

学校编码: 10384

分类号\_\_\_\_\_密级\_\_\_\_\_

学号: 27720121154280

UDC

厦 门 大 学

硕 士 学 位 论 文

金融发展对原欧元区 11 国不均衡的影响：  
固定样本数据法

Financial Development's impact on  
inequality in the original Eurozone eleven:  
A Panel Data Approach

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论文提交日期: 2014 年 03 月

论文答辩日期: 2014 年 05 月

学位授予日期: 2014 年 月

答辩委员会主席:

评 阅 人:

2014 年 05 月

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## 摘要

近几年来，欧元区一直在和低经济在增长数据做斗争。经济危机导致了紧缩政策、削减和生产力不增反而税收增加。与此同时，与欧盟和欧元区不均衡有关的争论正在酝酿中。成员国的不断扩张使得在减少不均衡的同时取得经济增长的问题上，更难达成统一的政策。提出来供欧洲立法者参考的政策的数量也令人惊愕。此论文着重用不同于仅是重新分配政策的方法来处理不均衡问题。

在此之前对金融发展的研究主张金融发展实际上能减轻不均衡。有证据显示金融发展也鼓励经济增长，而且不仅是通过反向因果关系，这听起来像一个很好的结合，一种双赢的局面。

但是，在这片论文之前都没有任何研究是特别着眼于金融发展对欧盟或者原欧元区十一国间不均衡的影响。不仅包括一小部份经济发达国家，这片论文针对超过 100 个经常被研究且能提供有趣结论的国家（大样本），提出不同的结论。通过固定样本数据法，使用 1999 年到 2011 年间的可用数据，我们表明原欧元区十一国的经历不同于世界平均水平。股票市场对不均衡有消极影响，然而私人信贷显示出对 GDP 的增长有积极的影响，这显示了不同的国家在不同的发展阶段需要不同的政策。

**关键词：**金融发展；不均衡；欧元区；固定样本数据

## **Abstract**

Recent years have seen the Eurozone struggling with low economic growth figures. The financial crisis has led to austerity measures, cut backs and increased taxes without increased productivity. At the same time the debate about income inequality in the EU and the Eurozone has been brewing. Constant expansion of member countries makes it harder to have unified policies on how to reduce inequality whilst achieving growth. The amount of suggested policies offered to EU lawmakers is staggering; this paper looks to focus on a different approach than mere redistributive policies to deal with inequality.

Previous studies into financial development have advocated that financial development in fact reduces income inequality. With proof that financial development also encourages economic growth, and not just through reverse causality, it sounds like a great combination, a win-win situation.

BUT, prior to this paper there has not been a study looking at financial developments impact on income inequality in the EU or the Eurozone original eleven specifically. With a small group of countries which are economically developed, this paper offers a different result to the big, 100-country plus, samples often studied and offers interesting results. Through a panel data approach, using available data from 1999-2011, we show that the experience is different in the Eurozone original eleven to that of world averages. Stock market size and stability has a negative effect on income inequality whereas the private credit to GDP is shown to have a positive effect, suggesting that different policies are needed in countries at different stages of development.

**Key Words:** Financial Development; Income inequality; Eurozone; Panel data

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## Introduction

Since the financial crisis, starting in 2007, there has been a big focus on how to re-establish growth in the developed world. The European debt crisis has lead policymakers unable to find a clear path to get the struggling economies back running. The policy adopted by the EU has been one of austerity, whilst the IMF (International Monetary Fund) and the ECB (European Central Bank) has acted as lenders of last resort. Growth in the EU is usually measured by the main indicator GDP (Gross Domestic Product), and GDP per capita, Bonesmo Fredriksen (2012). The tightly knit EU network has always been focusing on growth, but more recently the focus has come to include income inequality. Inequality hampers growth, so there has been conducted a lot of research on how to achieve economic growth without increasing inequality. The OECD has published a working paper series entitled “Less income inequality and more growth – Are they compatible?” in eight parts. This illustrates the importance of the subject. The EU, now, has 28 member states, of them, 18 countries are members of the Eurozone, using Euro (€) as their currency. When the Euro was created there were eleven countries that adopted the currency as their legal tender 1<sup>st</sup> January 1999. The Treaty of Maastricht set the convergence criteria for countries wishing to join the European Monetary Union. The criteria are economic and financial measures to ensure the stability of the currency union and its members<sup>1</sup>.

