other social phenomena. In the current study, we apply the multilevel framework for a better understanding of the microcredit and CB problem in the Brazilian context, but this model could be used to understand the same problem in other countries, or different social problems in a similarly complex context. In our case, the presented framework was helpful indeed to answer the two questions related to our research problem: what pushed the development of Brazilian CB model and how this model has evolved over time from transactional services to include relationship-based services.

The second contribution is a richer discussion on the social and technological forces that have allowed the development of the Brazilian CB model, and how the latter has evolved from a channel for providing basic transaction services to the poor to a more complex set of services. As the business grows, it attracts more social groups with diverse interests, objectives and technological frames.

The study of banks that operate in partnership with MFIs through the CB channel offers the opportunity to explore synergies. MFIs becoming correspondents has proved feasible, although more experience will be needed to create a real “demonstration effect.” MFIs, in general, need to overcome a big technological gap in order to explore CB model prospects. Certainly, there is not a single model for consolidating correspondents as a channel for delivering a full range of financial services. The combination of MFIs’ strong risk-managing and credit analysis expertise with the funds, the technological tools and back-office systems of traditional banks seems very promising for the expansion of CB service delivery.

CB network integrator firms will play a key role. Though they have thrived in an environment based almost purely on payment and other transactional services, these firms can expand to offer other services that are more relationship-based. As noted before, banks automated the most structured processes first and then moved on to other service categories. Network integrator firms have a wide physical outreach, especially in regions underserved by banks, they are therefore closer to reaching a critical mass. Having also evolved from other business fields, they can be expected to adapt to new realities.

So far, a good story has been told, but much of it is still unfolding. This paper presents partial results from a study that should further uncover how the CB model can meet the ever-increasing service requirements of the underprivileged. In our next research phase, we plan to conduct in-depth case studies into a number of CB networks, and will include socially relevant groups not yet interviewed (e.g. people on low incomes) in order to better understand the barriers and the triggers of new models. Interviews were done with a representative group of banks in the correspondent and microcredit business, but other banks should be surveyed. Government should also be part of the research, as well as microcredit and CB clients. Other firms and social groups are yet to be interviewed, and this will be a very complex undertaking because of sheer numbers.

References

- Alves, Sérgio D.S. & Soares, Marden M. (2006). *Microfinanças: democratização do crédito no Brasil e atuação do Banco Central*. Brasília: Banco Central do Brasil, 91p.
- Atkinson, R. & Flint, J. (2001). " Accessing Hidden and Hard-to-Reach Populations: Snowball Research Strategies". *Social Research Update*, issue 33. <http://sru.soc.surrey.ac.uk/SRU33.pdf> (09/01/2008).
- Bartunek, J.M. (1984). "Changing interpretive schemes and organizational structuring: the example of a religious order". *Administrative Science Quarterly*, 29, 355-372.
- Berger, P. L.; Luckmann, T. (1967). *The social construction of reality: A treatise on the sociology of knowledge*. Garden City, NY: Anchor.
- BID (2005). *Liberar o crédito: como aprofundar e estabilizar o financiamento bancário*. Rio de Janeiro: Banco Interamericano de Desenvolvimento.
- Bijker, W.E.; Law, J. (1992) *Shaping technology/Building society: studies in socio-technical change*. MIT Press, Cambridge, Massachusetts.
- Bittencourt, G.; Magalhães, R.; Abramovay, R (2005) "Informação de crédito: um meio para ampliar o acesso dos mais pobres ao sistema financeiro". *Pesquisa & Debate*, 16(28): 203-248.
- Claessens, S. (2006). "Access to financial services: a review of the issues and public policy objectives". *The World Bank Research Observer* 21 (2): 207-240
- Clausen, C. & Koch, C. (1999). "The role of space and occasions in the Transformation of Information Technologies - Lessons from the Social Shaping of IT Systems for Manufacturing in a Danish Context". *Technology Analysis and Strategic Management*, 11 (3): 463-482.
- Costa, C.A.N.; Milagres, R.; Righi, H. (2007). *O sistema Financeiro Nacional: parcerias, alianças e inovações*. Nova Lima: Fundacao Dom Cabral: Nucleo Serasa de Inovação e Servicos, 2007.
- Daley-Harris, S. (2006). *State of the Microcredit Summit Campaign: Report 2006*. Washington: The Microcredit Summit Campaign, 66p.
- Davidson, E.J. (2002). "Technology frames and framing: a socio-cognitive investigation of requirements determination. *MIS Quarterly*, 26 (4): 329-358.
- Davis, S; Khosla, V. (2007). *Taking stock of the Microcredit Summit Campaign: What worked 1997-2006? What is needed 2007-2015?*
Available at <http://www.microcreditsummit.org/papers/Assocession/DavisKhosla.pdf> (05/01/2008).
- Denzin, N.K. and Lincoln, Y.S (2005). *Handbook of qualitative research*. Sage Publications, California.
- Diniz, E.H. (2004). *Evolução e segmentação no perfil dos serviços bancários pela Internet*. Relatório NPP EAESP FGV, 2004.
- Donner, J. (2008). Research approaches to mobile use in the developing world: a review of the literature. *The Information Society* 24(3).
- Eisenhardt, Kathleen M. (1989). "Building theories from case study research". *Academy of Management Review*, vol.14, n.4, p.532-550.
- Giddens, A. (1984). *The Constitution of Society*. University of California Press, Berkeley.
- Greve, C. M. F. (2002). *Credibahia: O Programa de Microcrédito do Estado da Bahia*. Disp. em <http://unpan1.un.org/intradoc/groups/public/documents/ICIEPA/UNPAN005469.pdf> (04/12/2006)
- Ivatury, Gautam (2006). "Using technology to build inclusive financial systems". *CGAP Focus Notes* n.32.
- Jones, M. (1997). "Structuration Theory and IS", in: *Re-thinking management information systems*. Currie and Galliers (Eds.), Oxford.
- Kumar, A.; Nair, Ajair; Parsons, A.; Urdapilleta, E. (2006). *Expanding bank outreach through retail partnerships: Correspondent banking in Brazil*. Washington DC: World Bank Working Paper no.85.
- Latifee, H. I. (2006). *The future of microfinance: visioning the who, what, when, where, why, and how of microfinance expansion over the next 10 years*. Grameen Trust Bangladesh.
- Langley, A. (1999) "Strategies for theorizing from process data". *Academy of Management Review*, 24 (4), pp. 691-710.
- Lyman, T.R.; Pickens, M.; Porteous, D. (2008). "Regulating transformational branchless banking: mobile phones and other technology to increase access to finance". *CGAP Focus Notes* n. 43.
- McLoughlin, I. et al. (2000) "Rethinking Political Process in Technological Change: Socio-Technical Configurations and Frames". *Technology Analysis and Strategic Management*, 12 (1) pp. 17-37.
- Ministerio da Fazenda (2003). Política econômica e reformas estruturais. Brasília. <http://www.fazenda.gov.br/portugues/releases/2003/Politica%20Economica.pdf> (15/03/2007)

