Microfinance in a macroeconomic context

- An impact analysis

Handledare: Författare:

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ABSTRACT

The purpose of the thesis is to investigate a possible link between financial sector development through microfinance and economic growth in low income countries. The microfinance sector has been able to reach poor clients, earlier considered "unbankable" and is now increasing the financial services in these countries by including the poor. The hypothesis of the paper is that this leads to an expansion and a further development of the financial system, which in turn leads to economic growth. First, the theoretical link between the financial system and economic growth is investigated and established. Second, a theoretical framework linking the microfinance sector and the financial system is built. Last, the hypothesis is empirically tested in a regression analysis. Included in the regression is a set of control variables considered to be robust when testing economic growth. The independent variable is total microfinance portfolio holdings, MFI, drawn from the webpage MixMarket.org. The result was rather discouraging, since the MFI variable did not have any significance on economic growth. Of the control variables, only inflation did not turn out significant as expected. The result does however support the common belief that the MFI sector might be too small to have a visible impact on economic growth.

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1. INTRODUCTION

1.1. PURPOSE OF THE THESIS

During the last decade the interest for microcredit institutions and the broader perspective referred to as microfinance has increased. The microfinance institutions, further on also referred to as MFIs, e.g. banks and non-governmental organizations (NGOs) began the operation through the provision of credit to poor entrepreneurs, which now has evolved to include savings, insurances, housing loans and other financial services. The MFIs are most generally found in low-income countries where the formal financial sector is at large underdeveloped and where the commercial banks have been reluctant to enter.

Resent published theories have been aimed at establishing a link between the development of the financial sector and economic growth, arguing that the long run growth rate of a country is correlated with the state of the financial sector. Thus by improving the different components found in the financial system, the growth rate would thus increase (Levine 2004).

Turning back towards MFIs, if the market failures found in the low-income countries are overcome by the MFIs, it could be argued that the financial system has been developed. In interpreting the link between finance and growth introduced above, the following assumption would be that microfinance via developing the financial system has an impact on economic growth.

1.2. THESIS QUESTION AND OUTLINE

The general purpose of the paper is to study and explore the linkages between microfinance, finance and growth and to find out whether microfinance institutions have any part in achieving economic growth in the low-income countries.

The main task of this paper is to answer the following question:

- *Is there any impact of microfinance on long-run economic growth?*

The thesis question or hypothesis is originated from adding two postulations concerning the financial system. The two postulations are stated as follows:

1) Microfinance expands the financial sector
2) Financial sector expansion leads to economic growth

Both of these assumptions are to be examined in the paper in order to see if the supposed relationship holds or not.

In the first part of the thesis the reader will be introduced to the role finance in economic growth and the scientific debate over its importance during the last century is reviewed. Then, the characteristics of the financial system is discussed where the different components that makes up the financial system are look at more closely.

In the following part will introduce the reader to economic growth and why economic growth is considered to be of importance. Further on in the section a simple outline of the most basic endogenous growth model is constructed. This will add to the understanding of economic growth and what impact the financial system could have upon generating more growth. The last part of the section is devoted to discussing the relationship between the different components in the financial system and the economic growth mechanisms. This will clarify in what way financial sector development is related to economic growth.

The paper continues with chapter 4 in which a discussion about the limitations of the financial sector in the developing world is conducted and the market failure theory is introduced. The particular problems with the financial market are discussed in this section and why they are enhanced in the developing world.

Next the reader will be introduced to microfinance and how the MFIs tackle the market failure problems in the developing countries. Given the size of the thesis and the scope of it, the microfinance institutions will only be shortly discussed, since it is only necessary to know the general and basics of the various MFIs operations. The chapter will end by a review of the latest empirical studies trying to link MFI performance to the macro-environment, which also it the intro to the empirical part of the paper. In the last part the thesis question will be empirically tested, the result presented and then discussed in the conclusion.

1.3. DATA AND METHODOLOGY

The data collected from the Mix market internet platform and the World Bank indicators database is presented in section six. The analysis conducted is a multiple regression, which allows for several variables to be processed. The regression is outlined in chapter eight and the analysis presented later on in the very same chapter.

1.4. LIMITATIONS

Seeing that the literature regarding this special link is very sparse, or almost nonexistent, the thesis will first try to establish a theoretical framework which largely builds upon the resent work concerning financial development and growth of Levine (2004) and of work regarding the impact of macro-environment on MFI's by Ahlin et al (2010). The idea of the paper is also inspired and influenced by the MFS-study conducted by Emma Svensson at Lund University in 2007.

2. THE FINANCIAL SYSTEM AND ECONOMIC GROWTH

The role of finance in causing economic growth and development is being more and more recognized as an important one. United Nations dedicated the year of 2005 entirely to the importance of including poor in the financial sector and providing even the poorest of the world with access to financial instruments (yearofmicrocredit.org). The growing literature on this subject has shown that access to credit changes the livelihood of the poor. It has also been shown that there exists a link between the development of the financial system and economic growth. This aspect has been picked up by several of the donor agencies and NGO: s, who now having access to finance as one of the most fundamental goals.

This section will put forward the previous and current thinking on why and how the financial system affects growth. This will clarify why expansion of the financial system is important.

The chapter starts by a review of the literature concerning the relationship between the financial market and economic growth. Then the characteristics of the financial system are determined, describing the different components of the financial sector. Finally, the chapter ends with a small summary with connections to the next section.

2.1. THEORY ON THE FINANCE AND GROWTH LINK

The relationship between the financial sector and economic growth has been widely debated amongst economists. Some has stated that the financial system is crucial to propel economic growth; others have stated that it is the other way around, arguing for the importance of growth for the financial system. There has also been some declaring that the influence of the financial system on growth is exaggerated (King, Levine 1993).

Traditionally however, there have only been two clear-cut schools of thought concerning the impact of the financial market. The first one has been upholding that the differences in the quality of the financial systems are directly causing countries to grow at different rates, whereas the other school of thought considered the financial system as a consequence of minor importance with reference to growth compared to other factors (Levine 2004).

One early advocate for the significance of developing the financial sector to promote growth was Joseph Schumpeter. In 1911 he argued that in order for a country to proceed with development, a process of "creative destruction" needed to take place. The idea was that innovation and inventions replace old technologies, goods and services leading to a continued improvement and development. In order for this creative destruction to operate, the financial services needed to be in good shape. Otherwise, necessary transactions, risk managing and savings mobilizing would not take place, thus undermining the entire process (Schumpeter 1911 in King and Levine 1993).

Hicks (1969 in Levine, 2004), was another supporter of the importance of the financial system. However Hicks argued from a different point of view. According to Hicks, the industrial revolution would never have taken place without the innovations of the capital

market. The long-term investments made at that time depended on the management of savings in order to lessen the time related risk. Without the possibility to reallocate savings, Hicks conclude that the rate of innovations would not have been as high.

The opposite standpoint was taken by economists like Lucas, Robinson and Kuznets. Lucas (1988 in Levine 2004) stressed that the importance of the financial system was not to be exaggerated as he claimed some economists did. Kuznets and Robinson, both of them very prominent in the field of development economics, did not recognize finance in development at all. Robinson (1952 p.86 in Levine 2004) made a now often cited statement where he proclaimed that "where enterprise leads finance follows"; suggesting other factors were of more importance then the state of the financial system. This view supported the division of the financial sector and the real sector withheld by many economists at that time, maintaining the notion that demand for financial services proceeds supply of them and therefore finance could not cause growth.

In the late 1980s and the early 1990s, the economic growth field widened, which led to an expansion of models trying to explain growth. The endogenous growth models that arose amplified the definition of investment to include human capital and also made room for externalities. Romer (1987 in Jones 2002 p.157-159) was one of the first to assess the constant or even increasing returns to investment, which indicates that the financial sector is of great importance seeing as an increase in the rate of investment leads to a permanent increase in the economic growth.

Today the question of interest is not whether or not financial sector development is important for economic growth, but rather how important it is and how the causality goes. Is finance really causing growth or it growth causing finance or does finance cause growth only after a certain point?

One conclusion offered very early by Hugh Patrick (1966 in Todaro, Smith 2009 p.751) was that causality may run in both directions at different phases. Patrick brought about a "stages of development" point of view, where at the first stage financial development leads to economic growth, but as soon as the financial system is in working progress it generally follows the real sector.

This notion is slightly modified by Greenwood and Jovanovic (1990 in Levine 2004), showing that a poorly developed financial sector displays slow economic growth. But when the growth rate increases, the financial market expands leading to more effective resource allocation and thus higher economic growth.

King and Levine (1993) have found evidence that point in a one-way causality. They suggest that the future rate of long-run growth is reflected by the predetermined component of financial development. It is therefore possible to predict the size of the growth by knowing how the financial development is proceeding. This on the other hand indicates that it is the financial development that leads the economic growth. A highly developed financial market,

indicating high efficiency, lead to faster growth rates. With this comes better physical capital accumulation and allocation. The correlation exists throughout a variation of measures and the result is still robust when including more explanatory variables.

