THE IMPACT OF MICRO-FINANCE ON LONG-RUN ECONOMIC GROWTH

BY

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Declaration

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Abstract

Micro-finance, banking and financial services to the poor, is a highly debated global phenomenon introduced by Nobel Prize Winner Dr Mohammad Yunus of Bangladesh in the 1970s. Dr Yunus has proven that the poor are in fact sufficiently responsible to manage credit and repay loans on time. The aims of micro-finance are to improve the borrowers' standard of living, education, nutrition, health and so forth.

According to the United Nations, 2005 was the International Year of Micro-finance. Since then, micro-finance has been shown to be an efficient and compelling economic tool for the poor sector of an economy where access to formal financial services is restricted. It demonstrates that access to efficient provision of micro-finance can empower the poor to smooth their consumption, better manage their risks, build up their own assets, develop their small and medium-sized enterprises, increase their income earning capacity, and improve their standard of living.

This study investigates the relationship between Real Per Capita growth rate and standard growth determinants, conventional finance and micro-finance determinants in a sample of 124 countries over the period 1995-2013. The data on growth and conventional finance variables were collected from the World Bank Indicators, Barro-Lee database, Beck & Demirgüç-Kunt database and International Financial Statistics database, and the micro-finance data were collected from the Micro-finance Exchange (MIX) market. The basic estimation technique, Ordinary Least Square (OLS) is applied; this study uses the initial values of variables as well as the averages of the variables. This study provides empirical evidence as to the impact of conventional finance and micro-finance determinants on economic growth. The results suggest that conventional finance indicators, i.e. liquid

liabilities to GDP and domestic credit provided by the financial sector, and micro-finance

variables, i.e. gross loan portfolio and active borrowers, have impacts on economic growth.

CHAPER 1: INTRODUCTION

1.1 Background

Micro-finance is a banking system for those who are unable to approach conventional, formal banks. It brings credits, savings and other necessary financial services to poor people who are not able to obtain financial services from formal banks due to insufficient collateral (Van Maanen, 2004). Seibel (2003) states that micro-finance is the provision of financial services to the poorer section of the population; it has a long history and is considered an important sector in current development. Micro-finance has positive impacts on the lives of poor people by providing them with access to the financial services.

Over the last two decades, a large number of informal organisations such as non-governmental, governmental, and private sector organisations have been established for the purpose of meeting the needs of poor people who are excluded from the formal financial system. Micro-finance uses both formal and informal arrangements in offering financial services to such people (James & Gary, 2004). According to Hardy et al. (2002), micro-finance institutions (MFIs) vary throughout the world, being more developed in certain countries and regions than in others.

According to Morduch (2003), the availability of the financial services to poor people in developing countries is usually restricted in terms of cost, risk and convenience. Micro-finance institutions therefore play a vital role in the banking system by extending credit to borrowers whose access to formal banks would be too costly or too risky. Lacking collateral and living far away from banks, poor households often approach informal moneylenders when in urgent need of credit. Repayment to these moneylenders at high, indeed, often exorbitant, interest rates affect the financial situations of many families. Micro-finance institutions have developed a strong track record over the last three decades in alleviating

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poverty and advancing the economic needs of low-income households. Micro-finance programs have been found to increase and diversify household income, promote household savings, and enable people to bring consumption smoothing to their income volatility. Various studies have also found that micro-finance clients have better educational and health outcomes. It has been observed that micro-finance can also support women to empower their households in a society (Khandker, 2003).

Donou-Adonsou and Sylwester (2015) state that the main goal of micro-finance is to provide financial services to the poorest sector of an economy. The micro-finance industry has extremely extended its intermediation activities considerably since the start of the 21st century, specifically in developing countries. The total assets of the micro-finance sector have increased by more than 2,000% since the end of the 1990s. Despite growth in the micro-finance sector, scholars and researchers have been giving considerable attention to micro-finance at micro-level and have found that it has a positive effect on consumption, savings, agriculture, investment, income per capita, employment, health, education, and housing. These micro level studies include Khandker (2005), Imai and Azam (2011), Berhane and Gardebroek (2011), and Kaboski and Townsend (2012). While a few recent theoretical studies have been conducted on the macro impact of micro-finance, no appropriate study to empirically analyse the effects of micro-finance on macro-economic indicators has been conducted to date. The present study investigates the impact of micro-finance on economic growth across countries, which to the best of the researcher's knowledge, have not yet been explored. This study considers economic growth as an important macroeconomic indicator using a panel data of 124 countries in the long run.

Hence, the objective of this study is to investigate the impact of micro-finance on long-run economic growth.

1.2 Hypothesis of the study

H0: There is no correlation between micro-finance and long-run economic growth (gi)

H1: There is a correlation between micro-finance and long-run economic growth (gi)

1.3 Micro-finance: An introduction

Micro-finance has been termed "one of the most compelling innovations in development policy of the past twenty-five years" (Ahlin and Jiang, 2008, pp.1-2). The aim of this development is to expand small amounts of capital to poor borrowers all over the world, generally to facilitate income-generating self-employment activities. In addition, other aspects of micro-finance have also received attention, including its use of subsequent loans and local flows of information (Ahlin & Jiang, 2008). According to Meenakshi and Brida (2003), micro-finance is the provision of financial services to micro-entrepreneurs and small scale businesses, which have no or little access to formal banking related services due to the high transaction costs associated with serving these client categories.

Micro-finance has existed, although mostly in the shadows and unseen by casual observers, since the rise of formal financial systems, and indeed probably predates them. The micro-finance phenomenon came to the fore in the early 20th century in Germany during the great depression of 1929 and later spread to the Europe and Asia (Steinward, 2001). However, it has only been within the last four decades, that serious global efforts have been made to formalise financial services provision to the poor. This process began in earnest around the early to mid-1980s and has since gathered impressive momentum. By 1995, there were already thousands of MFIs providing financial services to an estimated 100-200 million of the world's poor people (Christen et al., 1995). The rise of the micro-finance industry represents a remarkable accomplishment taken within the historical context. It has overturned

established ideas of the poor as consumers of financial services, eradicated stereotypes of the poor as not bankable, engendered spawned a variety of lending methodologies demonstrating that it is possible to provide cost-effective financial services to the poor, and mobilised huge sums of social investment for the poor (Mutua et al., 1996).

The total loan portfolios of MFIs in mid-2006 were about US$17 billion, with the potential to increase to US$250-300 billion in the future (Ehrbeck, 2006). According to Callaghan et al. (2007), the estimated annual growth rates of MFIs range from 15% to 30%, consequently suggesting that demand for additional portfolio capital in each year will be between $2.5 billion and $5 billion, with US$300 million to US$400 million in additional equity required to support such lending. A 2004 CGAP survey was conducted on 144 MFIs and indicated that insufficient donor funding has been the main factor in limiting growth (CGAP, 2004).

Table 1: Regional Distribution of Gross Loan Portfolio & Active Borrowers

Region	Gross Loan Portfolio (US $ billion)	Active borrowers (million)
Africa	8.5	5.3
East Asia and the Pacific	13	15.1
Eastern Europe and Central Asia	10.4	3.4
Latin America and The Caribbean	40.5	21.6
Middle East and North Africa	1.2	2.1
South Asia	13.8	58
Total	87.4	105.5

Source: MIX (2016)

As Table 1 shows, Latin America and the Caribbean and South Asia regions have the highest gross loan portfolio and the largest number of active borrowers, followed by East Asia and Pacific and Eastern Europe and Central Asia. This is also evident from Figures 1 and 2, which show the distribution of gross loan portfolio and number of active borrowers across various regions. As Figure 1 shows, approximately 46% of gross loan portfolios are in Latin America and the Caribbean, and 69% of active borrowers are in South Asia. The second largest percentage of gross loan portfolio (16%) in the South Asia and active borrowers (14%) in Latin America and the Caribbean, followed by East Asia and Pacific, Africa and Eastern Europe and Central Asia.

Figure 1: Distribution of Gross Loan Portfolios by Region
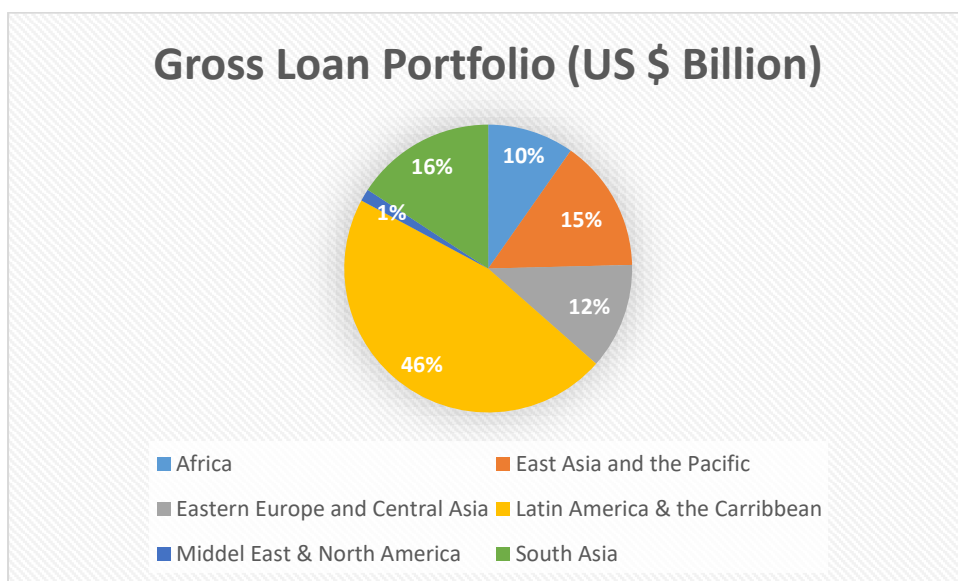
Figure 2: Distribution of Active Borrowers by Region

Active Borrowers (in millions)

- Africa — 4%
- East Asia and the Pacific — 10%
- Eastern Europe and Central Asia — 2%
- Latin America & the Carribbean — 14%
- Middel East & North America — 1%
- South Asia — 69%
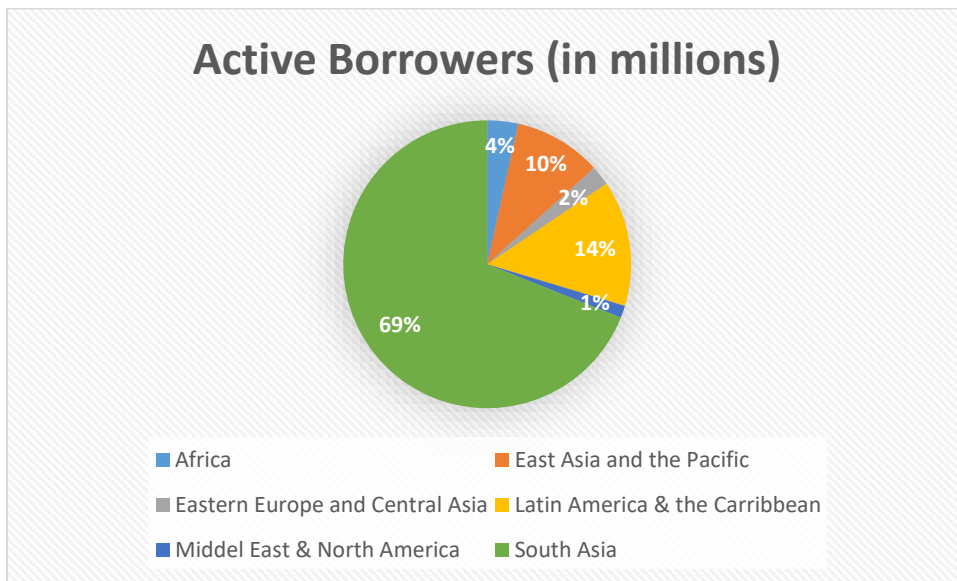
1.4 Importance and motivation of the study

Micro-finance is widely recognised as a special type of financial service for those people who are underprivileged, unemployed, underemployed, or self-employed and unable to pledge the collateral often required by the traditional banking system and who therefore do not have access to commercial banks (Grameen Bank, 2010). Do micro-finance services/products have impact on long-run economic growth in developing countries? This is one of the important questions in the debate on the impact of micro-finance with respect to increasing long-run economic growth. One important channel through which economic growth can be improved is by reducing poverty. Sala-i-Martin (2003a) divides the world into regions and notes that poverty eradication has been most pronounced in the regions where growth has been highest. Various empirical approaches have been used to explore the relationship between finance and growth. Numerous empirical studies have attempted to study the impact of micro-finance on the well-being of poor people, using sample survey data at village level and using micro-level approaches; however, the results have remained inconclusive.