The EU and the Eurozone's expansions have caused the union to become economically uneven as there are big differences in wealth and inequality between its members. This is the root of what feeds the motivation of this thesis. Dissimilarities make it impossible to have union-wide policies regarding taxations and a multitude of other issues which will fit all members perfectly. A prescribed policy might fit the newest member Latvia, but not a country such as France because of their economic differences. The original Eurozone eleven are more economically developed and equal in terms of incomes.<sup>2</sup> Therefore are these countries chosen, as the sample of countries, to test if financial development has an impact on income inequality. If financial development has a negative impact on income inequality in the most mature economies, then it will be safe to say that developing economies should follow the same path and it can possibly be seen as something close to a union-wide policy offer. Levine (2004) proves, in a lengthy paper,

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<sup>1</sup> See [http://europa.eu/legislation\\_summaries/other/125014\\_en.htm](http://europa.eu/legislation_summaries/other/125014_en.htm) for an overview

<sup>2</sup> The Eurozone eleven: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain

that financial development in general helps economic growth and not just through reverse causality. Aghion, Howitt and Mayer-Foulkes (2005) develop a model that shows that financial development has a bigger impact in low and middle income countries. None of the countries in the EU can be classified as low income countries but following the argument; if financial development has an equalling effect in the Eurozone eleven it will have a similar or even bigger effect on the newly added countries.

The results of the investigation can therefore aid to fill a gap in the otherwise directly policy-filled research conducted to date. As far as this author is aware, there have not been any papers addressing the specific issue of how financial development impacts inequality in the EU or the Eurozone. Using a panel data approach on available data from 1999-2011 we find that financial development can have a negative effect on inequality through the markets, but not through growth in institutions. This paper will not give direct policy options, but its findings can be used to construct specific policies by officials and academics. The nexus of financial development and economic growth is taken as a given in this paper, which can be contested, but will not be dealt with here.

The rest of this thesis is structured as follows: Chapter 2 presents the most relevant literature in three parts; first, theoretical models, second, empirical work based on testing the theoretical models and lastly papers on inequality in the EU. Chapter 3 looks at the data in detail and explains the selection of these. Chapter 4 outlines the methodology and expectations. Chapter 5 contains the results and analysis and finally Chapter 6 presents the conclusion. Subsequently follows the references, appendix and acknowledgements respectively.



## Literature

### Theoretical studies:

Economists and researchers have been worried about inequality for a long time. Inequality can cause social unrest, uproar and revolutions which have caused many empires to fall and civil wars. These are floating examples, but inequality has many advocates. Some believe inequality is a necessary evil if there is to be incentive to make economic progress. If you are rewarded with nothing extra it is in human nature to exert minimum energy if there is no dangling carrot promising a return on your added effort-investment. Incentives are the core of a market economy, and its power has been shown clearly when former communist and totalitarian regimes have changed paths and started reforms. One can argue that everyone should have the same, Karl Marx's theory, but in spirit of the same argument of fairness there should be increased rewards for those who do not shirk. Inequality is today a part of society which makes it interesting to study and research the determinants of the unequal distribution of wealth. The first economist who postulated a formal idea on income distribution was Simon Kuznets in 1951. With his paper, "Long-Term Changes in the National Income of the United States of America since 1870", and his further work he developed his ideas of which most famous is the Kuznets curve. His work on income distribution and inequality merited a Nobel Prize in Economics in 1971. The Kuznets curve is a thought path, often graphed, on how income distribution moves with economic development. He thought that initially inequality would rise as until it hit a certain thought level of income and after that inequality would decrease. Depicting this graphically results in an inverted u-shape now known as the Kuznets curve.