Levine (2004) concludes that the current research on this subject can be ordered into three final postulations. First, countries with better working markets and banks experience faster economic growth. Second, these conclusions seem not to be propelled by any simultaneity bias. The third point made from the existing research is that the financial constraints carried by firms and industries are eased by better financial services, meaning that there is in fact a positive link between developing financial systems and growth.

Before turning to the empirics behind these theories presented a comprehensive discussion about the components in the financial system is necessary. In order to continue with the analyses the different aspects need to be understood and debated.

2.2 CHARACTERISTICS OF THE FINANCIAL SYSTEM

Primarily, the financial system provides a way to allocate resources over space and time in an uncertain environment, and thus smooth the friction that may occur on the market. The friction is partly due to difficulties in collecting information, enforcing contracts and high transaction costs (Levine 2004). There are several classifications concerning the services of the financial system, but in short the intermediaries include; provision of payment services, savings generating, credit allocation, risk pricing, as well as pooling and trading (Todaro, Smith 2009 p.751).
The provision of payment services has led to less cash being carried around. In the modern economies almost everything is possible to purchase with a payment card provided by the banks, making payment more efficient (*ibid.*).

The different characteristics and components of the financial sector mentioned above are classified in different ways depending on the author.
Here the five points made by Levine (2004) fits very well in the framework of developing financial systems, hence developing growth[1].

Box 1: Financial system components

• Produce information ex ante about possible investments and allocate capital
• Monitor investments and exert corporate governance after providing finance
• Facilitate the trading, diversification, and management of risk
• Mobilize and pool savings
• Ease the exchange of goods and services

Source: Levin, 2004

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[1] Another classification of the features is provided by Todaro, Smith, 2009, p.751-752.

2.2.1. FINANCIAL SECTOR COMPONENTS

Producing information and allocating capital

For the individual the cost of collecting, processing and evaluate necessary information in order to make an investment could be very high. Since most individuals are risk averse the lack of information may lead to fewer investments. This also is applicable to the behavior of firms. The role of the financial system as a gatherer and distributer of information is to reduce the high costs associated and enhance the efficiency of the market. (Levine 2004). Banks monitor prices on stocks and bonds in the media, reflecting information and opinions of thousands to millions of investors. This makes it easier for them to make decisions about investments and allocation of capital towards the best yield of investment (Todaro, Smith 2009 p.753)

Monitoring firms and exerting corporate governance

Entrepreneurs and project managers have an information advantage because they know more regarding their innovation, invention or project and how favourable the outcome looks. This asymmetry of information may discourage investments and also savings. By having a well-functioning financial system, the banks monitor the borrowers and the shareholders control the banks by voting to replace bad managers, thus reducing the problems (Levine 2004).

Risk amelioration

The banks and the stock market also open for diversification of risk, a concern correspondingly handled by the insurance sector in the modern financial market. Moreover, recalling Hicks argument, the financial sector is crucial in order to improve the asset liquidity when long-term investments are being made (Todaro, Smith 2009 p.753).

Pooling of savings

With a better financial market the possibility of receiving a loan in order to make investments is greater, since other household's savings are made available for lending. The banks and other actors on the financial market offers more efficient outcomes then would have been possible if the investor was to save the entire sum of investment beforehand, or to borrow from the family or an informal moneylender (Todaro, Smith 2009 p.751).

Easing exchange

Another aspect of a well-functioning financial sector is the specialization opportunities created by directing investment funds to the investment yielding the greatest returns. The easier the transactions and the more efficiency on the market, the more likely is the specialization of the labour force leading to innovation and growth. This was the notion of Adam Smith a few hundred years ago, although old, still relevant when analysing the financial markets today (Levine 2004).

In every financial market all over the world these functions are found, however the quantity and quality of the services differ with the country. The influence of the financial system on the economy as a whole is directly linked to how well the five functions are produced. When speaking about the development of the financial system these aspects are to be regarded. By improving any of these five points financial development is performed. Better information as well as cheaper mechanisms for dealing with risks and enforcing contracts might lead to a change in how decisions about investment and savings are made and when they are made. Influences of that kind may also have an impact on the economic growth, even if only one of the points is improved (Levine, 2004).

3. ECONOMIC GROWTH AND THE FINANCIAL SYSTEM

This section will begin with a short introduction to economic growth, giving an overview of the importance of growth and how to measure it. It then carries on with an outline of a simple endogenous growth model used to "pin point" the exact variables causing growth in the equation. After having identified the variables causing growth in this model, the aim is to connect them to the different components of the financial system, examined in the previous section. This will promote the understanding of the underlying mechanisms affecting the financial system and therefore also growth.

3.1. DEFINITION OF ECONOMIC GROWTH

Economic growth is defined as the increase in a country's Gross Domestic Product, GDP from one year to another. Seeing that GDP is a measure of the value of the total productivity in a country it therefore illustrates the total national income, - the wealth of a country. The economic growth is always displayed a percentage of the annual change in GDP and indicates how fast the wealth increases (Hansson 2010).

However, the annual growth rate may fluctuate depending on where the economy is situated in the conjuncture cycle. If the economy of the country is experiencing some bad years, the growth slows down and can even become negative. The opposite then occur when experiencing some good years. The size of the conjuncture is measured as the total divergence from the potential GDP, which is an estimation of how the economy would have grown if no conjunctures accrued (Hansson 2010). Because the conjuncture fluctuations only reflect resent policies or shocks it is necessary to leave them out when trying to understand growth and determining what causes growth in the long run. For this reason economic growth is seen, in the long run, as a change in the potential GDP. In the economic growth literature and when modeling economic growth it is consequently the long run potential GDP that is being used (*ibid*).

The effect of economic growth on a country is modeled by the production possibilities curve. The model assumes two goods in a country and the production possibility curve or frontier, shows the different combinations of producing them given that the country uses all of its resources efficiently. Introducing economic growth will lead to a shift in the production possibility frontier, outwardly if growth is positive or inwardly if the growth is negative. An outward shift means an increase in the amount of the goods potentially produced, meaning an increase in the factors of production which is either capital or/and labour (Todaro, Smith 2008 p. 143-144).

Figure 1: Economic Growth and the Production Possibility Frontier

Source: http://easyappraochtoeconmics.blogspot.com/
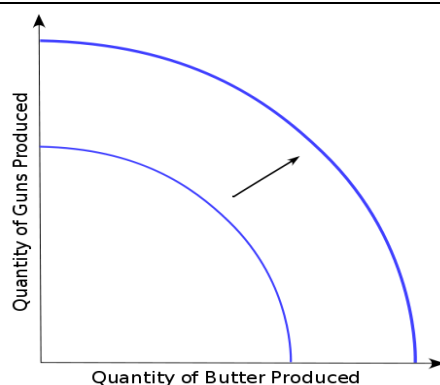
3.2 SIMPLIFIED ENDOGENOUS GROWTH MODEL

The endogenous models of economic growth, also referred to as the new models of economic growth are models trying to include variables explaining growth that were left out in earlier models.[2] One of the simplest endogenous growth models is the AK-model, more formally known as the Harrod-Domar growth model, where the growth rate is a linear function of the aggregate capital stock. The country's production function is then set to:

$$Y = AK \quad (1)$$

As individuals save (S) and invest (I) the total capital stock (K) builds up, this in turn generates output in the economy. By first assuming that the variable A, the overall marginal productivity of capital, is a positive constant, the only impact on growth is K. Since the capital stock determines the output, a change in the financial intermediaries will then directly affect the growth rate of the country (Jones 2002 p.157-159).

Thus providing: $\Delta K = I = S$ (2)

Furthermore, in order to simplify the model some assumptions can be made. The first one being that there is no population growth, which indicates an interpretation of only one person populating the economy. The second assumption is that there is only one good produced in the entire economy, denoting all of the resources to the single good either for consumption or for investment (Bailliu 2000).

Hence total savings leads to total investment, which in turn increases the capital stock thus impacting the level of growth. However, the total amount of savings is not directly or entirely transformed into investment. Since the financial sector is handling the conversion of savings into investment, a fraction of the saved amount is absorbed by the sector as payment for the services.

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[2] For a review of the basic exogenous model (the Solow model) see Charles I Jones 2002 p.22-26

The part of savings funneled into investment is denoted ϕ, and each unit taken by the financial sector thus becomes $1-\phi$ (Bailliu 2000).
The financial market then gives us the following (in equilibrium):

$$\phi S = I \quad (3)$$

However the capital stock is also depreciated over time. The forth assumption leads to an inclusion of the depreciation rate δ, over a given amount of time (*ibid.*).
By putting together all of the information above the change in output- the growth rate (g) - is then developed to this equation:

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

The final equation (4) displays the basic logic in the simplified AK-model of how to accomplish a steady-state growth rate (Bailliu 2000).
In order to grow the country is required to save a certain proportion of the GDP, which then is to be invested. Larger savings gives larger investments which in turn lead to a faster and higher growth rate.

3.3. FINANCIAL COMPONENTS AND ENDOGENOUS GROWTH

The simplified endogenous model above is provided in order to disclose the earlier discussed link between the financial sector and economic growth. In section 3.1.2 the different components of the financial sector was examined, since a full comprehension of the financial system is beneficial when discussing how the development of the sector takes place. In this section the model and the development of the specific components will be tied together thus trying to explain in detail how the components can improve and what difference it makes in developing the financial system.