Micro-finance is often perceived as different from conventional finance. By scrutinising the most recent trends of this rapidly evolving industry. Micro-finance is evolving rapidly, in particular from a focus on group lending technologies to a much broader emphasis on providing a range of financial products required by different categories of poor people. In countries where micro-finance has a sufficiently long history and has reached a certain level of industrialisation, it can be expected that it will shape the path of micro-finance to growth (Sultan & Masih, 2016).

Empirical evidence on the impact of micro-finance on economic and social factors is mixed. Researchers have used a variety of micro level methods such as randomised instrumental variable and village fixed effects method, pipeline and non-borrowers as control group, panel data methods, randomised evaluation method, propensity matching method, double difference method, instrumental variable method and pipeline method (Khan & Wright, 2015). The results so far show that there is no clear evidence of the impact of micro-finance on any of the outcomes. In addition, there are some studies which find no impact of micro-finance (Morduch, 2001; Banerjee et al. 2009).

Self-selection bias is considered a potential problem in the micro-finance program as well as in impact evaluation studies (Colman, 1999). In order to control for self-selection bias, researchers have been applied the randomised control trail method; however, this method has some shortcomings. Mostly studies on the impact of micro-finance use micro data, carrying out randomised control trials and quasi-experimental estimation techniques to control the problems (Banerjee et al. 2009; Karlan and Zinman 2009; Khan & Wright, 2015; Khandker, 1998). To evaluate the impact assessment and to obtain conclusive empirical results, we applied a macro approach because the results from the micro approaches do not give a clear answer about the impact of micro-finance. In this macro approach, a basic long-

run economic growth model is built with the growth determinants, then this model is augmented with conventional finance and micro-finance variables.

1.5 Scope and limitations

The formal financial sector plays a vital role in the economic growth of developed and developing countries. It is considered to be the backbone of economies. The evolution and the introduction of micro-finance have meant that there is another addition to the financial sector. Both the formal and informal financial sectors (micro-finance) have been assisting in the promotion of economic growth in the developing countries. However, in this study the central point will be the role of the financial sector and micro-finance on economic growth in 124 countries in the long run. The data are divided into five regions.

The dataset contains a pool of observation for 19 periods. However, the information is gathered from the Micro-finance Exchange (MIX), where the data are submitted by institutions voluntarily. This could raise a concern of sample selection bias. The bias may occur from different firms' participation in the sample as well as differences in participation from year to year. However, the forms are chosen in such a way as to eliminate selection bias. Missing data in micro-finance variables is one of the main limitations of this study.

Although the dataset contains a large number of observations, one problematic characteristic is that the information was submitted voluntarily by institutions, rather than gathered systematically from a diverse set of micro-finance institutions. MIX data are self-reported and are known to have a bias towards larger and more commercially oriented MFIs. It would be interesting to see whether the results hold when using different databases. Secondly, there were few variables at our disposal for measuring formal financial sector development. It would be interesting to analyse the impact of using additional and perhaps more detailed measures for financial sector development.

1.6 Overview of the dissertation

Chapter 1 presents the background and an introduction to micro-finance. It describes the importance and motivation of the study and its hypothesis. It also explains the scope and limitations of the study. Finally, this chapter examines the global outreach of micro-finance in terms of gross loan portfolio and number of active borrowers across the world.

Chapter 2 presents the literature review of the study. It includes some technical aspects of growth theory in the light of Solow and Romer approaches, the literature on the determinants of long-run economic growth, the role of financial sector in economic growth, and role of micro-finance in economic growth. It also argues that firm-level studies, industry-level studies, individual country-studies, and a broad cross country comparison, prove a strong positive relationship between the functioning of the financial sector and long-run economic growth. Furthermore, it also explains the importance of a well-developed financial sector in the promotion of economic growth and the usefulness of the McKinnon – Shaw hypothesis on financial repression. Finally, this chapter also highlights the various purposes of micro-finance, such as enterprise financing, asset accumulation, consumption smoothing, improving quality of life, improving education and health sector etc. It acknowledges the reality that the micro-finance makes a contribution to GDP by increasing the income level of the borrowers but also through its indirect effects on the other sectors of the economy. Micro-finance has direct effects, increasing productivity in different sectors of the economy where micro-finance is used for productive aims.

Chapter 3 presents the research methodology of this study and summary statistics of the data collected and the estimation method. To estimate the impact of micro-finance on long-run economic growth as well as the impacts of basic growth and financial sector determinants on long-run economic growth, data were collected from the World Bank Indicators,

International Financial Statistics database, Penn World Table, Barro-Lee database and OECD table.

The data of conventional finance variables were collected from World Bank Indicators, the Beck & Demorguc-Kunt database and the International Financial Statistical Database, Micro-finance data were collected from the Micro-finance Exchange (MIX) market, CGAP and Bank Scope databases. The chapter also presents the regression model, and the descriptions of all data variables of the study.

In Chapter 4, the growth model, the impact of basic growth determinants, conventional finance/ financial sector indicators and the impact of micro-finance indicators on long-run economic growth are discussed. The results indicate that basic growth, financial sector and micro-finance indicators do have a significant impact on long-run economic growth. This chapter also discusses initial variables of the models as well as regional dummy variables.

The conclusion of the study is presented in Chapter 5. This chapter presents a summary of the main points of the findings from the model. In addition, this chapter also explains the policy implications of the study and makes some useful suggestions for future research.

The impact of Micro-Finance on Long-run Economic Growth

Chapter 2: Review of the Economic Growth Literature

This chapter offers a review of the literature on the determinants of long-run economic growth, the role of the formal financial sector and micro-finance sector in economic growth, as well as empirical evidence for the existence of the impact of growth determinants, the formal financial sector, and micro-finance on economic growth. It includes the researcher's own opinions and arguments of the existing work.

2.1 A Brief History of Modern Growth Theory

Classical economists, such as Adam Smith (1776), David Ricardo (1817), and Thomas Malthus (1798), and, much later, Frank Ramsey (1928), Allyn Young (1928), Frank Knight (1944), and Joseph Schumpeter (1934), predicted many of the fundamental elements in their own time that have emerged in modern theories of economic growth. These studies cover the intrinsic approaches of competitive behaviour and equilibrium dynamics, the role of diminishing returns and its relation to the agglomeration of physical and human capital, the relationship between per capita income and population growth rate, the effects of technological progress in the forms of increased specialisation of labour and the introduction of new goods and production methods (Barro & Sala, 2003).

Ramsey's (1928) intertemporal discrete utility function is as widely used today as the Cobb-Douglas production function. Economists did not, however, accept and utilise Ramsey's approach until the 1960s. Between Ramsey and the late 1950s, Harrod (1939) and Domar (1946) tried to integrate Keynesian analysis and essentials of economic growth. They put different inputs as substitutes in the production function and argued that the capitalist system was intrinsically unstable.

The next and more important contributions came from Solow (1956) and Swan (1956) regarding the production function. The main features of the Solow-Swan model are the neoclassical form of the production function, a condition that assumes constant return to scale, diminishing returns to each input, and some positive elasticity of substitution between the inputs. This production function is combined with a constant-saving-rate rule to generate a simple general-equilibrium model of the economy.

The work of Cass (1965) and Koopmans (1965) completed the basic neoclassical growth model. They brought Ramsey's analysis of consumer optimisation back into the neoclassical growth model and thereby provided for an endogenous determination of saving rate. This addition allows for transitional dynamics but tends to reserve the hypothesis of conditional convergence. The endogeneity of saving does not abolish the dependence of the long-run per capita growth rate on exogenous technological progress. However, after Cass (1965) and Koopmans (1965), growth theory became excessively technical and steadily lost contact with empirical applications.

After the mid-1980s, research on economic growth began to receive greater attention, beginning with the work of Romer (1986) and Lucas (1988). The motivation for this research was the observation that the determinants of long-run economic growth are important issues, as well as being more important than the mechanics of business cycles effects of monetary and fiscal policies. The significance of long-run growth was a first step to escape the limitation of the neoclassical growth model, in which the long-term per capita growth rate was fixed by the rate of exogenous technological progress. Thus, as a result, more recent contributions determine the long-run growth rate within endogenous growth models.

2.2   Technical Aspects of Growth Theory

In this part of the study, some of the technical aspects of growth theory, especially of Solow and Romer, including the basic diagrams and equations of each approach in the light of Cobb-Douglas model will be discussed.

2.2.1   Solow and Romer Growth model

In 1956, Robert Solow published an influential paper on economic growth and development. Its title was "A Contribution to the Theory of Economic Growth". It was an outstanding work on economic growth which advanced the understanding of the field. For this phenomenal piece of work, Solow was awarded the Nobel Prize for Economics in 1987 (Jones, chapter 2, 1998).

2.2.2   The Basic Solow Model

The basic Solow model consists of two equations, a production function and a capital accumulation equation. The production function describes how inputs, i.e. labour and capital, combine to produce output. In the model, capital is denoted by K, Labour, L and output as Y. The Solow production function is assumed to have a Cobb-Douglas form and it is given by

$$Y = F(K, L) = K^\alpha + Le^{1-\alpha}$$ --2.2.2a

Where α is certain numbers ranging between 0 and 1. This production function shows constant returns to scale: if the inputs (K, L) are doubled, output (Y) will also be doubled (Jones, 1998).

$$Y = K^\alpha$$ --*2.2.2b*

In this production function, with more capital per worker, firms produce more output per worker.

Figure 2.1 A Cobb-Douglas Production Function
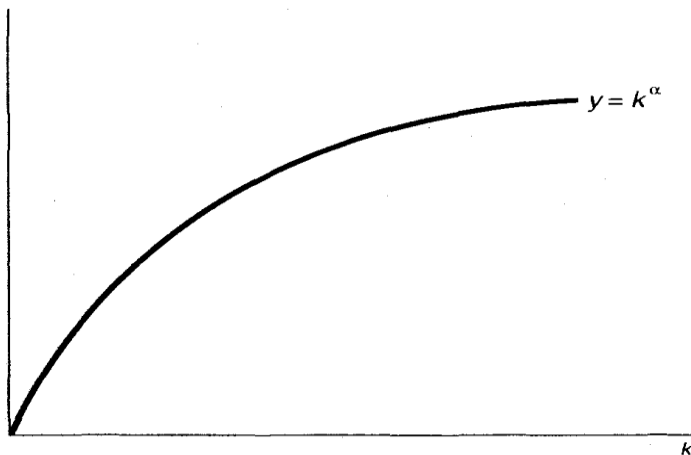
The production function is graphed in figure 2.1. It shows that when there is more capital per worker, firms produce more output per worker. However, there are diminishing returns to capital per worker. In addition, each extra/additional unit of capital to a single worker increases the output of that work by a low rate (Jones, 1998).

2.2.2.1 Capital Accumulation Equation

$k = sY\text{-} dK$ --*2.2.2.1*

This equation of the Solow model describes how capital accumulates. According to this equation, when there is a change in capital stock, k, is equal to the amount of gross investment, sY, less the amount of depreciation that occurs during the production process, dK.

2.2.2.2 Capital Accumulation per worker

$k = sy \text{-} (n + d) k$ ---*2.2.2.2*

The equation states that the change in capital per worker in each period is determined by three terms. Two of the terms are related to the original capital accumulation equation. Investment per worker, sy increases k, while on the other hand, depreciation per worker, dk, reduces k. If there is no investment and no depreciation, capital per worker would decline and is the same nk by setting k to zero (Jones, 1998).

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2.3 The Solow Diagrams

Figure 2.2 The Basic Solow Diagram
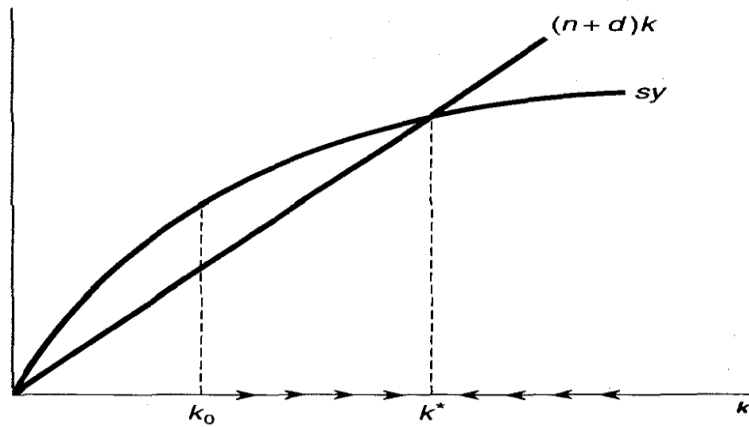
Figure 2.2 displays the basic Solow diagram. It consists of two curves, framed as functions of the capital-labor ratio, k. The diagram shows the two curves, where the first curve indicates the amount of investment per person, sy and the second curve is the line (n + d) k which represents the amount of additional investment per person required to keep the amount of capital per worker constant; both depreciation and the rising workforce tend to reduce the amount of capital per person in the economy. Capital deepening occurs when the change between two curves is positive and capital widening occurs when the change per worker is zero (Jones, 1998).