- Ngwenyama, O.N. (1998). "Groupware, social action and organizational emergence: on the process dynamics of computer mediated distributed work". *Accounting, Management and Information Technology*, 8: 127-146.
- Nichter, S.; Goldmark, L.; Fiori, A. (2002). *Entendendo as microfinanças no contexto brasileiro*. PDI/BNDES. Julho 2002.
- Orlikowski, W. J. (2000) "Using technology and constituting structures: a practice lens for studying technology in organizations". *Organization Science* 11(4): 404-428.
- Orlikowski, W.J. & Gash, D.C. (1994) "Technological frames: making sense of information technology in organizations". *ACM Transactions on Information Systems* 12 (2): 174-207.
- Orlikowski, W.J. & Robey, D. (1991). "Information Technology and the Structuring of Organizations". *Information Systems Research* 2 (2): 143-169.
- Orlikowski, W.J. (1996). "Improvising organizational transformation over time: A situated change perspective". *Information Systems Research*, 7 (1): 63-92.
- Pettigrew, A. M. (1985) "Contextualist Research and the Study of Organizational Change Processes," in Mumford, E. et al. (Eds.) *Research Methods in Information Systems*. New York: North Holland.
- Pettigrew, A.M. (1990) "Longitudinal field research on change: theory and practice", *Organization Science* 1 (3): 267-292.
- Pinch, T.F. & Bijker, W.E. (1984). "The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other". In: Bijker, W.E. et al. (Eds.), *The social construction of technology systems*. The MIT Press.
- Porteous, D (2006) *The Enabling Environment for Mobile Banking in Africa*, Paper commissioned by DFID, available at www.bankablefrontier.com/publications.php (05/04/2008)
- Pozzebon, M. & Pinsonneault, A. (2005). "Challenges in Conducting Empirical Work Using Structuration Theory: Learning from IT Research". *Organization Studies* 26 (9): 1353-1376.
- Pozzebon, M.; Tatih, R.; Pinsonneault, A. (2006). "Combining social shaping of technology and communicative action theory for understanding rhetorical closure of IT". *Information Technology and People* 19 (3): 244-271.
- Rhyne, E.; Otero, M. (2006). Microfinance through the Next Decade: Visioning the Who, What, Where, When and How. A Paper Commissioned by the Global Microcredit Summit 2006. November, 2006.
- Stal, I. L. (2002). *Bolsa escola como alternativa de inclusão social*. VII Congresso Internacional del CLAD sobre la Reforma del Estado y de la Administración Pública, Lisboa, Portugal.
- Stegman, A; Rocha, M. Davis, W. (2005). *The role of technology in serving the unbanked*. The Frank Hawkins Kenan Institute of Private Enterprise, University of North Carolina.
- Thompson, C.E.M.; Barbosa Júnior, C.L.; Frota, I.L.N. "A parceria Bradesco e Correios no Bando Postal: uma abordagem estratégica, tecnológica e social. In: *X Simpósio de Engenharia de Produção*.
- Tigre, Paulo Bastos (2003). *E-commerce readiness and diffusion: the case of Brazil*. University of California at Irvine, Center for Research on Information Technology and Organizations.
- UNDP (2007). *The United Nations Development Programme Annual Report 2007*. Available at <http://www.undp.org/publications/annualreport2007/IAR07-ENG.pdf> (02/05/2008).
- Walsham, G. (1993). *Interpreting Information Systems in Organizations*. John Wiley and Sons, Cambridge.
- Weick, K. (1993). "The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster". *Administrative Science Quarterly*, 38 (4), 268-282.
- Weissbourd, R. (2002). *Banking on technology: Expanding financial markets and economic opportunity*. Prepared for the Brookings Institution Center on Urban and Metropolitan Policy, the Financial Services Roundtable and the Ford Foundation. Washington, DC.