Produce information on possible investments and allocate capital

By developing financial services, like banks, distribution of information becomes easier and more efficient investments are made possible. For an entrepreneur, it is of greatest importance to obtain the funds necessary to proceed with the project. However it is very costly for the single entrepreneur to seek, obtain and process the information needed to find financiers, which could result in the project dying before it is even started. Since banks will bring forth more information than the single entrepreneur and capital is assumed to be scarce, the financial market will allocate the capital to the most promising firms, hence producing a more efficient allocation (Levine 2004).

Greenwood and Jovanovic (1990 in Levine, Demirgüç-Kunt, 2009) also argue that with low levels of development the access to financial intermediaries becomes more costly, due to a high fixed cost to joining in, thus holding the growth level down.

By including more people in the financial sector the fixed cost would be lower and the allocation efficiency would also improve leading to higher growth rates and more individuals getting access to better returns on investments, since the lack of financial intermediaries will lead to the a distortion of the investments of the entrepreneur. However the catch is that in the developing world the poor prospective entrepreneurs are prevented from joining in since it is too costly. Thus low income level and low wealth hinder talented poor from becoming entrepreneurs. Consequently, the overall level of efficiency as well as the growth rate is being slowed down by credit constraints (Levine, Demirgüç-Kunt, 2009).

Banerjee and Newman (1993 in Levine, Demirgüç-Kunt, 2009) confirm that well developed markets increases the possibility of a poor individual gaining access to the financial sector, thus meaning that the income level then not becomes of greatest importance in the consideration of the project. They also show that in countries with a generally low income level, where nobody can afford being an entrepreneur, everyone is engaged in subsistence self-employment. This will naturally lead to a very slow growth rate.

Acemoglu, Aghion, and Zilibotti (2003), shows that on the firm level, existing market friction causes the firm to face financing constraints. This will have severe impact on the decision making and the prospective activities in the firm. The lack of capital will thus shape the behavior of the firm since it might neglect innovating projects and adopting new technology. In effect, when the financial services of banks and other agents is developed, the financing constraint will be relaxed which will enable the firms to undertake innovative projects or to adopt recent technology. Consequently, the development of the financial sector has a firm impact on aggregated growth.

In addition to finding the best production technologies, banks and such agents may also be able to encourage innovation of new goods and production processes by finding and selecting the entrepreneur with the best probability of succeeding. '*The banker, therefore, is not so much primarily a middleman ... He authorizes people in the name of society ... (to innovate)*' (Schumpeter 1911 in Levine 2004).

In the endogenous growth model this affects A, the overall productivity of capital, as the banks get better at identifying the entrepreneur with potentially higher yielding project. The increase in A thus leads to an increasing growth rate, g (Bailliu 2000).

Moreover as the financial sector gains experience, the services will become more improved. The transaction cost of transforming savings into investments may therefore be reduced. Seeing as the size of ϕ is determined by the gap between the lending and borrowing of the bank, a more efficient financial sector will lessen that gap. Resulting in a bigger proportion of the savings being channeled into investments and consequently this will give lead to a raised growth rate (*ibid*.).

Facilitate the trading, diversification, and management of risk

Traditionally, cross-sectional diversification of risk has been the focus of finance theory. Banks and other financial agents provide the means to trade and lessen the risks associated with investing in and undertaking different projects. Through pooling the savings, the banks are able to spread the risk sharing which means that individuals are more encouraged to invest in riskier but higher yielding projects. In persuading individuals to direct the capital towards the projects with higher marginal return on investment, the overall efficiency is improved and higher rates of growth is generated (Bencivenga, Smith 1991 in Levine 2004).

The underlying mechanism is rather simple. In general savers dislike risk and try to avoid it as much as possible, which leads to investments in low-return projects that carries lower risk. If the financial market is functioning, the possibility of portfolio diversion naturally reduces the risk, since one default project has little impact on the entire portfolio. However if the financial market is underdeveloped, the possible investor faces the entire risk of the project. Consequently, since risk is something to avoid, the project and the investment will fail (Levine, Demirgüç-Kunt, 2009).

King and Levine (1993) show that this also has an impact on the adaption and creation of new technology. Diversification can encourage the entrepreneur to undertake innovative projects because of the risk being reduced. Therefore they conclude that the financial system, as a medium for risk managing can stimulate technology and hence growth.

The liquidity risk is another type of risk, which is related to transaction costs and information asymmetries. If the financial sector is characterized by high levels of moral hazard and adverse selection, the process of evaluation becomes very time-consuming and costly. By improving the financial sector and the services provided by banks and other financial agents, the uncertainty will be diminished and therefore also the liquidity risks (Levine 2004).

In countries with an underdeveloped financial sector, macroeconomic chocks can be particularly severe for the poorest. The consequences of the shock for the household income could be diversified away with a better developed financial system. In providing stable, long-term services the banks can help, especially the poor, smooth the risk by spreading it through generations. This is called intertemporal risk sharing, since it is diversified across time (Levine 2004).

One point to consider is offered by Levhari and Srinivaran (1969), who emphasize the income and substitution effects. If the financial sector is developed and both resource allocation and risk managing is improved, the rate of lending and borrowing is lowered. Therefore the incentive to save is lessened due to the development of the financial sector. Thus, in view of promoting economic growth the author argue that financial development could in fact lover the growth rate by a drop in aggregated savings.

Mobilize and pool savings

Levine (2004) divides the definition of savings mobilization, or pooling, into two different parts. The first part consists of mitigating the transaction costs of collecting the savings from various individuals. The second part encompasses the difficulties with information asymmetries when trying to collect the savings. Any sane individual will naturally not let go of its savings without making sure it is properly handled, therefore it is of great importance to overcome the information barrier. Seeing as it is a very costly process of gathering deposits, especially in sparsely populated areas, many developing countries are in the utmost need of developing the financial system.

The benefits of pooling savings are the exploiting of economies of scale, overcoming investment indivisibilities and the overall increased savings rate. In the endogenous model and equation (4), this indicates an increase in the savings, s, which in turn would affect the economic growth in a positive way by speeding up the growth rate.

However Jorgenson (1995 in Levine 2004) argue that the aggregated savings in itself does not promote long-run growth. It is the more effective allocation of resources that should be in focus. As mentioned earlier a better mobilization of savings can improve the allocation of resources, which has an impact on the growth rate.

Ease the exchange of goods and services

One of the functions provided by the financial system lies in easing the exchange of goods and services. Well-developed financial intermediaries can lower the transaction costs of each and every transfer, thus facilitating exchange. This is a prerequisite for increasing the specialization in a society. In addition more specialization, lead to more growth as argued by Adam Smith early in 1776. He stated that it is the division of labour that leads to more specialization and innovation. Accordingly, financial market development promoting the exchange of goods and services will create more productivity and economic growth.

In this chapter the reader was introduced to economic growth and the effects of growth on the production possibilities of a country. Since we wanted to draw a link between the financial sector and economic growth, the endogenous model in section 3.2. was simplified to fit the theoretical framework. The model thus provided a straightforward way to grasp which components of economic growth the financial system can influence. The chapter continued with a theoretical discussion of how each of the characteristics of the financial sector presented in section 2.2.1 could have an impact on the components in the economic growth model. The theoretical model implies that the impact of the different characteristics in the financial system, are quite strong even when they are considered individually.

The conclusion is that an improvement in one single factor would thus improve the economic growth rate. This might be a very small impact and impossible to measure empirically. However, when the financial sector is improved and developed, the impact on economic growth should be larger and therefore possible to measure.

4. FINANCE IN THE DEVELOPING WORLD

The financial markets in developing countries are not providing the above listed services in a very structured way or, in some cases, at all. The existing financial sectors are often highly fragmented, chaotic and dependent on external services. In fact, many of the commercial banks operating in developing countries are just overseas branches of multinational banks from developed countries (Todaro, Smith 2009 p.754). Under such circumstances the people getting services in the developing world are the rich elite of the country, leaving the greater part of the population outside the formal financial market. Especially the rural and poor are hurt by not having access to simple financial services, since they are required to turn towards the informal market where they are risking becoming exploited by moneylenders (Todaro, Smith 2009 p.755).

4.1 FINANCIAL OUTREACH - BANK ACCOUNTS

Statistics over bank accounts shows that in high income countries the number of accountholders is 2000 per each 1000 adult. Each person accordingly possesses two bank accounts. Comparing this to recent studies in Rwanda, Uganda, Malawi and Pakistan, the number of account holders is fewer than 225 per 1000 people. In the very bottom are five African countries positioned and all of them have fewer than 100 bank accounts per 1000 people. In the first study, the number of households saving in a formal institution was reportedly less than 20%. Contrasting this with the Netherlands where as much as 98% of the households supposedly use a commercial bank account (Kendall, Mylenko, Ponce 2010 p.23).

The data underlines the fact that in developing countries the access to finance is limited and there is a big portion of the population excluded from the financial sector. The differences shown in box 2, between the developing and the developed world are striking.