Figure 2.3 The Solow diagram and Production Function

Figure 2.3 shows the Solow diagram and the production function. The Solow diagram determines the steady-state value of capital per worker. The production function then determines the steady-state value of output per worker, y* as a function of k*.
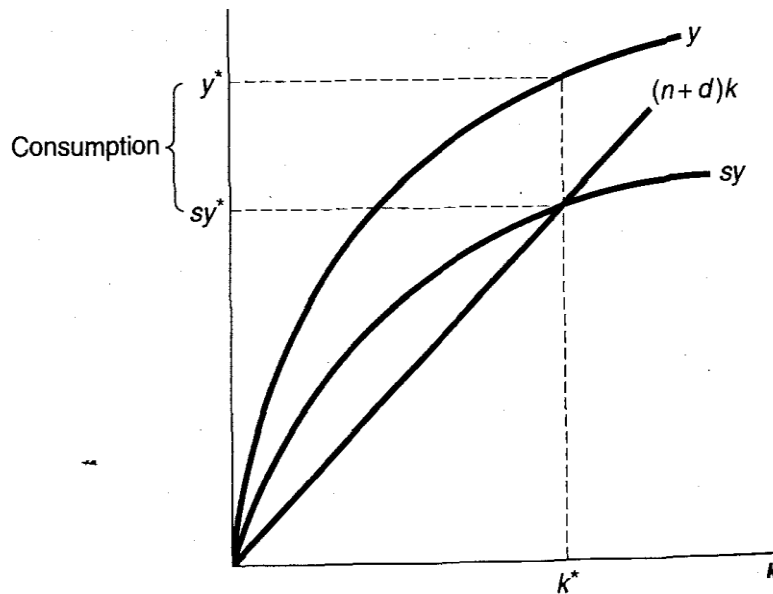
Figure 2.3 shows the Solow diagram and the production function. The Solow diagram determines the steady-state value of capital per worker. The production function then determines the steady-state value of output per worker, y* as a function of k* (Jones, 1998).

2.4 A Solow Model of Long-run Economic Growth

Y = F (L, K) --- 2.4

In the equation, Y (output) is a function of Labour (L) and Capital (K). The equation shows a production function relating to constant returns to scale. There is only one commodity, output as a whole, whose rate of production is designated Y. Part of output is consumed and the rest is saved and later invested. Output is produced with the help of two factors of production, capital and labour.

2.4.1 An Increase in the Investment Rate

Suppose an economy has reached at its steady-state level of output per worker. Now suppose that the consumers decide to increase their investment; the impact of the level of k, is given in the below diargam.

Figure 2.4: Increase in Invesment Rate
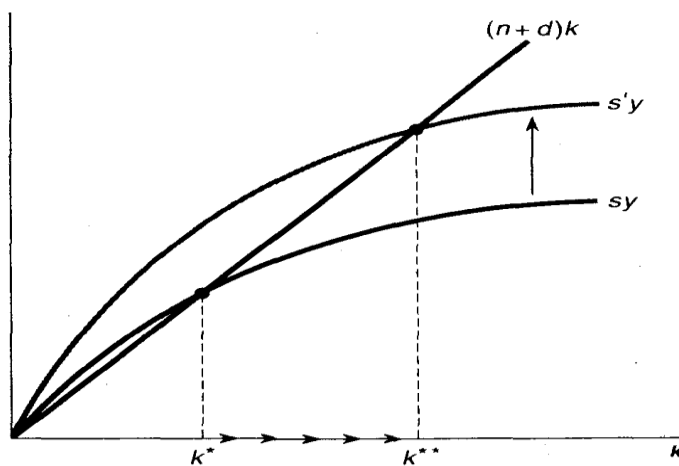
The figure shows the impact of the increase in investment. When there is a rise in investment rate, it shifts the sy curve upward to s'y. At the current value of capital stock, k', investment per worker now exceeds the amount required to keep capital per worker constant, and therefore the economy begins capital deepening again. This capital deepening continues until s'y = (n + d) k, and the capital stock per worker reaches a higher value, indicated by the point k. At this point, the higher level of capital per worker is correlated with the higher per capita output; the economy is now richer than previously (Solow, 1956).

Figure 2.5 Effect of Change in Investment on Growth
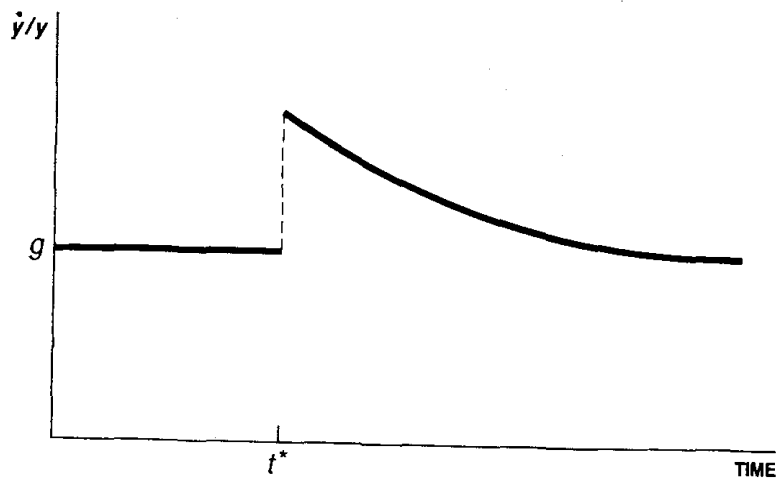
In figure 2.5, the behaviour of the growth rate of output per worker over time is shown. When there is an increase in investment, it will increase growth rate in the long-run.

Figure 2.6 Increment in Population Growth
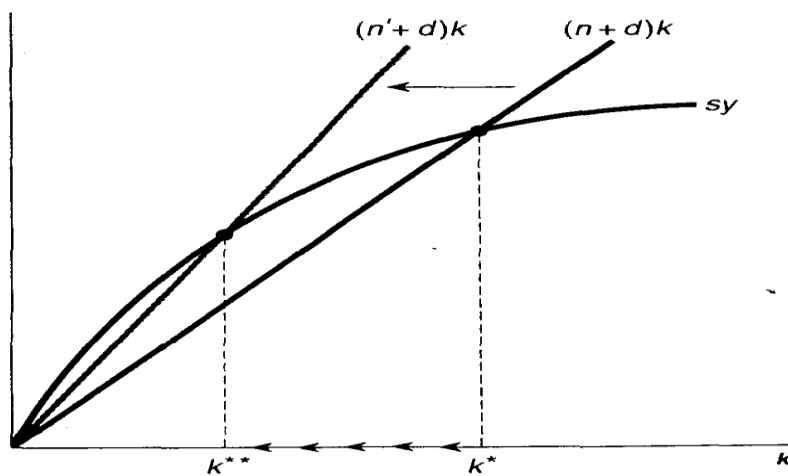
Suppose an economy has reached to its steady state, as the population growth rate rises from n to n'. As a result, the curve (n + d) k will move upward to the left to a new curve (n' + d) k at the current value of capital stock; k*, investment per worker is now not in a position to keep the capital-lobor ration constant in the face of rising population. Therefore, the capital-labour ratio begins to fall. It continues to fall until the point at which sy = (n' + d) k, indicated by k** (Jones, 1998).

2.5 The Romer Economic Growth Model

There are two main elements in the Romer model of endogenous technological change. The aggregate production function in the Romer model describes how the capital stock, K, and labour, Ly, combine to produce output, Y.

$$Y = K^{\alpha} + (ALy)1 - \alpha \text{ ---2.5}$$

Where α is parameter between 0 and 1.

For a given level of technology. A, the production function in the equation displays constant returns to scale in K and Ly. However, when we recognise that ideas (A) are also an input into production, then there are increasing returns.

Figure 2.7 Output per Person in the Romer Model
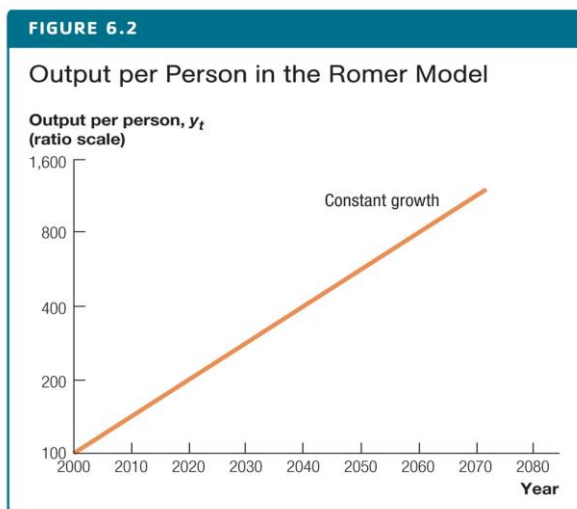
gy= gk = gA ----------------------------------2.6

In the equation A, per capita output, capital-labor ratio, and the stock of ideas. These three should grow at the same rate along a balanced growth path. In addition, if there is no technological progress in the model, then there is no growth (Jones, 1998).
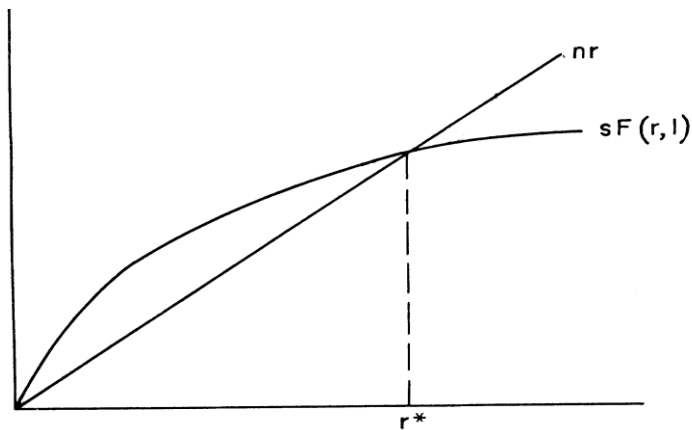
In the diagram, the curve which represents the function nr through the origin with slope. The other curve is the function sF (r, I). The point of intersection is where function nr and function sF (r, I) intersect with each other. If the capital-labor ratio r* is maintained, then the capital and labour will move forward in proportion. By constant returns to scale, real output will grow at the same ratio n, and output person of labour force will also be constant. At any level of the capital-labour ratio, the economy's system will move towards a state of balance growth. If the initial capital stock is below the equilibrium ratio, capital and output will grow at a faster rate than the labour force until the equilibrium ratio level reaches. If the initial ratio is more than the equilibrium is above the equilibrium value, capital and output will grow more slowly than the labour force ratio (Jones, 1998).

2.6 Neoclassical and Endogenous Growth Theories

During the last few decades, there has been a considerable increase in the understanding of economic growth. On the one hand, the theoretical understanding of economic growth, particularly regarding the two broad topics of endogenous technical innovation and increasing returns to scale, has progressed. On the other hand, the interplay between growth and human capital, capital accumulation, life expectancy, population and the role of institutions has led to an increase in empirical literature on cross-country growth (Sachs & Warner, 1997).

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Growth rates vary enormously across countries over long periods of time. Growth has important implications for the prosperity of individuals. Indeed, aggregate growth is most likely the single most important factor affecting individual levels of income. For this reason, understanding the determinants of aggregate economic growth is considered the key to knowing how to improve the standards of living of individuals in the world, thereby reducing world poverty (Barro & Sala-i-Martin, 2003).

Economists have, in some capacity, always been aware of the importance of growth. Yet, at the core of the discipline, the study of economic growth was neglected after the late 1960s, on the verge of rational expectations, revolution and oil shocks. For about 15 years, the focus of macroeconomic research was on short-term studies with the incorporation of rational expectation into business-cycle models, better approaches to policy evaluation and the application of general equilibrium methods to real cycle theory. Then, after being neglected for two decades, the study of economic growth saw a resurgence in the late 1980s. The new study area of economic growth began with models of the determination of long-run growth, an area that is now known as the endogenous growth theory (Barro & Sala-i-Martin, 2003).