Enthused by Kuznets hypothesis, Greenwood and Jovanovic (1990) developed a theoretical model linking financial development to growth. By using this model they find a result reminiscent of Kuznets curve. They create a theoretical model in which individuals can invest in two different technologies, safe or risky. As the economy grows, they allow room for financial intermediaries who charge a lump sum for entry. Financial intermediaries allow for better allocation of capital, and once you enter you would never leave because the diversification of risks return on average better than by not using an intermediary. Initial wealth plays a part here, but savings also aids because of this lump sum that needs to be paid. As the economy evolves financial intermediaries get stronger which in turn increase economic growth. Initially economic

growth is slow and intermediaries small, but as the economy picks up pace they evolve and they prove that intermediaries cause economic growth. This widens income inequality, disperses the income distribution, until maturity of the economy where there is a stable income distribution. This prediction, similar to that of Kuznets, of an inverted U-shaped path of inequality is contested by other theories such as that of Galor and Zeira (1993) and Banerjee and Newman (1993) which we now turn.

Both theories come up with a negative linear relationship between financial development and inequality over time. Starting with Galor and Zeira (1993), they argue that inequalities persist as a result of different original endowments of wealth. Their model has two time periods where in the first period an individual can invest in human capital and work as skilled labour the next period. If one does not invest in human capital, i.e. education, one would work as unskilled labour in both periods. At the end of the second period the individuals leave bequests to the next generation after consumption. They argue that unskilled workers will leave fewer bequests to the next generation than their educated counterparts. As investment in human capital is expensive, the initial wealth of a person in time period one determines whether the person will invest in human capital. They assume workers to be homogenous, so only those with initial wealth will pursue human capital ventures and thus reinforcing the income distribution. Financial development offers over time more options for unskilled workers and through this they make the prediction of a negative linear relationship between financial development and inequality.

Whereas Galor and Zeira (1993) model depend on investment in human capital, Banerjee and Newman (1993) focus on the impact of financial development on individuals' access to capital. Through financial development, market imperfections disappear and then financial markets are closer to perfecting allocation of capital and access to credit for all parts of society. Banerjee and Newman (1993) model has three employment scenarios, working for a wage on a contract which they deem possible only when there is sufficient inequality, second as self-employed, which is possible if you have some human capital and credit access, and lastly as an entrepreneur. Their model predicts that initially only the rich can become entrepreneurs because of access to credit and original wealth is intertwined. Poorer people will then choose to have a wage, but not become self-employed because the lack of access to credit. Self-employed are so better off than the poor, but still see their limitations because of imperfect markets. The effect of improving

financial markets are thus seen to have mitigating effects on inequality and there is, according to their model, a clear negative effect on income distribution resulting from better access to credit for all.

Having looked at the main theoretical contributors to this field, we now turn to empirical studies who do not agree fully either.

### **Empirical studies:**

Recently there has been a lot of empirical research done when it comes to financial developments impact on inequality and income distribution. The World Bank, Eurostat and other big institutions have taken a great interest in this which has channelled a lot of funds and research in this direction. Consequently there is a big amount of data made readily available.

There are a couple of papers which has made it their aim to test the three before mentioned theories, Clarke, Xu and Zou (2003), Beck, Demirguc-Kunt, Levine (2007), Kappel (2010), Jauch and Watzka (2011-12). We will look at them, and their methods in turn before we turn to some papers on validity of variables used, Beck, Demirguc-Kunt, Levine (2009), Cihak, Demirguc-Kunt, Feyen, Levine (2012) and in the end a paper on European Union inequality, Bonesmo Fredriksen (2012), and EU and Eurozone inequality which is the main focus of this paper.

Clarke, Xu and Zou (2003) set out to test Greenwood and Jovanovic (1990), Banerjee and Newman (1993) and Galor and Zeira (1993) theories empirically by using a panel data approach of 91 countries over the period 1960-1995. They use the natural log of the Gini Index regressed on a set of variables. As a measure of financial development they focus on credit to financial intermediaries over GDP as an indicator. This is in line with other research on growth and economic development. Having a squared version of this term allows them to test for the non-linearity outcome predicted by Greenwood and Jovanovic (1990). The results show that there is a non-significant effect, size and sometimes positive sign associated with the squared term making them conclude that the inverted U-shaped relationship theory does not hold. They do on the other hand give credit to some of Kuznets theory, when it comes to the size of agriculture versus the modern sector having an effect, showing that having a bigger modern sector seems to have

weight. Their results seem to confirm the theories of Banerjee and Newman (1993) and Galor and Zeira (1993) of a negative linear relationship between financial development and inequality.