Box 2: Percentage of account holders

Method	Region	% of Adult Pop. Banked
Using reported totals only[3]	High Income	81%
	Developing	28%
Using reported and predicted[4]	High Income	86%
	Developing	31%

Source: Kendall, J, Mylenko, N, Ponce, A, Policy Research Working Paper 5253: Measuring Financial Access around the World, 2010.

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[3] The sample for *reported totals only* was limited to countries with reported account and household survey data (Kendall, Mylenko, Ponce 2010 p.53).
[4] The sample for *reported and predicted* includes countries with both reported and predicted household survey and account data (*ibid.*).

One point to be made here is the distinction between financial depth and financial access, since some of the most recent studies have showed that there are important and significant differences between them. To exemplify the differences, Demirgüç-Kunt et al. (2008) show that although Colombia and Lithuania display the same financial depth, about 20% of credit to GDP, the actual use of the services varies a lot between the two countries. In Lithuania 70% of the households have bank accounts while the number in Colombia is only 40%.

Hence the access to finance could be argued to be the most important factor in determining the function of the financial system. The section will continue with a discussion about the financial sector in the developing countries and determine the market failures found.

4.1. THE DEVELOPING COUNTRIES AND THE FINANCIAL SECTOR

One of the first principles in basic economics is the assumption of diminishing marginal returns on capital. This builds on the notion that with each additional unit of input, the output will be lessened, on the margin. An example often cited is the tailor buying an electrical sewing machine, which immediately increases his daily output making it possible to double the productivity. The tailor then gets a very high return on the investment. However when the tailor then buys an electric pair of scissors for the same amount of money, the output will not increase as much as it did with the sewing machine. This is based on the assumption that the tailor is being rational in taking his decisions and first buys the tool that gives him the biggest output. In the language of economics this feature is labeled diminishing marginal return on investment and is one of the most important basic principles (Armendáriz, Morduch 2010 p.6).

This example can be used to explain the assumption that the marginal return on capital for the poorer entrepreneur is higher than it is for the richer entrepreneur, implying that the poorer entrepreneur is willing to pay more for investment. Consequently, the capital should move from the rich to the poor, from North to South as investors always seeks the highest returns on capital. If this principle was to hold, there would be no transaction costs, no restrictions on how capital and technology can move and the productivity would more or less be the same everywhere (*ibid.*).

Unfortunately this is not the case. The market is imperfect on these aspects given the amount of hindrances, such as high costs of seeking and obtaining information, of creating and monitoring contracts (Armendáriz, Morduch 2010 p.7-8).

4.3. THE MARKET FAILURE THEORY

In this section we will look at hindrances that are examples of market failures which have kept the capital away from the poor. In areas where these difficulties have led to a particular scarcity of capital, microfinance has presented itself as a possible solution.
The most common market failures will be further discussed below and after that the different microfinance solutions are presented.

4.3.1 ASSYMETRIC INFORMATION

The two main reasons why banks, the traditional lenders, are reluctant to operate in poor areas are because of the problems with adverse selection and moral hazard. Adverse selection is often referred to as hidden knowledge, highlighting the issue concerning lack of perfect information on the market preceding the formation of a contract. Moral hazard on the other hand, is the hidden action of an agent. This related to ex-post limits of information, when the agent changes behavior after a contract is formed.
Both problems are connected with how risk is managed and this following section will explore to which extent risk is higher in less developed countries.

4.3.2 AGENCY PROBLEMS

Limited liability

In order to proceed with the analysis the assumption of limited liability is necessary. This is defined as the case when the repayment is restricted to the borrower's current income. If the borrower is poor, he or she will not have the collateral required by the banks as a security of the loan. From the perspective of the bank this is a high-risk borrower since the person has nothing to lose in case of default (Armendáriz, Morduch 2010 p.39-40).

Even if prospective borrower had collateral for the bank to seize, the weak legal framework in most developing countries makes it hard for the bank to act upon a defaulting.
In addition, the government may not want poor to become even poorer and may therefore take a stand against the bank. Many countries in the developing world have launched anti-poverty programs and would not like to see them fail. In short, the banks in developing countries are not going to lend any money if the borrower is able to fail the payments without having to hand in the collateral. Hence, the traditional banks do not conduct any business, leaving an opening in the market now being called for by microfinance (Armendáriz, Morduch 2010 p.40-41).

In addition to the assumption on limited liability the banks face further difficulties before even lending money. The problem with information strains, so called adverse selection, will be discussed below.

Adverse selection

One of the most common problems faced by commercial banks occurs even before the actual contract is formulated. Due to lack of information concerning the risk of the prospective lender, the bank has a hard time distinguishing between the more or the less risky client. Since the prospective client has bigger knowledge about his or her creditworthiness, the problem of *adverse selection* arises. The bank would like to discriminate against the more risky client but since the problem of information exists every potential borrower looks the same (Armendáriz, Morduch 2010 p.40-48).

This would lead to the bank charging every borrower a higher interest rate in order to protect itself from the defaulting clients. However this would drive away the safer clients since they probably would not like to pay a higher interest rate given that they carry low risk. As the process of disregarding the low risk clients goes on, the banks would then be left with the high risk clients, thus facing the danger of bankruptcy (*ibid.*). In the economic literature this is also referred to as the lemon problem[5], all lemons are considered sour.

In the developing countries the problem of adverse selection is combines with limited liability causing an even greater problem on the financial market. The solution for the banks is to try to keep the safer prospective borrowers in order to pool them with the riskier ones so that the risk is reduced through diversion. This would lead to a lower interest rate for everyone, but it does require that the safe borrowers join in and cover for the riskier ones. When adverse selection arises the banks will reconsider if the risk of entering the market is worth the potential gain. In developing countries this occurs together with limited liability thus causing a very inefficient financial market (Armendáriz, Morduch 2010 p.40-48).

This is where microfinance comes in as a solution to the inefficiency as the access to the financial market is broadened to reach the ones considered to carry high risk.

Moral hazard

After the contract is formulated and the transaction has taken place another very common problem arises. Since the borrower now have the loan, his or hers behaviors might change in a way that affects the likelihood of repayment. Therefore *Moral Hazard* is the unobservable hidden action of a client after the receiving of a loan. This is a serious problem of the financial market, because banks cannot exert any control over the client's efforts of realizing the project, or of receiving the repayments (Armendáriz, Morduch 2010 p.48-51).

There are two types of moral hazard to be found, the *ex ante* moral hazard and the *ex post* moral hazard. The ex ante moral hazard relates to the issue of hidden actions taken by the client before the realization of the project returns. The actions taken by the client can be such that it affects the outcome of the project, in a negative way, thus increasing the probability of defaulting.
The ex post type on the other hand relates to the action after the project returns are realized. Because the limited ability to assert control over the client, the borrower can falsely claim that the project has defaulted. Seeing as the case of limited liability is high in developing countries, there is no collateral to seize in case of defaulting, making it easy to 'take the money and run'. Moreover, as discussed above, if collateral is provided for but no legal support is in place for seizing the collateral, the banks will probably not lend (Armendáriz, Morduch 2010 p.50-51).

The problems with asymmetric information mentioned above are lessened when collateral is offered. However in low income countries where collateral is scarce and transaction costs are

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[5] The lemons problem is further described in Todaro, Smith 2009 p.203

high, the commercial banks are naturally unwilling to lend. De Soto (2000 in Armendáriz, Morduch 2010 p.58-59) argued that the right way to deal with market imperfection is to establish clear property rights over land and other resources, which would improve the ability of the poor to offer collateral. However then the legal rights of a country is assumed to be well functioning which is rarely the case and could, as discussed above, go against the poverty strategies in the country (Armendáriz, Morduch 2010 p.58-59).

An understanding of all of these problems found in financial market has been enhanced by the overall low-income of the people in the developing countries. Since only a small share of the population has been able to provide any collateral in order to lower their risk, the commercial banks have chosen not to operate, thus leaving a great part of the world without proper access to finance. Microfinance has shown a way around these problems presented above and the next section will describe how this is done.

5. MICROFINANCE

Microfinance is the provision of small financial services to people without access to the formal financial sector. The supplier, generally a microfinance institution (MFI), provides services directed to the poor such as lending money, collecting deposits for savings and offering insurance. By requiring no collateral or very little collateral the MFIs has been able to reach and include the poor in the world, the "unbankable" (Todaro, Smith 2009 p.252).

5.1. GRAMEEN BANK – THE PIONEER OF MICROFINANCE

In the last decade we have seen a rapid growth of the Microfinance Industry with a boom of new lenders and borrowers all over the world. The 2006 Nobel Peace Prize was awarded to Mohammad Yunus a professor in economics at the University of Chittagong in Bangladesh. He is the founder of Grameen Bank and a pioneer in the Microfinance sector. This increased the world's interests in the possibilities of microfinance. Since then, an academic discussion has spurred on whether or not microfinance has an impact on poverty elimination or not.