Since the late 1980s, long-term issues have attracted the attention of macroeconomists, particularly the effects of government policies on the long-term rate of economic growth. This importance reflects the recognition that the difference between prosperity and poverty for a country depends on its growth over the long-term (Barro, 1990). Barro (1996) used cross-country analysis for a broad panel of 100 countries over 30 years, providing the information required to isolate determinants of economic growth. He analysed real per capita gross domestic product (GDP) on a variety of variables such as initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of the rule of law, lower inflation, and improvements in the terms of trade; his empirical findings suggested

that growth rate is enhanced by these variables. He further added that political freedom has a lower effect on growth but the results noted some indication of nonlinear relation. With low levels of political rights, an expansion of these rights stimulates economic growth.

One of the predictions of the neoclassical model is that, in the absence of continuing improvements in technology, per capita growth must come to a halt in the long-run. This prediction comes from the assumption of diminishing returns to the concept of capital. The long-run data analysis for many countries shows that positive rates of per capita growth can carry through for more than a century and that these growth rates have a clear tendency to decline (Barro & Lee, 1993).

The recent, ongoing work on endogenous growth theory has provided the missing explanation of long-run growth. This long-run approach offers a theory of technical progress, one of the integral missing elements of the neoclassical model. However, the inclusion of a theory of technological change in the neoclassical framework is a difficult task, because the standard competitive assumptions cannot be maintained (Barro, 1996).

In the framework, where new goods and methods of production are created, the long-term growth rate depends mainly on governmental actions such as taxation, maintenance of law and order, provision of infrastructure services, protection of intellectual property rights, financial markets, and other aspects of the economy. The government therefore can affect long-run growth rate. Endogenous growth theories cover new ideas and methods of production that provide possible explanation for long-term growth. Therefore, the cross-country empirical work on growth has drawn inspiration from neoclassical models, extending this to include government policies, human policies, human capital, and the diffusion theory of technology (Barro, 1996).

In the neoclassical models, the central idea is conditional convergence and this receives strong support from the data: income per person grows faster in poorer countries when

measures of government policy, initial levels of human capital, and so on are kept constant. The lower the starting level of real per capita gross domestic product (GDP), the higher the predicted growth rate (Barro, 1996). In cross-country studies, the main finding of theoretical and empirical studies is that growth is determined by human capital, fertility rate, trade, government consumption, the rule of law, political stability, income distribution, inflation and terms of trade (Barro, 1991, 1996; Barro & Lee, 1993; Chen & Feng, 1996; Feng, 1997; Persson & Tabellini, 1992).

All these theoretical and empirical studies confirm conditional convergence of different notions, while Barro (2001) finds that the gap of income per capita between poor and rich nations contracts at a rate of 2% to 2.5 %, if other determinants such as education and the openness of the economy are controlled. "If all economies were intrinsically the same, except for their starting capital intensities, then convergence would apply in an absolute sense; that is, poor places would tend to grow faster per capita than rich ones. However, if economies differ in various respects including propensities to save and have children, willingness to work, access to technology, and government policies then the convergence force applies only in a conditional sense. The growth rate tends to be high if the starting per capita GDP is low in relation to its long-run or steady state position; that is, if an economy begins far below its own target position" (Barro, 1996, p. 4), Barro added that in the 1950s and 1960s, growth theorists recognised the modelling deficiencies and stated that technological progress occurred in an exogenous manner. This instrument can adjust the theory with a positive and constant per capita growth rate in the long run, while maintaining the prediction of conditional convergence.

2.6.1 Determinants of Long-run Economic Growth

The recognition that the determinants of long-run economic growth were the central macroeconomic problem was accompanied in the late 1980s by important advances in the

theory of economic growth. As mentioned previously, this period saw the development of endogenous growth models, in which the long-run rate of growth was determined within the model. One of the key features of these models is a theory of technological progress, a process whereby purposeful research and application lead over time to new products and methods of production and the use of new technologies that were developed in the other sectors of the economies (Barro 1996). The following sub-sections offer a brief discussion of the determinants of long-run economic growth, as featured in the endogenous growth models.

2.6.2 Education and Economic Growth

Governments have a strong inclination towards the use financial services and the provision of schooling at various levels to their people. Hence, public policies on the financing and provision of education (schooling facilities) have a greater effect on a country's economic growth in terms of human capital accumulation. Average years of school attendance is one measure of human capital (Barro, 2000).

Barro (1990) showed that the average years of schooling at secondary and higher levels for males aged 25 and over has a positive and significant effect on the successive rates of economic growth. The estimated coefficient of education implies that an additional year of schooling raises the growth rate on impact by 0.44% per year. This implies that human capital in shape of a workforce educated at secondary and higher levels facilitates the absorption of technologies from more developed foreign countries. Male primary schooling is insignificant for growth, while female primary schooling is positive but also statistically insignificant. The importance of schooling at secondary and higher levels supports the contention that education affects growth through various channels by facilitating the absorption of new technology.

More recently, Benos and Zotou (2014) surveyed the literature which examines the effect of education on economic growth. Specifically, they applied meta-regression analysis to 57

studies with 989 estimates and noted that a substantial number of these publications showed a positive impact of education on economic growth. However, effect of education on growth is not the same across the studies but varies according to several factors. Primary schooling has an insignificant effect on long-run growth rates if it is added to the regressions equation although it has an indirect effect on enhancing growth because it is necessary for training at the secondary and higher levels (Barro, 1996). In contrast, Iqbal and Zahid (1998) used primary school enrolment as an explanatory variable to determine its relationship with per capita real income growth and found a positive relationship between per capita real income growth and primary school enrolment. Their estimated coefficients indicate that an increase in the primary school enrolment-labour force ratio by one percent increases the per capita real income growth by 0.34 percentage points per year. Their findings support the findings of Barro (1991), Becker et al. (1990) and Barro & Backer (1989), which explains that the primary school enrolment to labour force ratio is used as a proxy for human capital stock and enhances economic growth.

Chen & Feng (1999) argued that human capital has a critical role in endogenous growth models, which holds that knowledge-driven growth can lead to a constant, or even increasing, rate of return. They used the number of students enrolled in primary schools relative to the total population as an indicator of human capital accumulation which has a positive effect on the economic growth of China.

In the neoclassical model, the concept of capital can be extended from physical goods to human capital in the forms of education, experience and health. (Lucas (1988), Rebelo (1991), Caballe and Santos (1993), Mulligan and Sala-i-Martin (1993), and Barro and Sala-i-Martin (1995a, Ch. 5). The economy in terms of human to physical capital tends toward a steady state ratio, but it might happen that the ratio moves on from its long-run value initially. The increase of this movement generally affects the rate at which per capita output reaches to its steady state

value (Barro, 1993). Barro (1991) argued that human capital plays a crucial role in a number of models of endogenous economic growth. Barro further added that the countries with higher initial stocks of human capital experience a high and rapid rate of the introduction of new goods and thereby tend to grow faster. Romer (1990) indicated human capital is the main input to the research sector, which introduces the new products or ideas that underlie technological progress. Similarly, Nelson and Phelps (1966) suggested a large stock of human capital makes it easier for a country to absorb the new products or ideas that have been discovered somewhere else. Hence, a follower country with high rate of human capital tends to grow faster because it catches up more quickly with the technological leaders.

The level of growth rate differs across countries over long periods of time. The main reason for this phenomenon is a central issue for economic policy and cross-country empirical work. The findings from cross-country panel regression show that the variations in per capita growth rates relates systematically to a set of significant, computable explanatory variables. The term 'conditional convergence' explains why the growth rate rises when the initial level of real per capita GDP is low relative to the initial values of human capital in the forms of educational attainment and health indicators and for given values of other variables that reflect policies, institutions, and national characteristics. In cross-country analysis, growth relates positively to the rule of law and investment ratio and negatively to the fertility rate, government consumption ratio to GDP, and inflation rate in long-run time. The variables terms of trade and international openness also affect growth (Barro, 2003; Barro and Sala-i-Martin, 2003).

Kaldor (1963) listed several statements related to human capital that he considered as typifying the process of economic growth:

1. Per capita output grows over time, and its growth rate does not tend to diminish.

2. Physical capital per worker grows over time.

3. The rate of return to capital is nearly constant.

4. The ratio of physical capital to output is nearly constant.

5. The shares of labour and physical capital in national income are nearly constant.

6. The growth rate of output per worker differs substantially across countries.

Romer (1989) used adult literacy rate as proxy of human capital. Barro (1989), argued that the literacy rate is attractive in that it relates to the stock of human capital rather than the flow of investment. Literacy rates often appear to be measured in an inconsistent way across countries and are particularly inaccurate for less-developed countries. Barro (2003) demonstrated a significant and positive effect of literacy rate on economic growth. He further added that the importance of literacy rate (human capital) for economic growth is clearly indicated. The aforementioned studies evaluated the importance of literacy rate in increasing economic growth and link it to the stock of human capital, finding it to have a positive effect on economic growth. However, these studies did not specify the measurement of literacy rate in high- and low-income countries, as the quality of education is not the same across countries.

2.6.3 Life Expectancy and Economic Growth

Cervellati & Sunde (2011) report that a number of studies show a robust positive causal relationship between economic growth and life expectancy and human capital. This study describes the role of life expectancy in low-income countries and its comparison with the high-income countries. They indicate the connection of life expectancy to population growth and suggest that if there is improvement in the quality of life, as a result, population will grow, and it will attract more investment. There are different interpretations regarding the effect of life expectancy on economic growth; some of these indicate the positive effect while others find a negative effect.

Low-income countries show greater sensitivity of growth to life expectancy and government consumption than do high-income countries (Barro & Sala-i-Martin, 2003). Life expectancy, which reflects nutrition, health care, are positively related to growth. They further stated that countries with high life expectancy tend to growth faster over a given period than those with a low life expectancy. If life expectancy increases, that indicates a growing population. As a result, a portion of economy's investment is used to provide capital for new workers, rather than to increase capital per worker. Hence, a higher rate of life expectancy tends to raise population growth, which has a negative effect on economic growth (Barro, 1996).

Barro (1996) reveals a significant positive effect on growth from initial human capital in the form of health, which could imply that life expectancy proxies for health status but only broadly for the quality of human capital. According to Ann & Jeon (2006), the impact of life expectancy can be judged in two ways. In one way, increased life expectancy is positive for economic growth when it rises from a low level while in another way, it shows a negative impact when it rises from an already high level.

Kunze (2014) explained the various aspects of the impact of life expectancy on economic growth. Firstly, life expectancy raises the saving rate in an economy and as a result, the rate of physical capital accumulation increases. Secondly, it reduces investments in children's education as population the consumption of elderly people becomes relatively more important. Thirdly, it lowers the amount of endowments of parents' reserves for their children, which negatively affects physical capital accumulation. Finally, life expectancy affects the budget of public expenditure on the education sector through high income tax rates.

Barro (1996) analysed cross-country data of around 100 countries from 1960-1990 where average years of attainment for males aged 25 and over in secondary and higher

education at the start of each period, and life expectancy at birth at the start of each year were used to measure human capital. His empirical results show that the growth rate is enhanced by higher initial schooling and life expectancy. Regarding impact, both secondary schooling and life expectancy have a significantly positive effect on growth and are therefore estimated to raise the growth rate in the sample of 100 countries over an average of 30 years.

In sum, high life expectancy is associated with high income per capita across the countries. The correlation between high life expectancy and high income per capita is positive across the countries. In theory, increasing life expectancy may have different impacts on economic growth. On one hand, a lower life expectancy rate can increase income per capita by increasing the productivity of resources. In the presence of fixed factors of production, a high population growth rate tends to reduce income per capita.

2.6.4 Investment and Economic Growth

Studies on the relation between investment and economic growth have had conflicting results. While some have found a positive relationship, indicating that investment can increase economic growth, others have found a negative relationship, economic growth, indicating that, conversely, investment can reduce economic growth.

According to Barro (1997), in the neoclassical growth model for a closed economy, the saving rate is exogenous and equal to the ratio of investment to output. A higher saving rate raises the steady state level of output per worker and also increases the growth rate. Investment at domestic level, rather than abroad, reflects the domestic prospects for returns on investment, which are connected to the domestic growth levels. In the same study, Barro (1997) expanded his growth model by including the average investment ratio as an explanatory variable. He finds that the estimated coefficient of investment ratio is positive but statistically insignificant. These findings suggest a positive effect of investment ratio on growth in cross-country data analysis.