Beck, Demirguc-Kunt, Levine (2007), in their paper, go further in detail and set out to look at how financial development directly impacts the poor. As a more policy driven paper, they aim to show just how much financial development helps in reducing inequality. They acknowledge that they do not come up with direct policy measures, but they prove what they set out to do. Namely, through their work, to show that the poor (measured by the bottom quintile) are disproportionately aided by financial development. Their result offers an important insight into economic growth theory, where it is usually focused on inequality's negative impact on growth. As opposed to having redistributive taxations to promote growth, promoting financial development can in fact alleviate inequality whilst backing growth. By first showing that finance helps passed just its impact on growth, they find that 60% of the financial development is directly impacted by economic growth, whereas the remaining 40% comes from increase in equality. Their paper adds to the literature in favour of Banerjee and Newman (1993) and Galor and Zeira (1993) models and through examining more than the Gini coefficient they arrive at deepening results compared to Clarke, Xu and Zou (2003).

Kappel (2010), show that stock market development has a small but significant effect on poverty and income distribution. This adds to the literature and proves interesting as stock market development is usually associated with aiding the richer as the poor usually do not enter directly. On the other hand, financial development is about a better allocation of resources which the stock market facilitates. Thus making financial intermediaries become more efficient rendering their result not so surprising. Furthermore she finds proof for reduced inequality due to more developed loan markets, which adds to previous writings. Through utilizing a different set of control variables she also finds grounds to say that ethnic diversity and land distribution are determinants of both income inequality and poverty. Land distribution returns back to the wealth argument which has been established already to impact inequality. The discovery that ethnic diversity can cause inequality is in line with other studies which hypothesise the difficulties in providing public goods as a possible reason. Lastly she finds that government spending in high income countries tends to reduce inequality, whereas in developing countries there is no such

significance. This result follows logic of a more mature government redistributing wealth and providing more public services than your typical developing country.

Jauch and Watzka (2011-12) oppose the previously discussed empirical work and lend their support to Greenwood and Jovanovic (1990). Using a huge unbalanced dataset including 138 countries they adjust for within country specifics to show that financial development increases inequality. The big difference in approaches lies in the use of time-invariant country specifics offering a different view from between country specifics used in Clarke, Xu and Zou (2003). The positive impact of financial development on inequality that they found is going against much of the empirical work done to date, and is why they have gone through extensive robustness checks to validate their findings. They also find evidence of something reminiscent of a Kuznets curve though at very low levels of financial development. Jauch and Watzka (2011-12) do recognise the possibility that financial development through economic growth increases income across the income distribution, but stay adamant that the individuals that already are better off gain more because of the increase in inequality. Their paper sheds a new light on the impact of financial development and urges a new look on potential policies aimed at reducing inequality whilst increasing growth. For more insight into policies see the OECD's working paper series named "Less Income Inequality and More Growth – Are they Compatible? "

### **European Inequality**

The above theoretical and empirical work sheds a broad but somewhat inconclusive light on financial developments impact on inequality and the income distribution. This thesis aims to look at similar questions, with the original Eurozone eleven members as our sample, to see what effect financial development has had in the last 12 years. Before we turn to the empirical framework of this thesis we should look very briefly at some papers dealing with inequality in Europe. As far as I am aware there have not been many studies on financial developments impact on inequality in the Eurozone though the countries will have been included in earlier works discussed above.

Bonesmo Fredriksen (2012) finds evidence of increasing inequality in the original EU 8. When broadening the approach to encompass the whole of the European Union she finds the same results, though at a slowing pace since the year 2000. She constructed an aggregate measure of inequality for the whole of the EU and found that it was smaller than the US. This is expected as

there is a bigger focus on redistribution through taxes and other policies in the EU as opposed to the US. There are some variations in her sample though, some countries have reduced inequality through a catching up effect but this has been outweighed in overall inequality with the addition of more countries to the EU.