Grameen Bank traces back to 1976 when Muhammad Yunus lent a minor sum of money to some women in the nearby village in order to help them out of a moneylenders trap. He realized that the high interest rates being charged by the informal moneylenders snared the villagers into a vicious circle of lending, repaying and then lending more to be able to pay for the interest rate. Yunus gathered that with lower interest rates the poor could lend money to material, sell their products and after repaying the loan with interest still have some money left. They would therefore rise out of poverty by their own means (Grameen-info.org 2011).

5.2. GROUP-LENDING

The Grameen model, the village banking model and the solidarity model found all over the world, are all based on the principle of group lending. The prospective borrowers form groups of five or more depending on the dominant model. In the Grameen case, only two persons per group were allowed a loan at first. If the loan was repaid properly and on time, the rest of the

group also qualified for a loan. All of the loans was given and repaid in a large village meeting, thus keeping the process very transparent to the rest of the villagers.

This created incentives for the group members to select borrower amongst themselves with the most potential and to oversee the progress of the business. The group could then help and cover for each other if something would go wrong, in terms of not being able to pay the weekly amortize. What this "peer-monitoring" entails is a transfer of costs, usually undertaken by the banks, to the borrowing group. First, the cost of screening and monitoring possible lenders is reduced when operating through group lending. Then, the joint liability lessens the risk of a lender to 'take the money and run'. This model therefore effectively reduces agency problems like adverse selection and moral hazard (Armendáriz, Morduch 2010 p.98-112).

5.3 INDIVIDUAL LENDING

The development of microfinance from group lending to individual lending has led to larger loans and in some cases the demand for collateral. However in comparison to traditional lending by commercial banks, the loans and the collateral sometimes required are still small. The individual lending is appealing in highly populated areas where clients are better off and the peer monitoring is harder to achieve (Armendáriz, Morduch 2010 p. 130-141).
The agency problems are thus limited by a somewhat different set of incentives then is found in the group lending model above

The method used is however dependent upon two factors. The first factor is that the borrowers cannot take on loans from another agency because that could increase the moral hazard. The second factor is a development of repeated relationships between the borrower and the lender, which permits the loan officer to screen the prospective client before agreeing upon a loan (*ibid.*).

If these two assumptions hold, the MFI could successfully threaten the client to stop lending if the repayment is missing. By dividing the loan into different periods, the punishment of defaulting is that the rest of the loan will not be handed out and the entire investment will fail. The breakdown of the loan into really small pieces will increase the incentives of repayment since the opportunity cost of defaulting will be higher than the net present payoff. Of course, this will vary with the interest rate charged thus making it hard for the MFI to set a too high interest rate (Armendáriz, Morduch 2010 p. 141-144).

In addition to this the MFIs could use the progressive lending model. This builds on letting the borrower prove his or her ability to by first issuing small loans, as the borrowers pass the test, the available loan size increases. From the MFI perspective this simplifies the screening of the clients before large loans are issued and lowers the administration cost of smaller loans. If the borrower considerers a strategic default, this will be conducted with the higher loan sizes, since the opportunity cost of taking the money and run will be too high with the smaller loan sizes (*ibid.*).

However by the time the bigger loans are issued, the prospective borrower would have had passed the "tests" of repaying the smaller loans, thus already made the necessary investments in order to conduct these repayments. Consequently, the return of the investment is ultimately what could cause the borrower to default. If the investment renders more than the MFI can offer in loan size the incentive to default is higher (Armendáriz, Morduch 2010 p. 143-144).

Another mechanism of microfinance used to disable the incentive of defaulting is the public repayments. Whether or not the repayments are conducted in group or individually between the loaner and the borrower is not of importance since it is the face-to-face meeting that enhances the repayment rate. Sobel (2006 in Armendáriz, Morduch 2010 p.144) argues that the borrowers concern of his or hers future reputation is what in fact mitigates the defaulting. But then again, as pointed out by Rutherford (in Armendáriz, Morduch 2010 p.396), the general rule of thumb is that people pay up when they are asked to pay and when not asked the repayment of a loan is neglected. Thus, the transparency and openly conducted transactions may serve as an instrument of reducing the agency problems.

This form of microfinance has emerged in urban areas where the population density is high and the advantage of group lending is lacking, but is now spreading to areas being sparsely populated where the cost of peer-monitoring might be high due to the emphasis on dynamic incentives (Armendáriz, Morduch 2010 p.138).

5.4. SAVINGS AND INSURANCE

The move from the term microcredit to the broader term microfinance is connected with the widening of the financial services provided by the MFI. The ability to save was first introduced on the broader scene of microfinance. In the low-income economies the market imperfection hinders people from saving due to the lack of effective and reliable ways to save. By improving the quality and quantity of the financial intermediaries, the savings rate should increase and have a positive effect on growth, because savings deposits increase the ability of the household (or firm) to proceed with investments and build up assets (Armendáriz, Morduch 2010 p. 171-174).

The provision of microinsurance is a fairly new financial instrument pursued by the MFI's. Some of the newly born insurances are crop insurance, property insurance, health insurance and life insurance. Life insurances have so far been the most successful ones, covering the outstanding loan in case of a sudden death (Armendáriz, Morduch 2010 p. 195-204).

The broadened provision of these financial services is seen as an essential step towards creating financial systems in the low-income countries. The pre-existing difficulty in accessing financial services has put ineffective constraints on the households in the low income countries leading to high costs of investment distortions (*ibid*).

5.5. SUSTAINABILITY AND SUBSIDY

The microfinance sector came with two promises, that microfinance can be profitable and deliver social development through a deeper outreach of financial services to the ones not assessing any. However the two promises does not always add up. There are still donor based MFIs surviving only thanks to subsidies form governments and other beneficiaries. Cull, Demirgüç-Kunt and Morduch (2009b in Armendáriz, Morduch 2010 p. 317-319) study show that 57% of the MFI's is financially sustainable, which is just above half of the MFI's. However the 57% serve 87% of all clients. Indicating that the bigger institution, the better financial independency (Armendáriz, Morduch 2010 p. 317-319).

The case for financial sustainability has been propagated by many, since subsidies are considered to remove the pressure for good management and operations effectiveness. The resilience on subsidies may also put a hindrance to how far the operations may reach and this is of great concern since the MFI's are supposed to promote access to the poor promising entrepreneurs not just few selected poor. However the microfinance institution BRAC has had collaboration with the World Bank which shows that subsidies can increase and expand the outreach (Armendáriz, Morduch 2010 p. 340-341).
Concluding, being dependent on subsidies requires good control mechanisms otherwise it might limit the scope of outreach and increase costs by ineffectiveness.

5.6. MICROFINANCE RELATIONSHIP TO ECONOMIC GROWTH

The link between microfinance and growth presented by Svensson (2007) draws on the simplified endogenous growth model presented in section 3.2. In the model the micro level market failure of the financial system is resolved by the MFI's thus assessing the financial services to the poor entrepreneurs as mentioned in section 2.2.1.
The effect on the economic growth rate is thus caused in the way the MFI's expands the financial sector, thus having an indirect effect of the exponents in the endogenous growth model: A, s, δ, ϕ (Svensson 2007).

In the endogenous growth model described in section 3.3 the development of the financial sector first of all affects the variable A, which is the overall productivity of capital. It increases with the entrepreneurs being able to invest more efficiently. The learning by doing effect of the financial system also affects A, in that the entrepreneur with the most prospective project is easier identified. The proportion of savings being channeled into investments, ϕ, is increased by a more effective financial sector, in which the MFI may contribute through promoting savings and investments in the financial services provided. Naturally this will also have an impact of the savings rate, s, since the risk of saving will be lessened through the microfinance institutions and here the insurances provided may increase the incentives to save. The conclusion is that if the outreach and the operation of the MFIs are large enough, the supposed impact on economic growth would be measurable.

5.7. EMPRICAL STUDIES ON MFIs AND THE FINANCIAL SECTOR

The literature found on microfinance has mainly put focus on two issues relating the microfinance sector. The first issue relates to the micro level household studies conducted, where the key focus has been on how to separate the average household from the ones receiving financial services from a MFI.[6] The second debate has concerned the subsistence and survival of the MFIs, trying to explain the differences in the performance of MFIs by commercialization.[7]

The literature concerning the macro-perspective on MFIs is now growing. The case study of Patten *et al.* (2001 in Ahlin *et al.* 2010) on Indonesian BRI shows that the financial crisis of the later part of the 1990's had very little impact on the repayment rates of the micro-loans.

In another study on the Indonesian microfinance sector, Henley (2009 in Ahlin, *et al.* 2010) argues that the success story is closely related to the displayed macroeconomic growth. The paper is built on historical robustness linking growth to the interest rates of the country.

Krauss and Walter (2006, 2008 in Ahlin *et al*. 2010) find that the performance of MFIs is more correlated with GDP levels then other emerging market banks, but less correlated with stock market indices when using MFI fixed effects. Gonzalez (2007 in Ahlin *et al*. 2010) also uses MFI fixed effects to find out which measures of MFI performance that matter the most and if portfolio defaulting risk is related to growth. He did not find any correlation between the most common measures of default and growth, thus implying that the macro-economic setting is of little significance for the MFI outcome.