Investment is an important determinant and it has been considered the engine of growth (Chen & Feng, 1999). Chen and Feng (1999) investigated the source of cross-provincial variation of economic growth in China, finding that investment has a positive but insignificant effect on the China's economic growth. However, according to Levine and Renelt (1992) and Kormendi and Meguire (1985), investment share of GDP has a significant and positive effect on growth. In contrast, Barro (1989) found a weak correlation between growth and public investment. Using recent economic growth theories as a foundation, Barro (1989) covers some empirical regularities about growth, fertility rate, and investment for 98 countries in the period 1960-85. Regarding the correlation between growth rates and explanatory variables, the correlation becomes significantly negative between real per capita growth and its initial level of per capita GDP once initial human capital per person (proxy by school enrolment rates) is kept constant. In addition, the growth rate is substantially positive related to the starting amount of human capital. Thus, poor countries tend to grow with rich countries if there is high human capital per person in the poor countries; otherwise they will go in the opposite direction. The results of the study also implied that government consumption expenditure has a negative relationship to GDP and therefore does not stimulate investment and growth in the long run. Hence, the empirical findings reveal a weak correlation between growth and public investment (Barro, 1989).

Regarding the effect of foreign direct investment (FDI) on economic growth, Borensztein et al. (1998) studied this effect in a cross-country regression framework, using data on FDI flows from the industrial countries to 69 developing countries over the period 1970-1990. Their findings suggest that foreign direct investment is an important source for the transfer of technology, and makes a greater contribution than domestic investment does. However, the level of productivity of FDI depends on the minimum threshold stock of human capital in the host country. Thus, FDI makes a greater contribution to a country's economic growth when

there is a highly absorptive capability of advanced technologies in the host country. Furthermore, Borensztein et al.'s (1998) main contribution is their finding on the dependence of economic growth on the level of human capital in the host economy. They noted a strong positive interaction between FDI and the level of educational attainment (used as a proxy for human capital) but did not find any significant effect in the case of domestic investment and level of educational attainment.

Anderson (1990) emphasised the role of investment in economic growth by analysing an accounting relationship between the rate of economic growth and other indicators representing the rate, allocation and efficiency of investment. His study concluded the importance of efficient use of investment in the promotion of economic growth. He argued that investment plays an important role in the economic growth of an economy through its efficient use, while using investment on unproductive ways can lower the growth rate.

2.6.5 Government Debt and Economic Growth

Schclarek (2004) studied the relationship between external debt and per capita and GDP growth in a panel of 59 developed countries for the period 1970-2002, finding a negative effect of external debt on per capita GDP growth rate across the countries. Pattillo et al. (2002) investigated a large panel dataset of 93 developing countries from 1969-1998 and reported that the impact of external debt on per capita GDP growth was negative for net present value of debt levels above 35-40% of GDP. However, Nguyen et al. (2003) studied the relationship between external debt and economic growth using a panel of 55 low-income countries over the period 1970-1999, noting that the net present value of external debt stood at around 20-25% of GDP, implying that, in the light of Pattillo et al.'s (2002) findings, the debt level was not high enough for it to have an impact on per capita GDP growth.

Rother and Checherita (2010) also investigated the impact of government debt on per capita GDP growth in twelve euro-area countries over the period 1970-2010. Their findings

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show a non-linear impact of debt on the growth with a turning point beyond which the government debt-to-GDP ratio has a detrimental impact on long-term growth about 90-100% of GDP. Confidence intervals for the debt turning point suggest that the negative growth effect of high debt can start from levels of 70-80% of GDP, requiring even more prudent indebtedness policies. They also found that the annual change of the public debt ratio and the budget deficit-to-GDP ratio are negatively and linearly related with per capita GDP growth. Over the same time period (1970-2010), Calderon and Fuentes (2013) studied the relationship between public debt and economic growth in panel data, finding a robust negative relationship between public debt and economic growth. In contrast, Elmendorf and Mankiw (1999) argued that public debt can spur aggregate demand and have a positive effect on economic growth in the short-run, adding that public debt promotes private investment and reduces economic growth in the long-run.

The scope of the majority of studies conducted on the relationship between government debt and economic growth consists of a set of developed countries. As demonstrated above, the studies have contradictory results, with finding a non-linear positive relationship between government debt and economic growth, while others find a negative and linear relationship.

2.6.6 Agricultural Output and Economic Growth

High growth rates in agricultural output are crucial to GDP per worker growth, as agriculture contributes around fifty-four per cent to the overall GDP growth in developing countries. In addition, the agricultural sector also supplies labour and raw materials to the other sectors of the economy, which in turn account for twenty-nine per cent of overall GDP growth rates (Gollin et al., 2002). According to Adelman (2001), the transformation of the traditional agricultural sector into a modern one is considered an important source of growth. Fan et al. (2004) argued that the agricultural sector can increase the income of the poor people of Africa considerably, and that its growth can also boost the agricultural sector itself, which accounts

for two-third of GDP in African countries. The agricultural sector is considered an important sector for the economic development of African countries by providing labour and food to the industrial sector. This sector works as an engine in the industrial sector production process. According to the suggestions of experts, agriculture sector is the only main source of increasing economic growth in the African countries (Diao et al. 2010).

Ligon and Sadoulet (2008) examined a combination of time series and cross-sectional data to estimate regression coefficients linking consumer expenditures by decile to agricultural and non-agricultural GDP. Their findings are consistent, showing that agricultural sector growth is substantially more useful than non-agricultural sector growth for the poorer segments of the population. In addition, their findings show that for better-off segments of the population, the expenditure elasticity of non-agricultural growth is much higher than it is for agricultural growth and it shows the slower growth in the agricultural sector. A sustained increase in agricultural productivity will result from "investments in agricultural research, development, extension and education" (Dewbre & Godoy, 2010, p.20).

The authors estimated the impact of agriculture output on economic growth by using both time-series and cross-section data. They found that agriculture sector output is substantially more important for the poor people that can increase per capita GDP. They found that agriculture output can make more contribution in the domestic GDP than the other non-agriculture output, especially in the countries where majority of the people are engaged with the agriculture sector.

Summary

To sum up, throughout the history of economic growth, from classical economists to modern economists, importance has been given to the role of fundamental indicators in economic growth. The classical economists predicted many explanatory determinants that would become part of modern theories of economic growth. Their studies cover approaches to

the role of physical and human capital, population growth, technological innovations and their relationship with per capita income. Their main conclusions regarding economic growth are that per capita output grows over time and that the growth rate of output per worker differs substantially across the countries. The neoclassical economists described physical and human capital in terms of education and health. They stated that an economy in terms of human to physical capital tends towards a steady state ratio, and there could be a movement from its long-run values in the initial stages.

Some of the key technical aspects of growth theory, especially of Solow and Romer, including the basic diagrams and equations of each approach in the light of Cobb-Douglas model are discussed. It highlights the basic Solow and Romer growth models, their equations are drawn and explained graphically. It also discusses the Solow and Romer models of long-run as well production function.

The long-run approach is an approach which is absent in the neoclassical models. Endogenous growth theory studies the long-run economic growth approach and provides a comprehensive explanation with a theory of technical progress. Endogenous growth theories brought innovations in terms new of ideas and methods of production, as well as analysing the effects of government actions, such as taxation, maintenance of law and order, provision of infrastructure services, property rights and financial markets on long-run economic growth.

The researcher discovered strengths in the review of literature on the economic growth and explanatory variables. These studies observed in cross-country analysis that growth per capita relates to different growth variables. For example, several studies found that in the cross-country analysis, growth has positive relationships with the rule of law and investment ratio and is negatively related with the fertility rate, government consumption and international openness. One study covers the comparative analysis of foreign direct investment (FDI) and

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domestic investment; its findings suggest that FDI makes a greater contribution to a country's growth than domestic investment does.

Education has been considered an important indicator of economic growth. It was found that there is a positive impact of education on economic growth. In addition, one study took public debt as an explanatory variable to analyse its impact on per capita GDP growth in twelve European countries over a period of 40 years and showed that public debt has negative relationship with per capita GDP growth in the selected sample.

The literature review has suggested the application and selection of explanatory variables for making growth models. The idea of selecting different growth variables has also been taken from the growth-related literature. The studies suggest the direction of the relationship between growth and human capital in the long-run economic growth as well as with other social and economic indicators.

2.7 Role of the Financial Sector in Economic Growth

This section of the literature review will explore the relationship between financial sector and economic growth. It also examines the application of broad cross-country growth regressions to the study of conventional finance and growth. These studies aggregate growth over long periods, ten years, twenty years or more, and evaluate the relationship between long-run growth and measures of financial sector development.

The financial sector consists of financial institutions such as commercial banks, development banks, MFIs, stock exchanges, pension funds, etc., regulatory and supervisory institutions such as central banks, and financial instruments such as debt and equity. The existence of financial systems and instruments assist in resource allocation across countries. Financial sector development may be described in terms of the existing variety of financial institutions and instruments, as well as their contribution in terms of improving the efficient allocation of scarce resources (Hermes et al., 2009).

The connection between the operation of the financial sector and economic growth has been one of the most widely researched topics in development economics. Many studies have been conducted on the relationship between financial sector and domestic savings, capital accumulation, technological innovation, and particularly economic growth, and to test these links empirically to identify the directions of the causality and their relative importance using cross-country, country-specific, and industry-level data (DFID, 2004).

The earlier literature on the finance-growth nexus suggests a significant disagreement among economists. For example, Robinson (1952) argues that "where enterprise leads, finance follows", meaning that finance does not affect growth, but rather, it responds to demand from the real sector. Lucas (1988) also disagreed about the strength of the relationship between finance and growth and termed finance as an "over-stressed" determinant of economic growth.

In contrast, Miller (1988) was in favour of the financial contribution to economic growth, arguing that the financial sector makes a positive contribution to economic growth and that this proposition requires serious consideration. In addition, Schumpeter (1911), Gurley and Shaw (1955), and Goldsmith (1969) studied the importance of the finance-growth nexus in knowing of economic growth. Romer (1986) argues that finance has an important role in the endogenous growth theory, via its positive impact on the levels of capital accumulation and savings.

In such studies as King and Levine (1993b) and in Luintel and Khan, 1999) financial development was seen as a cause of growth. Traditional development economics categorises two ways of addressing the importance of financial sector. The first school of thought views financial markets as "essential" to economic activity where "differences in quantity and quality of services provided by financial institutions could partly explain why countries grew at different rates" (King & Levine, 1993b, p. 514). The other strand saw finance as "a

handmaiden to industry, responding passively to other factors that produced cross-country differences in growth". (King and Levine, 1993b, p. 514).

To distinguish the diverse effects on economic growth, a simple model is described by Pagano (1993), as follows: G = AφS- δ, where; G= Growth rate; A = social marginal productivity of capital (physical and human); φ = Proportion of savings directed to investment; S = private saving rate (S/Y); δ = depreciation of capital stock .The ways in which the financial sector may affect economic growth is dependent on the effects of the efficiency of the financial intermediaries, the influence on productivity that the financial system may have, and whether financial development decreases or increases the savings rate (Pagano, 1993).

Greenwood and Jovanovic (1990) show how economic growth allows for the development of financial structures, which in turn increases economic growth when investment is managed more efficiently. They indicate that when the economy's financial structure is developed, exchange and intermediation are inhibited and as a result, the growth rate rises. When levels of income increase, the financial structure expands and economic growth enhances. A fully developed financial structure occurs when the economy has matured and has a higher growth rate than in its early days (Greenwood and Jovanovic, 1990).

Demetriades and Luintel (1996) examined the effects of various types of banking sector controls on the process of financial deepening and economic growth in a case study of India. They found that banking sector controls had a negative effect on the financial development in India. Their results are thus consistent with certain endogenous growth models which explain the influence of financial sector development on economic growth. For example, King and Levine (1993b) found financial sector taxes, including deposit rate ceilings or high reserve requirements, to have a negative effect on financial intermediation, innovative activity and economic growth. Financial development acts as a forecaster of future economic growth rates. Indeed, many studies have found a positive relationship between economic growth and

financial sector. Some of these state that the financial sector plays only a minor role in economic growth and that it is rather he development of the financial market that is a consequence of economic growth (Robinson, 2001; Kuznets, 1995; Luintel and Khan, 1999).