Main papers on inequality in the EU and the Eurozone aim at policy measures to reduce inequality. Thus the research conducted is often based on micro data such as household surveys such as Papatheodorou and Pavlopoulos (2003) and Rodriguez-Pose and Tselios (2009). Both papers come to the conclusion that the bulk of European inequality comes from within country inequality, 92% and 80% respectively. Rodriguez-Pose and Tselios (2009) use spatial data analysis on income per capita and relating it to inequality by subgroups. They find interestingly those regions with comparable earnings conditions cluster throughout Europe and are not tied by national borders. Expectedly they also find evidence of lower inequality in northern Europe as opposed to south and that cities appear to have higher economic development. Papatheodorou and Pavlopoulos (2003) elect to decompose and analyse data on subgroups such as countries and regions to break down inequality in the EU. They come up with numbers on how much each country contributes to inequality and explain it through their analysis which includes welfare state regimes.

Dauderstadt and Keltok (2011) point to difficulties in measuring inequality in Europe, and cite the vast differences in country wealth and size as the main problems. They argue that Eurostat vastly underestimates the level of inequality in the EU. Although the EU has worked hard on standardising household surveys across nations, there are still issues in comparisons because some countries focus on expenditure instead of income in the surveys, luckily there should not be discrepancies in this author's data as all countries adhere to the same standards. Additionally they highlight the classical problems of biasedness in responses as a consistent problem contributing to underestimation of inequality. The biasedness comes from richer individuals tend to not answer, and when they do, they are inclined to undermine their true wealth because of tax reasons. On the other hand the poorest part of the population, the homeless, are neither covered because of obvious problems with mailing surveys, and handing them out would eliminate the random selection. A further issue they have is the conversion of income into a single currency to compare different countries. This problem does not exist as all the countries in our sample data

are using the Euro, and any miscalculation is to US Dollars will be consistent across our sample data. Despite their claim that the true level of inequality is immeasurable, the Gini coefficient is the measure this author will use as a dependent variable. As Dauderstadt and Keltek (2011) do not indicate numerically to which degree the Gini is wrongly portraying inequality, there is no choice but to continue the use until a new measure comes along. Lastly they set out a list of policies they mean should be implemented to combat EU inequality. Of the many, one is worth signalling out, which is their proclamation that there should be higher tax levels and stricter regulation on financial markets to avoid bubbles. Stricter regulation on markets we will see in chapter 5 could actually have an adverse effect on what is the intended.

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## Data

This section will describe the data and the variables used in the regressions. There will be a description of the data followed by a justification for using said data for all variables.

Starting with the dependent variable, the Gini coefficient, which is the inequality measure used in this thesis. The Gini coefficient in the data is multiplied by 100 to make interpretation clearer after the regression is run and is the common way in which the coefficient is presented in indices. So in our set the Gini can go from zero to one hundred. Where zero represents complete equality, i.e. everyone has the same, and one hundred, where all funds are in the hands of one individual, complete inequality. It is calculated as the ratio the area between the Lorenz curve and a 45 degree angle to the whole triangle. The Lorenz curve is a curve generated through aggregating income shares in different income cohorts from poorest to richest. For more detail please see Lorenz (1905). The Gini coefficient is thus generated from this curve and was first used by Corrado Gini (1912) which is where it derives its name from. The Gini is a common measure used in empirical literature in the field of financial development and economic growth, and is why this thesis has elected to use it as well. The Gini coefficient measures the level of inequality looking at the whole distribution of income. It is as such a good variable for seeing in-/decreases in overall disparity, but further measures are needed to e.g. see how the bottom decile or top decile is affected, as done in Beck, Demirguc-Kunt, Levine (2007). The Gini data is gathered from Eurostat's<sup>3</sup> database online and is based on "equivalised" disposable income (see the Gini coefficients by country and year in figure 1). That means that the incomes are adjusted to be equivalent in sense of living conditions, but it is unclear from their website if it adjusted for living costs and purchasing power parity. The source of the information comes from EU statistics on income and living conditions, which gathers information through surveys of private households and includes every member of the household above 16. The thorough collection and work together with the reputation of the institution convinces me that the data is valid and should hold up well in comparison with other papers. This thesis elects to use the Gini coefficient as in Jauch and Watska (2012-13), Kappel (2010) and Liang (2006) instead of the natural logarithm of the Gini used in Clarke, Xu and Zou (2003) or the growth rate of the Gini as in Beck, Demirguc-Kunt and Levine (2007).

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<sup>3</sup> Eurostat is the statistical office of the European Union



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