This has been challenged by Ahlin *et al*. (2010). Their paper tests a wider set of macro-economic variables on the MFI performance. By regressing MFI performance-measures in terms of profitability and outreach on bank development variables and controlling for macro-economic variables, the authors do conclude that the macro setting indeed is important. The authors conduct a large analysis on the data from the MIX internet platform to test the correlation and conclude that several variables are significant for the performance of the MFI. Most importantly they found that GDP growth appears to have an important effect on the financial performance of the MFI and that advanced institutions seem to worsen the MFI operations.

The findings support the negative relationship between the formal financial sector development and MFI performance. In places where the formal banking sector has failed, the MFI reach more clients and perform better in terms of profits (Ahlin *et al.* 2010).

Consequently, this supports the general belief that microfinance institutions have found a way around the market failures that hinders the traditional banking sector form entering the market.

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[6] Armendáriz, Morduch 2010 p. 239-268
[7] Armendáriz, Morduch 2010 p. 268-316

Through the innovative form of contracts discussed in section 5.3. and the use of lending methodologies, the MFI has succeeded where the traditional sector have failed. The MFIs have increased the access for poor to the financial services and made it possible to operate and perform well on grounds that earlier was avoided.

Ahlin *et al.* (2010) does an attempt to address the issue of reversed causality, e.g. that the development of the financial sector through microfinance leads to growth. However they do not find it possible that the microfinance sector in a country affects any "significant" share of growth in the short run.

The empirical studies of Microfinance in a macroeconomic context have not rendered a lot to this date. Nevertheless the focus of this paper is to attempt to find out if MFI has any impact at all on economic growth in the long run and use current data which could be more extensive. Recalling the theoretical assumption, if the outreach is large enough the effect might be visible. The empirical test conducted in the next section will be very basic, focusing on the broad lines and therefore ignoring share of growth in favor of any significance.

6. EMPIRCAL ANALYSIS

The empirical set up is based on the model of Barro (1991) since most studies on economic growth follow this line. The section is disposed as follows, first the data is described and the limitation of the data is shortly discussed. Second, the variables included in the analysis are introduced with a short explanation of the impact of the variables on economic growth.

6.1. DESCRIPTION OF THE DATA

The purpose of the empirical analysis is to find out if microfinance has any impact on economic growth in low income countries. Therefore countries used in the analyses are the ones found in the low income or the low middle income groups, categorized by the World Bank. There are two exceptions to this; Albania and Kazakhstan. They are considered to be high middle income countries, but the microfinance data was very extensive on these two countries which led to an inclusion of them. All of the countries listed as low income countries or low middle income countries by the World Bank are not included, because the main focus has been good microfinance data. Consequently, the countries where the data on microfinance (or the data on the other variables) has been too poor are excluded from the analysis.

Box 3: Countries included

Countries included		
Albania	Guinea	Pakistan
Armenia	Haiti	Paraguay
Bangladesh	Honduras	Philippines
Benin	India	Rwanda
Bolivia	Indonesia	Samoa
Burkina Faso	Jordan	Senegal
Cambodia	Kazakhstan	Sri Lanka
Cameroon	Kenya	Swaziland
Congo, Dem. Rep.	Kyrgyz Republic	Tajikistan
Congo, Rep.	Madagascar	Tanzania
Cote d'Ivoire	Mali	Togo
Ecuador	Moldova	Tunisia
Egypt, Arab Rep.	Mongolia	Uganda
El Salvador	Morocco	Ukraine
Ethiopia	Mozambique	Uzbekistan
Georgia	Nepal	Vietnam
Ghana	Nicaragua	
Guatemala	Nigeria	

The data on total microfinance portfolio is collected from MixMarkets.com, where the microfinance banks, organizations and donors themselves provide the data. The implication of this is further discussed below under the limitations of the data. The data of the rest of the variables in the regression analysis is drawn from the World Bank database (worldbank.org 2011).

The time-period in the analysis is 1999-2008, due to the attempt to get a complete data set. There is not much data on microfinance to be found before 1999 and therefore this year is the starting point. The end-year is determined by the fact that the World Bank data for 2009 was not entirely filled in and the analysis is based on the data available. In conclusion this provides the data analysis with 52 countries over a 10 year period, i.e. 520 data observations.

6.2. DESCRIPTION OF THE VARIABLES

The dependent variable in the analysis is long run economic growth and the main explanatory variable of interest is microfinance investments measured as the entire portfolio holdings in the elected countries. Apart from these variables, some of the most commonly used macroeconomic factors in the endogenous growth literature are included. The eleven variables are assumed to be independent of each other and to either have a positive or negative impact on economic growth.

Economic Growth

The growth rate drawn from the World Bank is measured as the average annual growth rate in GDP. Following the mainstream growth literature, the GDP growth is then calculated into an average for each five year period in order to capture the long run growth (Levine 2004). This is also very suitable since the available data captures ten years which leads to a division of two five year periods.

Financial sector outreach: Microfinance

The Microfinance data is collected from the MIX (Microfinance Information eXchange), an online website providing financial performance data of MFIs. The data is voluntarily reported to the MIX database which has several implications, one being that the outreach and coverage of MFIs may be severely underestimated. The data used covers the 52 countries and includes the total loan portfolio holdings of every reported microfinance institution. Therefore there has been no division of donor dependent or self-functioning MFIs. The total loan portfolio of the country is the indicator of financial outreach (Ahlin et al 2010). Since the MFIs would indicate an expansion of the financial sector, the impact of the variable on economic growth is expected to be positive.

Logarithm of the per capita GDP

The theory of conditional convergence indicates a higher growth rate of lower-income countries then of the higher-income countries. The theory states that countries more distant from their own steady state are growing faster than the ones close to or above the steady state. A drop in fertility rates would lead to an increase in per capita growth although with a lagged effect (Barro 1991).
Seeing as GDP per capita is negatively correlated to growth, the logarithm of per capita GDP is included in the average five year growth regression, in order to check for this. The expected outcome of the variable is thus negative.

Investment: Gross capital formation per capita

In line with the theory stated above concerning conditional convergence, the other relevant factor to monitor is the gross capital formation per capita and this is therefore included. The variable is a measure of the rate of total investment related to GDP. In the simple endogenous growth model shown in section 3.2, the rate of investment does have a direct impact on the growth rate. By enhancing the total investments made, the long-run economic growth should be improved, thus the correlation is expected to have a positive outcome. The variable is also proven to be one of the most robust to be found in the growth literature (Hansson in Bourdet *et al.* 2007).

Financial sector development: Domestic credit to the financial sector

Seeing as the countries chosen probably will have a less developed financial sector, the normally used indicator of how developed the financial sector is, M2/GDP will not be an efficient measure in this regression. Instead *domestic credit to the financial sector* will be one indicator of how well developed the financial market is in the given country (Hansson in Bourdet *et al.* 2007). The variable represents the finance provided to the private sector through for example credit-loans or similar financial services and it is calculated as a percentage of the total GDP. This indicator is also used by Levine, Loayza, and Beck (2000 in Levine 2004) since the measure isolates the credit issued to the private sector and therefore is considered a strong predictor of financial sector development. The authors also verify the positive link between financial sector development and growth by using this variable, accordingly the outcome of the variable is expected to be positive in the regression.

Inflation

The rate of *Inflation* is also a variable used to measure the domestic economic policy and the macroeconomic stability of a country. A high inflation is an indicator of bad policy and bad management of the economy. The inflation variable is considered negatively correlated with growth and it is also shown that high inflation rates have, in general, a negative impact on banking activities (Boyd 2001 in Ahlin *et al*. 2010). The expected outcome of rate of inflation in the economic growth regression is thus negative.

Openness to trade

The openness to trade is an indicator of the economic policy carried out by the country. In the economic growth literature it is very common to construct a policy index with the indicators of good governmental policy, the inflation rate, government budget surplus and openness to trade. However the implications of using such an index are that the variables might be correlated with each other, thus invaliding the variables (Hansson in Bourdet *et al*. 2007). Therefore openness to trade will simply be measured as the export-import ratio related to GDP, e.g. the terms of trade. According to Levine and Renelt (2002), the main focus should be on the measurement of trade related to growth, since open countries tend to perform better. The outcome of the openness indicator is therefore anticipated to be positive.

FDI

Foreign Direct Investment, FDI is the total investments made in a country by a foreign owned company. The variable is claimed to be a small but significant source of growth in the low-income countries due to several factors. It is also an indicator of the friendliness of the investment environment (Todaro, Smith 2009 p.715). The data drawn from the World Bank measures the total inflow of FDI to a country and is expected to turn out positive.

Gross domestic savings

The level of investment is generally displayed by the gross capital formation per capita. However in the closed economy model the aggregated savings rate is transformed into the investment to output ratio, thus a higher savings rate leads to a higher growth rate. This variable is included to depict weather the investments being made are related to the domestic opportunities of a higher return on investment and therefore a domestic prospective growth rate (Barro 1991). The data set is collected from the World Bank indicators and is measured as a percentage of GDP.