More recent studies suggest the important role of the financial sector in facilitating and sustaining economic growth. Since the end of the 1990s, hundreds of empirical studies have been conducted to test the finance-growth nexus using cross-country, panel data and time series data, using advance econometric techniques. Despite no agreement having been reached as to the positive role of financial sector in economic growth, numerous attempts have been made, supported by empirical evidence. Among this evidence is the following: countries with better-functioning banks and financial markets grow faster; simultaneity bias; better-functioning financial systems reduce the external financing constraints that affect firm and industrial expansion; suggestions for a mechanism through which financial sector development matters for economic growth (Levine, 2004).

Rousseau and Sylla (1999) studied the relationship between finance and growth in the US economy and showed strong support for the concept of 'finance-led growth'. Their analysis covered 17 countries and found that financial sector development encourages economic growth. They also found a positive relationship between external finance and external capitalisation, which implies that an increase in financial development disproportionately increases the growth of industries that are naturally heavy users of external finances. Furthermore, they concluded that financial development affects industrial growth through the expansion of existing establishments and the formation of new ones.

The studies examined the relationship between financial sector and economic growth over a long period of thirty years including some growth determinants as a set of control variables. It also examined the effect of financial sector development on productivity growth

and capital accumulation across the countries, finding a positive impact of financial sector on economic growth across the countries.

Levine (1997a) provides a method to assess how financial sectors impinge on and are influenced by economic growth. The main role of financial sector is the allocation of resources in a time when it is needed (Levine, 1997). Rioja and Valev (2004) extended the work of Beck et al. (2002) in estimating the effect of financial development on the sources of economic growth. They explored whether the effects of financial development on economic growth differ in systematic ways depending on the level of economic development of a country. They used a dataset of 74 countries covering the period 1961-95, using GMM dynamic panel techniques to deal with possible simultaneity of financial development on economic growth. They found that the effects of financial development on economic growth vary according to country. Their results show that finance has a strong positive influence on productivity growth in more developed countries, while its effects on less developed countries are on capital accumulation rather than productivity.

The aforementioned studies present different opinions regarding the finance-growth nexus. Some of the writers argue that finance does not directly affect economic growth but may affect other sectors which can make contribution to economic growth. On the other hand, a group of authors agree that the financial sector plays a positive role in economic growth, as well as that the financial sector has a positive role in on capital accumulation and savings.

2.7.1 Liquid Liabilities and Economic Growth

Liquid liabilities to GDP is one of the most important measures of "financial depth". It refers to the ratio of liquid liabilities of the financial system to GDP and is calculated as currency held outside the banking system plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries (King & Levine, 1993). Liquid liabilities is used to

measure the size of financial intermediaries and the central bank, deposit money banks and other useful financial institutions.

King and Levine (1993a) applied a Barro-type cross-country regressions model to study the relationship between financial development and long-run economic growth, using a multivariate auto-regression (VAR) model on the data of 10 countries. They found the initial level of financial development to be a good future growth forecaster and concluded that finance does not only follow, but also leads to economic growth. Their empirical results show that financial depth has a positive and significant impact on the levels of per capita real income and real interest.

In a similar, but more extensive study, King and Levine (1993b) studied 77 countries over the period 1960-1989. The main purpose of their study is to investigate the effects of capital accumulation, productivity growth channels and construction of additional measurement of the level of financial development on long-run economic growth. The study also analyses whether the level of financial development predicts long-run economic growth, capital accumulation, and productivity growth. They utilised different financial tools to measure financial development, and then examined their true relationship with economic growth. One of these tools is DEPTH, which is a measure of financial intermediaries and equals liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP. Another tool is BANK, which measures the relative degree to which the central and commercial banks allocate credit and it equals to the ratio of bank credit divided by bank credit plus central bank domestic issues. They also used PRIVY, which equals credit to private enterprises divided by GDP.

King and Levine (1993b) studied the empirical relationship between financial development indicators and economic growth. They found a strong positive effect on economic growth of the formal financial intermediary sector relative to GDP, the importance of banks

relative to the central bank, the percentage of credit allocated to private firms, and the ratio of credit issued to private firms to GDP. They further stated that financial development indicators such as rate of physical capital accumulation and improvements in the efficiency of capital allocation are the most important predictors of the growth indicators.

The aforementioned studies investigated the relationship between financial sector development and economic growth using different measures of financial sector development. They also included capital accumulation and productivity growth channels in their analysis. The studies found positive and significant effects of financial sector development on long-run economic growth. They linked growth movements with the expansion of financial sector, when there is an advanced financial sector in terms of introducing new services, methods, economic growth will raise.

Levine (1997) also studied the role of financial development in economic growth, using cross-country data from 1960-89. The regressions results indicate that financial depth in 1960 is significantly correlated with the average growth indicators over the period 1960-1989. These results, and the other most sophisticated time series studied, suggest that the initial level of financial development (liquid liabilities) is a good predictor of subsequent economic growth rates. In addition, the strong correlation between the level of financial development and the long-rate economic growth does not simply reflect contemporaneous shocks that affect both financial development and economic performance.

Ghali's (1999) approach to investigating the link between financial development and economic growth was to apply two financial development measures, i.e. the ratio of bank liabilities to nominal GDP, and the ratio of bank claims on private sector to nominal GDP. He employed the concept of Granger-causality to examine this interaction after testing for co-integration using the Engle-Granger and the Johansen techniques. The empirical results of the

study show that a stable long-run and short-run correlation between financial development ratio and per capita real output makes a significant contribution to economic growth.

Goldsmith (1969) studied the importance of financial sector development in economic growth by using annual data of 35 countries from 1860-1963. His focus was to investigate how development in financial intermediaries can enhance economic growth. He found a positive correlation between financial sector and economic growth, concluding that a well-developed financial sector in developing countries may benefit economic growth and consider it of great importance for economic welfare.

In a more recent investigation, Levine and Demirgüç-Kunt (2008) investigated the impact of financial development on economic growth over the period 1960-1989. They used cross-country growth regressions, panel techniques that make use of both the cross-country and time series dimension of the data, macroeconomic-based studies that analyse the mechanisms through which finance may affect economic growth in individual country casea. They found evidence to suggest a strong, and positive relationship between the level of financial development and economic growth.

The studies reviewed in this section analysed the impact of financial sector and economic growth using cross-section and panel data growth regressions. Overall, they found a strong and positive relationship between the financial sector and economic growth, suggesting that a well-developed financial sector in developing countries can affect economic growth.

2.7.2 Domestic Credit Provided by Banks and Economic Growth

King and Levine (1993) state that bank measures the ratio to which the central bank and commercial banks allocates credit. It is equal to the degree of bank credit divided by bank credit plus central bank domestic assets. The one of the most important financial indicators is domestic credit, which is defined as the credit issued to the private sector of an economy by banks and other financial intermediaries divided by GDP, excluding credit issued to the

government, government agencies and public enterprises, as well as the credit issued by the monetary authority and development banks. It measures general financial intermediary services provided to the private sector (Huang, 2005).

Theories provide inconsistent predictions regarding the question of whether financial sector exerts a positive, causative impact on long-run economic growth. Theoretical studies show that financial instruments, markets, and institutions may rise to ease the effects of information and transactions costs. By emerging to improve market frictions, financial arrangements change the incentives and constraints facing economic agents. Thus, financial systems may have an influence on saving rates, investment decisions, technological innovation, and hence on long-run growth rates across the countries. Leaving causal issues aside, theoretical models explain that reductions in financial market frictions can increase expected rates of return and improve risk diversification opportunities, which may affect growth rates, depending on the general equilibrium effects on aggregate saving rates. In addition, a well-developed theoretical literature examines the dynamic interaction between finance and growth by developing models where the financial system affects growth, and growth leads to the transformation of the operation of the financial system. Therefore, financial development could reflect changes in long-run growth rates whose motive force derive from other sources. In observing this phenomenon, theory has been somewhat complex, but the empirical evidence is also unclear in terms of confirming the true relationship (Demirgüç-Kunt & Levine, 2008).

Luintel and Khan (1999) studied the finance-growth nexus in developed economies by using a multivariate vector autoregression (VAR) model and observed a bi-directional causality between financial development and economic growth in the selected sample of countries. Gregorio and Guidotti (1995) examined the relationship between financial development and economic growth in high, medium and low income countries, finding a

positive effect of financial development on long-run growth of real per capita GDP. Further they added that there was a positive effect of financial development on economic growth in medium and low income countries, but that a weak relationship was observed in the high-income countries. They reasoned that in high-income countries, financial development occurs to a large-scale outside the formal banking sector development. In addition, their findings suggested that the main cause of the positive effect of financial intermediation on growth was the efficiency of investment, but the volume of investment did not have a strong effect on economic growth. The stronger relative effect of improved efficiency of investment on growth was observed in low -income and middle-income countries than in high-income countries. In addition, they suggested that the main effect of financial intermediation on growth is due to its relationship with the efficiency of investment, finding fewer effects of financial development on growth through the volume of investment and the greater role of improved efficiency of investment in low and middle income countries as compared with high-income countries.

Financial development plays an important role in economic growth, as it improves domestic financial markets which may augment the efficiency of capital accumulation and helps in rising the saving and investment rate in the economy (Levine, 1992). Levine (1992) analysed the effects of alternative financial structures on economic growth. In this study, financial institutions were found to raise savings and investments and avoid premature liquidations of capital. Levine (1992) suggests that banks, stock markets, mutual funds, and investment banks increase economic growth by promoting the efficient allocation of investment in various ways.

According to Levine (2004), theoretical models show that financial instruments, markets, and institutions may help to reduce the effects of information and transaction costs. Financial development covers broad areas such as the production of ex ante information about possible investments, close monitoring of investments, application of corporate governance, trading,

diversification, and management of risk, mobilisation and amalgamation of savings and the exchange of goods and services. In this scenario, financial systems may affect saving rates, investment decisions, technological innovation, and affect long-run economic growth rates. Furthermore, financial systems may alleviate the risks associated with individual project, firms, industries, regions, countries. Banks, mutual funds, and securities markets are all used as important means for trading, pooling, and diversifying risks. These risks diversify services provided by financial systems can influence long-run economic growth by changing resource allocation and saving rates. The effective contribution of financial systems to economic growth is the pooling of the savings of individuals, which positively affects growth by increasing savings, utilising economies of scale, and controlling investment indivisibilities (Levine, 2004). In a similar vein, Bencivenga and Smith (1993) show that financial intermediaries that improve corporate governance by economising on monitoring costs will reduce credit rationing and thereby boost productivity, capital accumulation, and growth.

The aforementioned studies focus on how to determine the effect of financial sector development on economic growth. The financial sector helps in easing the constraints on economic growth as well as mobilising savings rates, encouraging investors, and introducing technological innovation, thus raising long-run economic rates across the countries. These studies explain the relationship between finance and growth, as finance can affect growth and growth may affect finance in the long term. The empirical study found a positive relationship between financial sector indicators and economic growth. Financial sector development also helps corporate governance by reducing its monitoring cost, which in turn increases capital accumulation and economic growth.

According to modern theories, there are two precise channels through which the financial sector might influence long-run growth:

(1) Through its impact on capital accumulation (including both human and physical capital).

(2) Through its impact on the rate of technological progress.

Financial institutions provide intermediation services which support the financial sector; mobilise savings for investment activities, motivate and facilitate the inflows of foreign direct investment (FDI) including portfolio investment and bonds, as well as remittances, and optimise the allocation of capital resources, utilising them in a productive way (DFID, 2004). Financial systems effectively pool the savings of individuals, which can have a strong effect on economic development by increasing savings, using economies of scale, and overcoming investment indivisibilities. Moreover, the direct effect of better savings mobilisation on capital accumulation is that it can help in the improvement of resource allocation and enhance technological innovation which may increase long-run economic growth rate (Sirri and Tufano, 1995).

Acemoglu and Zilibotti (1997) studied the links between cross-sectional risk, diversification, and growth. They assume that (i) high-return, risky projects are frequently indivisible and require a large initial investment, (ii) people dislike risk, (iii) there are lower-returns, safe projects, and (iv) capital is scarce. In the absence of financial arrangements that allow agents to hold diversified portfolios, agents will avoid high-return, risky projects because they require them to invest disproportionately in risky endeavours. Acemoglu and Zilibotti (1997) show that financial systems that allow agents to hold a diversified portfolio of risky projects foster a reallocation of savings toward high-return ventures with positive repercussions for growth.

Levine (1996) studied the relationship between finance and growth and showed a positive relationship between the exogenous components of financial development and economic growth, productivity growth, and capital accumulation. His regression analysis

results showed a positive impact of financial development on economic growth. For example, Mexico's value for private credit during 1960-95 was 22.9% of Gross Domestic Product (GDP). He added that the tools of financial systems such as banks and stock markets play a vital role in enhancing economic growth.

Levine and Zervos (1998a) studied many measures of stock market development of 42 countries over the period 1976-93 to examine the correlation between stock market development and economic growth, capital accumulation, and productivity growth. They also analysed other growth determinants and banking sector development. They found a positive correlation between the initial level of stock market liquidity and the initial level of banking development (Bank Credit) with future rates of economic growth, capital accumulation, and productivity growth after controlling for initial income, schooling, inflation, government spending, the black-market exchange rate premium and political stability.

The studies analysed the relationship between financial sector and economic growth by using different financial indicators and estimation methods. They found strong positive relationship between financial sector indicators and economic growth across the countries. The studies also examined the positive effect of banking sector development and stock market on economic growth.

Ahmed and Ansari (1998) investigated the relationship between alternative measures of financial development and economic growth in India, Pakistan and Sri Lanka. The results showed a high degree of correlation between financial sector development and economic growth, supporting the theory that financial development causes economic growth. The financial system can alleviate the risks associated with individual projects, firms, industries, regions, countries etc. Banks, mutual funds, and securities markets all play important roles in trading and diversifying risk. The financial system brings changes in resource allocation and savings rates which can affect long-run economic growth. In addition, financial intermediaries

can also encourage liquidity, reduce liquidity risk and affect economic growth (Ahmed and Ansari, 1998). Hence, the results of this study strongly support the theory that financial sector development causes economic growth.

2.8 Usefulness of the McKinnon-Shaw Hypothesis on Financial Repression

This section discusses the McKinnon-Shaw hypothesis on financial repression and financial liberalisation, its usefulness, and other authors' arguments. It also discusses the empirical evidence on the impact of financial repression on economic growth in the short- and long-run.

Financial repression refers to the idea that a set of government regulations, laws and other non-market restrictions impede the financial intermediaries of an economy from their full and efficient functioning in its financial system. Policies that could be the main reasons for financial repression are interest rate ceiling; liquidity ratio requirements; high bank reserve requirements; capital controls; restriction on market entry in the financial sector; credit ceiling, and; government ownership. Economists have a common statement that financial repression discourages the efficient allocation of capital which in turn, has an impact on economic growth (McKinnon and Shaw, 1973).

McKinnon and Shaw (1973) were the first to introduce the concept of financial repression. In theory, an economy with an efficient and developed financial system can achieve growth and development via efficient capital allocation. McKinnon and Shaw argued that developed and developing countries have very restricted competition with government interventions and regulations. They added that a repressed financial sector affects both savings and investments because the rates of return are lower than what might be obtained in a competitive market. In this type of financial system, financial intermediaries do not play an

active role in channelling savings into investment efficiently, thereby holding back the development of the overall economic system.

According to Ang (2009), the financial repression hypothesis of McKinnon and Shaw (1973) has had an extensive impact on the policy makers and was adopted by many developing countries during the 1970s and 1980s, with the aim of encouraging more financial savings by increasing real interest rates. This statement was further motivated by the argument that financial repression policies were regarded as largely accountable for the poor economic performance of developing countries in the 1960s, where low saving and credit rationing were widely observed.

McKinnon and Shaw (1973) challenged the ideology of financial repression and introduced a new paradigm in the shape of financial sector policies. Their theories proposed that a slant in the financial systems, such as loans issued at a lower interest rate, directed credit programs, and high reserve requirements would reduce savings, hamper capital accumulation, and hold back efficient resource allocation. The exclusion of these distortions would greatly expand the financial system and therefore stimulate economic growth. The McKinnon and Shaw analysis considers financial liberalisation to be the backbone of economic reforms in developing countries. McKinnon (1973) defined 'economic development' as the reduction of great dispersion in social rates of return to existing and new investments under domestic entrepreneurial control. He added that economic development so defined is necessary and enough to generate high rates of saving and investment, the application of best practice technology, and innovation.

In addition, McKinnon and Shaw (1973) argued that financial liberalisation, involving the establishment of higher interest rates that equalise the demand and supply of savings will lead to increased savings in the economy. Regarding income and substitution effects of rises in interest rates on savings that are not clear, Shaw (1973) expresses the view that "savers

may ignore a possibly transitory increase from, say, 4 to 6 percent in rates of return, but they are less likely to maintain consumption-saving patterns when rates of return change, in a context of economic reform, from negative levels to positive 10 or 15 percent and more. Given the relative scarcity of wealth in the lagging economies, the income effect of higher rates of return should not be expected to overwhelm the effects of substitution of more wealth for less consumption now" (McKinnon and Shaw, 1973, p. 73).

Shaw (1973) further suggests that a real growth in financial institutions provides more opportunities to investors to obtain access to more borrowing and have incentives to save and accumulate the equity that makes borrowing less expensive. In reply, in McKinnon's complementary financial repression hypothesis, the desire to hold more cash balances decreases the opportunity cost of saving internally for sudden purchase of capital goods from outside the firm-household.

According to Roubini and Sala -i-Martin (1992), financial repression becomes the cause of inefficient allocation of capital, high costs of financial intermediation, and reduces the rates of return to savers; it is also theoretically clear that financial repression represses growth. The initial McKinnon and Shaw hypotheses assume that liberalisation, which would be associated with higher real interest rates, if there were fewer less restrictions on them, would encourage savings. Here is a good fit of the assumption 'saving is responsive to interest rates'. It states that saving rates would finance a high level of investment, leading to high growth rates. Therefore, it is expected that there would be high saving and investment rate and growth following financial liberalisation (Demech and Struthers, 2006).

Campbell and Mankiw (1990) made further developments in liquidity constraints, credit channels, and financial liberalisation and concluded that not all households have access to credit markets; hence, some household have no ability to smooth their consumption over

time. Thus, in such a situation, liquidity-constrained households, consumption decisions are completely determined by current income. In theory, fewer liquidity constraints will be associated with a consumption boom and a reduction in aggregate saving. They added that there are two types of household, one whose consumption is entirely determined by the evolution of current income, and the other which has easy access to capital markets and can easily smooth their consumption. Such a theoretical development led to challenging the McKinnon and Shaw assumptions that were based on a homogenous household where it was assumed that all relevant households had free access to capital markets within the domestic economy.

The drawback of McKinnon's model is that it ignores the role of intermediation by financial institutions from savings to credit creation. This be very unlikely in under-developed financial markets. The effects of real deposit rates on investment is due to self-finance and credit creation, where the real credit supply raises the demand for money (Fry, 1980). There is a negative effect of financial repression on economic growth but it not necessary that countries should take a laissez-faire stance to financial development and abolish all regulations and controls that form financial repression. Many developing countries where they liberalise their financial markets experience crises to some extent due to the external shocks that financial liberalisation generates. In addition, financial liberalisation can create short-term volatility rather than long-run gains (Kaminsky and Schmukler, 2002).

According to Gemech and Struthers (2006), McKinnon (1973) and Shaw (1973) analysed the benefits of financial repression in terms of reducing its impact on the domestic financial system within developing countries. Their analyses (complementary hypothesis) concluded that relaxing financial restrictions in developing countries can have a positive effect on growth rates as interest rates rise towards their competitive equilibrium. According to this statement, an artificial ceiling on interest rates reduce savings and capital

accumulation, as well as discouraging the efficient allocation of resources. McKinnon (1973) also added that financial repression can lead to dualism in which those who have access to subsidised funding will tend to select relatively capital-intensive technologies, whereas those who have no access to these funds and are not favoured by policy will only be able to apply high-yield projects with less maturity.

Another effect of financial repression is the excessive government intervention in money and credit markets in developing countries where the real interest rates are not able to adjust the market clearance, and therefore other 'non-market' forms of clearing must take their place. These can include different forms of 'queuing' arrangements to 'ration', auctions, and quantitative restrictions, as well as different types of 'bidding' system which be a cause of nepotism and even outright corrupt practices. These explanations of financial repression indicate that not only is the quantity of savings and investment low, but that the level of activity will be very poor. In addition, if the real interest rate is not allowed to clear the money and credit markets, the overall market performance as well as the quality of both savings and investment will be repressed. In a Feast and Famine environment, the typical borrower may borrow too much or, conversely, too little and this very tendency will build up the Feast and Famine problem itself (Demech and Struthers, 2006).

Loayza et al. (2000) stated that the direct effects of financial liberalisation are averse to private saving rates. The real interest rate has a negative impact on the private saving rate. There is a possibility that income effect overcomes the sum of its substitution and human wealth effects. In the short-run, a 1% rise in the real interest rate decreases the private savings rate by 0.25%. To examine the long-run effects of financial liberalisation on capital markets, Loayza et al. (2000) used three different measures of financial liberalisation; capital account liberalisation, domestic financial system liberalisation, and stock market liberalisation. They concluded that liberalisation has been a sustained process in most developed markets, where

capital controls and restrictions are reintroduced in a timely manner. They made a clear difference between developed countries and developing countries in terms of pattern of liberalisation. They added that developed countries first liberalised their stock markets while developing economies first liberalised their domestic financial sector.

The booms and busts of liberalisation were found in short-run, but not in the long-run. It is claimed that financial integration leads to volatile capital markets across the world; stock market cycles become less marked after liberalisation. The short-run effects of liberalisation differ across developed and emerging markets. The evidence shows more booms and crashes from the emerging markets after liberalisation while in the long-run, there are fewer effects of liberalisation in the short-run.

To compare the short- and long-run effects of financial liberalisation, Loayza et al. (2000) collected information on the quality of institutions and the laws governing the functioning of the financial system. The evidence suggests that as the standard of financial institutions improves, financial cycles becomes less pronounced. They also added that due to lack of appropriate incentives, countries tend not to improve their financial sectors before liberalisation, disregarding the typical policy.

Bayoumi (1993) studied the effects of financial deregulation on personal saving. He argues that deregulation produces an exogenous short-run fall in saving, some of which is compensated over time. Deregulation also increases the sensitivity of saving to wealth, current income, real interest rates and other demographic factors in the regions of the United Kingdom. Bayoumi (1993) found that household savings showed an extrinsic reduction related to financial innovation and that much of the decline noted in savings in the 1980s was caused by the rise in wealth. In addition, financial deregulation can also play a direct role in personal saving. Jappelli and Pagano (1994) examined the role of capital market imperfections on aggregate saving and growth. In their analytical framework, they showed

that liquidity constraints on household can increase the savings rate, sound the effect of growth and can also increase welfare.

The above studies present the concept of financial repression and its impact on growth in developing and less developed economies. Financial liberalisation has been considered a backbone of economic reforms in developing countries. One of the main drawbacks of McKinnon's model regarding financial repression is that it ignores the role of intermediation by financial institutions from saving to credit creation. The benefits of financial liberalisation were found more in the short-run than the long-run.

Summary

In sum, these studies show that the direction of relationship between financial sector and economic growth is not simple to declare. There are various studies have been conducted on the relationship between financial sector and economic growth, which give us ideas of economic growth models consisting upon financial sector indicators.

A growing frame of empirical analyses, including all type of studies, such as firm-level studies, industry-level studies, individual country-studies, and a broad cross country comparison, prove a strong positive relationship between the functioning of financial sector and long-run economic growth. Undeniably, the financial sector is designed by nonfinancial developments. Changes in other sectors such as telecommunications, computer systems, advance technology, nonfinancial sector policies, financial organisations, and economic growth itself affect the quality of financial services and the structure of the financial sector.

The ongoing debate on the finance nexus growth subject to qualifications and opposing views, accumulated empirical evidence suggests that financial sector development matters for growth and that reverse causality alone is not enough in driving this relationship. The studies explain the identification problem and the literature addressed this issue via the use of instrumental variables, panel data techniques, establishing the mechanism through which

finance can affect economic growth by using micro and macro level data. The studies also discussed in-depth analysed the financial sector and growth relationship of individual country analysis and then specified the impact of financial sector reforms on growth.