Secondary education

The average number of years in secondary education is included as an indicator of human capital. Following Levine and Renelt (2002), among others, the variable is better associated with growth then illiteracy rates or primary schooling since many countries already have reached the upper bound for these measurements. The variable is measured as number of years in schooling from the age of 15 and above, thus excluding the primary years in school. The data is not screened for aspects concerning differences in gender, since it would be very difficult to obtain good quality data from every country in the analysis.

Strength of legal rights

Knack and Keefer (1995 in Barro 1997), discuss the attractiveness of investing a country by looking at how effective the legal environment is. The main concerns are how well contracts may be enforced and the fitness of the overall protection of property rights. In this study this will be modeled by the World Bank rating of how strong the legal rights are in each country.

Ranging from 1-6, where 1 indicates perfect protection of legal rights and 6 then indicates the opposite, very weak legal rights. In the regression analysis the variable is likely to have a positive outcome, since better legal environment is considered to encourage more effective investments thus increasing the overall productivity in the society.

Life expectancy at birth

The second indicator of human capital is more of a heath indicator. The data is a strong indicator of the wellbeing of the entire population since it refers to the expected mortality rates (Barro 1991). A common conception is that the poor health conditions in the low-income countries are a contributing factor of the poverty. Acemoglu *et al*. (2006), shows that a 1% increase in the life expectancy does have a very big impact on the population by raising it with circa 1, 5%. The basic line of thinking is, if the mortality rate is very high the average life expectancy at birth of course will be very low. This is in fact a particular acute problem in countries where the HIV-virus takes the lives of a large share of the young population each year. In the African countries south of Sahara the virus is carried by a vast share of the population, thus harming the development (unaids.org 2010).

7. ECONOMETRIC MODEL

The model used for the analysis is a multiple linear regression model. By using a multiple linear regression it is possible to examine how a dependent variable is affected by more than two independent variables (Westerlund 2005, p. 137-138). Apart from the dependent and the independent variable, the multiple regression analysis thus includes a set of independent control variables. This is done in order to "control" for a prospective influence the control variables might have on the correlation between the dependent and the independent variable we want to examine.

The model is outlined in the following manner:

$$GDP\ growth\ per\ capita_{it}$$

$$= \beta_0 + \beta_1 Financial\ dev._{it} + \beta_2\ FDI_{it} + \beta_3 GDP\ per\ capita\ log_{it}$$
$$+ \beta_4 Gross\ Capital\ Formation\ per\ capita$$
$$+ \beta_5 Gross\ Domestic\ Savings\ per\ capita_{it} + \beta_6 Inflation$$
$$+ \beta_7 Life\ expectansy_{it} + \beta_8 MFI + \beta_9 Openness$$
$$+ \beta_{10} Human\ capital + \beta_{11}\ Institutional\ variable + e_{it}$$

The GDP growth per capita is the dependent variable (y) and β_1-β_{11} are the independent variables used to examine the GDP growth. β is a constant that indicates the slope and intercept and finally e is a stochastic term that explains small differences between the expected value of the dependent variable and the independent variables.

Data from the 52 countries over 10 years is analyzed in the regression, which is done by using the program Mat Lab and the Ordinary Least Squares (OLS) method.

The regression produces different values with which an analysis can be made. The analysis will tell us if the different independent variables affects the dependent one and in which way.

Three values are of particular importance, the P-value, coefficient and the adjusted R-squared value. The p-value shows if the variable is significant, that is if the variable could be used in the analysis of the data or not. The value is somewhere between 0 and 1 (100 %) and common used significant levels are 1, 5 or 10 %. If the value is under 0.01 and the preferred level is 1 % than the value is significant and could be used to interpret the dependent variable (Westerlund 2005, p. 124).

The second value is the coefficient value which shows how much the independent variable affects the dependent and also in which way. A positive number means that there is an increasing effect on the y factor and a negative number means that there is a decreasing effect.

Finally the third term, adjusted R-squared value, shows how much of the y factor that is explained by the variables included in the model. For instance 50 % means that half of the dependent variables value is explained by the independent ones (ibid.).

7.1. LIMITATIONS OF THE METHOD

There are several methodological issues worth mentioning since it might bias the result. First of all, the OLS-model requires that the variables are uncorrelated with each other. If there are variables in the regression analysis that are correlated this will cause the estimates to be biased or inconsistent. The two stages least squares model are considered to be more appropriate when dealing with the possibility of a two-way causality. King and Levine (1993) use three stages least squares regression in order to restrict the causality issue. However both of these methods are beyond the scope of this thesis, since they require more advanced knowledge which is provided at higher levels of education.
Nonetheless, when measured, the difference between the OLS-model and the two stage least squares model has not been very big, indicating that the possible bias would then be of a small character (Hansson 2007 in Bourdet *et al.* 2007).

7.2. DESCRIPTIVE STATISTICS

The regression contains the following 12 variables of which GDP Growth is the dependent variable and the rest is the independent variables. The expected outcome of these variables is modeled in box 3 found below.

Box 3: Expected outcome of the regression

Variable:	Measured as:	Expected outcome:
Long-run GDP per capita growth	The annual average of GDP growth per every five year period in US dollars.	Dependent variable
Financial sector development	Domestic credit to private sector as a percentage of GDP in US dollars.	-
FDI	The annual net inflow of FDI in US dollars	+
GDP per capita Log	Logarithm of GDP per capita in US dollars	-
Investment measure 1	Gross Capital Formation per capita in US dollars	+
Investment measure 2	Gross Domestic Savings measured in US dollars as a percentage of GDP	+
Inflation	The deflated rate of inflation	-
Life expectancy at birth	The average life expectancy at birth (in years)	+
Financial sector measure 2: Outreach (MFI)	MFI total portfolio holdings (per country)	+
Openness	The openness measured as the total (exports-imports/GDP)	+
Human capital	Years in secondary education from the age of 15 and onwards	+
Institutional variable	Strength of legal rights. World Bank rating	+

7.3. ESTIMATION AND RESULTS

Variable	Coefficient value	P-value
Financial dev.: Domestic credit to private sector	-0.0341	0.0000*
FDI	2.59414e-010	0.0000*
GDP per capita Log	-0.3322	0.0045*
Investments: Gross Capital Formation per capita	3.84839e-009	0.0569
Investments: Gross Domestic Savings	-0.0060	0.5780
Inflation	-0.0068	0.2524
Life expectancy at birth	0.1171	0.0000*
MFI	4.47497e-010	0.2341
Openness	7.37528e-005	0.0000*
Human capital: Years in secondary schooling	-0.0328	0.8293
Institutional variable: Legal rights strength	0.2531	0.0000*
R-squared	0.251068	
Adjusted R-squared	0.24044	
* = Significance at 1 % level	**=Significance at 5 % level	

7.4. ANALYSIS OF THE RESULTS

The regression presented in the box above shows that six of the explanatory variables are significant at the 1% level. The six significant variables are; *financial development*: domestic credit to private sector, *FDI*, logarithm of *GDP per capita*, *Life expectancy at birth*, *openness* and *institutions* in the form of the strength of legal rights.

Altogether, the adjusted R-squared is approximately 24%, meaning that the eleven variables in the regression analysis only account for 24% of the change in long-run economic growth, the dependent variable. According to Westerlund (p.133) the higher explanatory value, the better is the regression and 100% is the highest value. Interpreting this indicates that 24% is not a very good figure because 76% of the explanatory factors of economic growth are found outside of this analysis. However, the possible reasons to the low value will be discussed further on in the analysis.

Nonetheless, there were significant variables with a predicted outcome that matched the real outcome. Of the insignificant variables only one variable had an unexpected outcome and that was the investment rate measured as the share of gross domestic savings in the total GDP. The expected outcome was for it to be positive but it turned out to be of a negative character. Seeing that the variable was insignificant there is only room for some speculations about the outcome.

The negative result and the insignificance of *gross domestic savings* as a share of the GDP was not expected, however the result is neither surprising. In low-income countries the rate of savings may be very low due to limitations of savings intermediations such as bank deposits, etc. Another possible explanation is that the savings are not invested but instead consumed. This will lead to savings not promoting growth. It might also have a negative impact on growth given that the major part of the savings is being consumed instead of invested.

The expected outcome of the *inflation* rate was negative, which also the outcome in the regression analysis is. However, most studies on economic growth find the rate of inflation to be a significant variable. King and Levine (1993) find inflation to be significant at a 5%-level and Hansson (2007 in Bourdet et al) find it significant at the 10% level. This is not the case here. In the regression analysis conducted the rate of inflation is far from being significant even if the constraint were to be relaxed to the 10% level. One explanation of this result is that the inflation data used from the World Bank was not calculated into five year averages. This may have misled the connection normally found between the rate of inflation and economic growth. Generally inflation is considered a good indicator of the macro-economic stability of a country and the overall soundness of the economic policy conducted by the government.

The chosen human capital indicator, number of *years in secondary education*, was indeed positive as expected but not significant at all in the regression. The variable is a tricky one, though it is widely considered that education is a basic but good indicator of human capital, it is not always significant in the regression analysis. One conclusion offered is that human capital is a much broader concept and that the length of secondary education cannot capture that entirely. Another conclusion provided suggests that the time lag between receiving schooling and producing something valuable in growth terms, leads to a mismatch when trying to prove the human capital contribution to growth.

Gross capital formation per capita, measuring the ration of investment to GDP, with the figure 0.0569 is neither significant at the 1% nor at the 5% level. However by relaxing the level of constraint to 10%, the variable fits well within the testing level and is thereby significant. The variable was expected to have a positive impact on growth and this was also the case in the regression above. This supports the endogenous theory of achieving growth described in section 3.2.

SIGNIFICANT VARIABLES

Of the significant variables, financial sector development measured as *domestic credit to private sector* verified the assumption of financial sector development having a positive impact on long-run economic growth. The finding is also in line with the empirical study of Levine, Loayza, and Beck (2000, in Levine 2004). The variable is intended to calculate the distribution of domestic assets, in which the private sector is highlighted. In developing countries there might be some problems with competition or corruption concerning the government owned enterprises. The government might only channel credit to government or state owned enterprises, thus undermining the financial sector components. The government may not be evaluating managers, pooling risk, selecting the most prospective investment project or having the pressure to deliver financial services at the same rate as the financial sector does to the private sector. Consequently, in this regression the argument of financial development promoting growth holds.

Foreign direct investment, *FDI*, turned out to be both significant at the 1% level and positive. Since the beginning of the 1990s the rate of foreign direct investment has increased from 35 billion dollars to an incredible number of 334 billion dollars in 2005. The inflow of investment in low-income countries is still considered to be low in relation to the high income countries, since Africa's share of FDI only was 3% (Todaro, Smith 2009 p.715). There is however a growing conviction that FDI is growth enhancing in several ways. To mention a few, FDI is considered to have both technological and knowledge increasing effects where the human capital rate is raised and the technology improved. It is therefore regarded as a variable having positive impact on long-run growth.

The expected negative outcome was confirmed in the actual outcome of the *logarithm of GDP per capita.* The variable was also significant at the 1% level in the above regression and thus establishes the earlier presented theory of conditional convergence. That is, countries positioned below their steady state display a faster growth rate. The variable is considered to be one of the most robust ones with a strong level of significance, which also is the case in this regression.

Another variable that is expected to be significant is the human capital indicator measured as *Life expectancy at birth.* The outcome of the variable was expected to have a positive impact on growth. In the regression both of the expectations was confirmed at the 1% level. Life expectancy at birth does have an impact on economic growth. The battle against health issues in the developing countries are a serious issue and it is at large considered that poor health hurts the growth rate. If the countries with an extremely low life expectancy were able to keep a larger share of the population alive, according to the regression the growth rate would then increase. However there are some doubts to this conclusion. Acemoglu *et al.* (2003) is one to claim that it takes more to solve poverty then solely upgrading the health of the population.

The terms of trade indicator of the *openness* of a country is both significant ant the 1% level and positive as predicted. Thus the regression indicates that an enhancement or improvement in the terms of trade would spur the economic growth rate. However Barro (1991) argues that

even though the variable is strongly significant in the regression analyses, openness is not one of the central factors in determining the poor performance of growth in the developing countries. Given the fact that the total explanatory value of the regression conducted in this thesis is rather low, the openness variable could not be one of the most important ones in usurping growth.

The *Institutional variable; Strength of legal rights,* in the regression analysis above is both significant and positive. The outcome reflects the fact that the strength of the legal rights in a developing country has an impact on the rate of economic growth. The better the legal rights are the more positive is the impact on the growth rate.

The quality of the legal rights in a country has been emphasized as an important factor by several authors. As mentioned earlier, de Soto (2000 in Armendáriz, Morduch 2010 p.58-59) claimed it to be one of the most important variables in overcoming market imperfections. It is very logical to assume that insecure property rights may cause hindrances such as preventing access to finance. Moreover Claessens and Laeven (2003 in Levine 2004) show that poor property rights may distort investments thus leading to a suboptimal allocation of resources since the firms are pushed towards investing too much in solid assets. Subsequently, the growth rate is lessened by poor property rights.

The main variable of interest, *MFI*, the microfinance variable was chosen to measure financial sector development in terms of outreach in the low-income countries. The expected outcome of the variable and the theory of it suggested a positive outcome and a potential significance. The outcome in the regression is undeniably positive, but the significance was left out. This was rather discouraging but not surprising. As suggested by Ahlin et al., the microfinance sector is probably too small to have any real impact on economic growth. The less pessimistic explanation to the lack of result could be that the variable was treated in the wrong manner. Summarizing the total portfolio holdings by MFIs in a country is perhaps not the best estimate of the expansion of the average household and firm assets. In order to compare the MFI variable to the average growth rate per capita, the MFI should perhaps have been divided by the total population or seen as a percentage of the increase in the liquid assets to GDP. To bear in mind is also the fact that the data collected from the Mix market online platform is self-reported by the MFI's and the coverage is therefore rather limited. This assumes an underestimation of the real operations and in measuring the outreach.

8. CONCLUDING REMARKS

The goal with the thesis was to investigate if there is any impact of microfinance on long-run economic growth. A multiple regression analysis was conducted with the two variables to be tested alongside with a set of variables more or less known to have an impact on growth rates. The outcome of the regression did not show any significance of MFI on growth and is therefore insufficient in providing any conclusions. The summary of the thesis question and answer further below in this section will thus only contain speculations concerning the non-significant MFI variable.

The regression supported some of the control variables and it presumed negative or positive outcome. Even though financial development only was measured by the domestic credit to private sector variable, it came out significant in the regression. This is a somewhat verification of the previous findings by Levine, Loayza, and Beck (in Levine 2004). Moreover, it means that the second assumption of this thesis holds; financial development depicted by this variable does promote economic growth. However the share of impact is not assessed and for that reason it is impossible to say anything about the magnitude of the effect that financial development has on growth, only that there is a clear positive effect.

Additionally, of the control variables included, GDP per capita, Life expectancy at birth, Openness, Strength of Legal rights rating and FDI were all significant and verified the pre expected negative or positive impact on growth. By relaxing the restriction of the test level, the variable for measuring the rate of investment in the economy (Gross capital formation per capita) also became significant. Some support for the theory of conditional convergence was found, which also is generally expected when including the initial income of developing countries in an economic growth regression (Hansson in Bourdet et al).

The only real surprise was the non-significant outcome of the rate of inflation. Nevertheless, it was negative as expected since high inflation is a big part of the macroeconomic instability in many developing countries. The reasons for the failed may be of calculation character. On the other hand not every study conducted finds significance below the 10% rate.

Lastly, the MFI variable testing the financial outreach in the low-income countries did not show any significance in the regression. The number of possible explanations to this failure are vast and some of them are more realistic then the others. One explanation already presented in the analysis of the results above, could be that this way of measuring MFI and access to financial services is not well suited. Perhaps another indicator of MFI performance could do better in a growth regression. It may also be the case that the fraction of MFI is too small and thus cannot affect growth nor act as an enhancement to growth. The MFI has been argued by many to be a niche market, unable to have a large effect on the country. The microfinance institutions are focused on serving the poor which also could be a possible explanation to why it has no effect on growth. The poor living in countries with poor financial development may gain very little growth from the marginal increase in financial development. This view is supported by Rioja and Valev (2004b in Levine 2004) who argue that the impact of financial development on growth is non-linear thus having a lesser effect in low-income

countries. The conclusion is then that an improvement in the access to finance through MFI has a very small effect on the growth enhancing mechanisms.

The more optimistic viewpoint could be that it is too early to see any impact of MFI on economic growth. The time lag discussed in section 8.3 concerning education as a measurement of human capital could also be the hindrance in this case. The MFI variable may not be visible today but could be it tomorrow or the day after that. This could relate to the famous quote of Solow: "You can see computers everywhere but in the productivity statistics". (Solow 1987). Seeing that the MFI's has expanded in the recent decade, the data on the MFI will probably be better in a few years' time. Hence, even though this thesis did not show any significance of MFI in promoting economic growth it might not be the case that the economic growth rate is unaffected.

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10. LIST OF ABBREVIATIONS

FDI = Foreign Direct Investment

GDP = Gross Domestic Product

MFI = Microfinance Institutions

MFS = Minor Field Study

NGO = Non-governmental Organizations

OLS = Ordinary Least Squares

11. APPENDIX

THE RESULT OF THE MULTIPEL REGRESSION :

Coefficients with Error Bars

	Coeff.	t-stat	p-val
X1	-0.0340633	-4.2614	0.0000
X2	2.59414e-010	4.5965	0.0000
X3	-0.332234	-2.8549	0.0045
X4	3.84839e-009	1.9093	0.0569
X5	-0.00601239	-0.5567	0.5780
X6	-0.00677117	-1.1462	0.2524
X7	0.117077	7.5055	0.0000
X8	4.47497e-010	1.1916	0.2341
X9	7.37528e-005	4.5872	0.0000
X10	-0.032777	-0.2157	0.8293
X11	0.253139	4.5774	0.0000

Next step:
Move no terms

Next Step

All Steps

Export ...

Intercept = 6.66916   R-square = 0.251088   F = 23.5807

RMSE = 2.39625   Adj R-sq = 0.24044   p = 4.68216e-024

Model History