Despite the existence of the weaknesses and strengths, the empirical evidence suggests the importance of financial sector development for growth. To some extent, the evidence can convince the finance growth relationships, but cannot satisfy all the doubts/sceptics, it is strongly recommended and motivated by the policy makers to give some level of priorities to financial sector policies and give proper attention to policy determinants of financial sector development as an important instrument for enhancing economic growth. The study discusses McKinnon – Shaw financial repression hypothesis where they stated that it is a set of government regulations, laws and other non-market restrictions impede the financial intermediaries of an economy from their complete and efficient functioning in their concerned financial systems. Policies that could be the main reasons for financial repression are interest rate ceiling; liquidity ratio requirements; high bank reserve requirements; capital controls; restriction on market entry in the financial sector; credit ceiling, and; government ownership. Economists have a common statement that financial repression discourages the efficient allocation of capital which in turn, has an impact on economic growth

The studies used different methodologies to examine the finance-growth relationships. These methodological techniques have diverse strengths and weaknesses, which give unusual consistent results. The main points have been selected from the recent empirical work on the relationship between finance and growth are; those countries where advance and well developed financial sector is operating their services, it will raise economic growth, particularly both financial intermediaries and markets matter for growth. The size of the banking system and the liquidity of stock markets have positive effects on economic growth.

Well-developed and better-functioning financial sector help in minimizing the external financing constraints that hinder firm and industrial expansion. Consequently, financial sector development matters for growth by easing the financial constraints and provides access to external capital. Both financial intermediaries and markets raise economic growth when other determinants are used for controlling of potential simultaneity bias. In addition, microeconomic-base studies are consistent with the opinion that better developed financial systems reduce the risks and encourages one mechanism through which financial sector development affects economic growth. It is difficult to conclude based on theory and empirical evidence where it is not clear that the financial system automatically responds to economic activity and add an inconsequential addition to the process of economic growth.

Financial sector development is highly unsymmetrical depends on different economies. Studies show that there are many factors which may play an important role in this uneven development. There exists proper literature on the group of factors that plays an important role for the imbalanced development of the financial sectors. The literature review has suggested the use of initial and basic growth determinants as control variables. It gives the ideas of prediction and effects on economic growth. The literature review has also suggested various estimation techniques for the analysis of long-run economic growth in both panel and time series data.

To sum up, the financial sector is held to be an active agent of economic growth. It acts as a forecaster of economic growth rates. Researchers have found mixed relationships between financial sector and economic growth. Some researchers have accorded considerable importance to the role of the financial sector in economic growth while others see it as playing only a minor part. Easy access to financial services will positively affect economic growth. In contrast, in regions where the financial sector is limited only to certain groups of people and people on low incomes are restricted in their access to financial services, the rate of economic

growth will be low. Finally, the financial sector can affect economic growth through efficient financial intermediaries, productivity and savings rate.

2.9 The Role of Micro-Finance in Economic Growth

Theoretical studies have explored the premise that micro-finance promotes a well-functioning financial sector, which is required for efficient resource allocation, leading to increased productivity, large scale investment, and high level of economic growth (Aziz & McConaghy, 2014). The contribution of micro-finance to economic growth can be considered through direct and indirect channels. Micro-finance can promote economic growth through positive spill overs and boosting value creation by entrepreneurship programs at domestic level. Micro-finance can also improve human development indicators such as health, nutrition, and education, leading to a reduction in inequality and poverty. Furthermore, micro-finance contributes to economic growth through interaction with the financial sector development combined with by easy access to finance (financial deepening). The nature of interaction (competition vs. partnership) between micro-finance and the formal financial sector (formal banking) in turn helping to shape the degree and maturity of the financial environment (Cull et al., 2009; Hermes et al., 2009; Ravallion, 2001).

Due to lack of access for poor people to formal financial services, they must approach a limited range of often risky and expensive informal financial services. This constraint makes them unable to participate fully in markets, to increase their personal incomes and to enhance economic growth. Greater access to formal and informal financial services can help generate employment, increase per capita income and reduce poverty in developing countries (DFID, 2004).

The study of DFID (2004) shows the importance of micro-finance for poor and under privilege people who cannot gain access to formal banking services. There are some restrictions in the formal banking sector which have acted as obstacles to the potential of poor

people performance to utilise the resources for the betterment of their future. These obstacles have also slowed down the economic growth in the regions; micro-finance has introduced many financial services for the poor which have been successful in overcoming the restraints. In DFID (2004), direct and indirect channels were used to study the contribution of micro-finance to economic growth. It states that micro-finance promotes economic growth through entrepreneurial programs at domestic level. Furthermore, micro-finance is also very helpful in other sectors of an economy such as the health and education sectors, and in income inequality and poverty alleviation. Moreover, micro-finance facilitates access to finances when poor people cannot approach the formal financial sector to obtain loans and other financial services, thus promoting the financial sector; as a result, economic growth increases.

Buera et al. (2012) compared the redistributive impact of micro-finance in general equilibrium and partial equilibrium. They found a stronger impact of micro-finance on general equilibrium than on partial equilibrium. Furthermore, the impact of micro-finance on aggregate output and capital is weaker in general equilibrium and stronger impact on aggregate total factor productivity (TFP). On the other hand, aggregate total factor productivity (TFC) decreases in partial equilibrium. When the effects of general equilibrium are considered, there will be smaller impact of micro-finance programs on per capita income, because the increase in total factor productivity is balanced by lower capital accumulation due to the transformation of income from high-level savers to low-level savers. However, most people will see a positive impact on their wages due to micro-finance programs.

The Microcredit Summit Campaign (2010) reported that 3,552 micro-finance institutions served 155 million borrowers, and, with the addition of borrowers' households, affected 533 million people, roughly the population of Latin America. In addition, micro-finance loans have made a significant contribution to the GDP of various countries. It was noted if the typical micro-finance utilised on a large scale in an economy can have remarkable aggregate and

distributional impacts and in particular, that the general equilibrium effects through wages and interest rates are of great importance. On the other hand, in partial equilibrium (PE), micro-finance encourages a high level of entry among marginally productive entrepreneurs, increasing the capital/labour demand and output, but reducing the aggregate TFP.

Regarding TFP, Adonsou and Sylwester (2015) studied how it was affected by micro-finance loans, using a sample of 71 developing countries over the period 2002-2011. They found a positive relationship between MFI loans and total factor productivity in their empirical analysis. In addition, they included the investment and education sectors in their study but found no strong evidence of the positive effects of micro-finance loans on these. They suggest that micro-finance can be an important tool for raising income level in developing countries but that the economic impact of micro-finance will not accelerate the development process.

Krauss and Walter (2006) used a different set of MFI indicators to investigate the relationship between these and GDP levels. However, they did not find a strong correlation between the MFI indicators and domestic GDP levels. Ahlin and Jiang (2008) also studied the role of micro-finance in economic development, and considered micro-finance an important addition to the credit market. They used output per capita, inequality and poverty as three important development indicators in their study and suggested that micro-finance can be useful in the promotion of entrepreneurial activities.

The aforementioned studies examined the impacts of micro-finance on total factor productivity and its contribution to growth in developing countries. One report found that micro-finance encourages a high level of entry among marginally productive entrepreneurs, increasing the labour demand and output, but reducing the aggregate total factor productivity (TFP), while another study found positive effect of micro-finance loans on total factor productivity.

Emerson and McGough (2010) studied the importance of microloans for economic growth via investment in human capital. They built a two-period overlapping generation model of household investment decisions with a microloan program designed to finance entrepreneurial activities. They show that the effect of microloans on educational outcomes of recipient households depend on both the impact on easing the resource constraint on educational investment and the increasing opportunity cost of education. These two forces have major implications for growth. In addition, they describe the conditions in which microloans can lead to lower growth and lower welfare via the discouraging effect on human capital investments. They show that microloans have introduced new resources into an economy for people's benefit, although they can have mixed effects on economic growth. Generally, when there is greater access to finance at low cost, micro-finance would enable the poor segment of an economy to gain access to microloans and to spend more on their children's education, thereby indirectly contributing to the efficiency and growth of human capital, which in turn can promote economic growth.

Alimkhamedova (2013) studied the indirect impact of micro-finance on economic growth through the development of financial sector. He suggested four ways in which micro-finance can promote the development of the formal financial sector. Firstly, financially sound and sustainable micro-finance institutions can support market deepening that in turn promotes financial sector development. Secondly, micro-finance has been using an important economic tool in those countries where their inefficient governance negatively affects development programs. Thirdly, micro-finance can be helpful in the promotion of financial market maturity in both developed and developing countries. Finally, micro-finance can be used as an important source to help domestic level financial reforms by overcoming the constraints.

Wooley (2008) examined the correlation between the performance of micro-finance institutions (MFIs), both financially and in terms of outreach and domestic GDP growth. He

found no significant relationship between micro-finance performance, outreach and domestic GDP growth. This may be the result of a biased sample and suggests that there are some MFIs which are able to perform financially well in term of outreach without any impact on the domestic level growth rate. The result suggests that MFIs can operate efficiently in the time of low domestic GDP growth, when they do not need to keep maintain high financial success at the expense of outreach. He further added there might be certain other prominent characteristics of MFIs which make them robust and resilient.

The study of Wooley (2008) investigated the growth in financial or outreach of micro-finance and GDP growth rate across the countries. It used year over year percentage in financial or outreach variables as dependent variables and domestic GDP growth rates as the independent variable. The study did not find any significant correlation between changes in any of the micro-finance performance indicators and domestic GDP growth, suggesting that the performance of micro-finance institutions is unlikely to have any significant correlation with domestic GDP growth. The study did not show any significant relationship, even without adding dummy variables. This could also be attributed to the possibility that there may not have been enough variations in domestic GDP growth within a certain country. This present study has been conducted differently, and we cannot use the same methodology in our analysis. The reason is that the Wooley used the performance of MFIs as a dependent variable and put domestic GDP growth as the independent variable. It clearly shows that the author is trying to examine the effect of domestic GDP on the MFIs' outreach or performance. His aim is to find out what the effects would be of fewer or more variations in the country's domestic GDP growth on the MFIs performance and outreach across the countries. The study suggests that, overall, MFIs' performance is not connected with the domestic economy. In contrast, in our study, we examine the impact of micro-finance on economic growth across countries. Our main concern is with the relationship between micro-finance variables and GDP per capita in

different regions. In our study, we use GDP per capita as a dependent variable while other financial sector, micro-finance sector, and regions are used as explanatory variables.

Economic growth could generate more jobs for the poor segment of the economy. In addition, a higher rate of growth could reduce the wage differentials between skilled and unskilled labour at a later stage of development, which would benefit the poor (Galor and Tsiddon, 1996). Perroti (1993) states that high growth could increase tax revenues, which would enable the government to allocate more fiscal resources to welfare spending such as health, education, and social protection, hence benefiting the poor. As a result, poor people would be able to make a greater investment in human capital. Finally, higher economic growth increases capital accumulation and provides more funds to the poor for investment which increases their income (Aghion and Bolton, 1997).

There are two important elements which can be regarded the main sources of growth and success of the micro-finance: group lending, and inside peer pressure. Group lending refers to people being classified into different groups by their own choices, and loans are extended to these groups accordingly in the micro-finance structure. The incentive structure of the loans is designed in such a way that providing loans to each member of the group is conditional to the repayment of the loans obtained by other members of the group; in this way, the obstacle of providing collateral for poor people has been resolved. Inside peer group pressure means that the regulations and structure of micro-finance are designed in such a way that each member of the group persuades the others to pay back their loans and there is therefore no need for external enforcement (Besley and Coate, 1995).

Hence, many MFIs have transformed their status from mission-driven, generally incompetent non-government organisations into regulated financial institutions partially or entirely funded by private capital. Apart from the modification, other factors such as introducing better management, clear reporting standards, credit ratings, and the formation of

workable industry associations, as well as regulation of new financing alternatives for MFIs, including deposit taking and the issuance of domestic and international securities. Deposits play an important role in obtaining banking licences and are considered the most economical and secure form of financing for MFIs, while the local savings pool is often constrained. The additional approach of MFIs to capital markets enables them to fulfil the local demand and finance growth. The greater maturity of capital market financing also reinforces the financial structure of MFIs and may make them less vulnerable to external factors such as currency devaluations, bank runs, and macroeconomic crises. In addition, capital markets can enhance the efficiency of financial intermediation considerably as well as reducing the financing costs of MFIs. Registering as financial institutions means complying with more rigorous liquidity, capital adequacy, and reporting qualities, but these do not apply to all MFIs. These are best suited for institutions located in regions where operating costs are high and the local savings pool is small or where governments set limits on lending rates for regulated financial entities (Krauss and Walter, 2009).

By comparing the market risk of the leading MFIs with that of the leading emerging market institutions, it has been shown that there is significantly less sensitivity with global capital markets in terms of income and assets. Regarding the relationship with domestic GDP, micro-finance institutions demonstrated significantly higher sensitivity regarding their profit margin, but significantly lower sensitivity regarding their portfolio quality. The studies showed that MFIs can have different values for international portfolio investors to be able to diversify away from a country's risk exposures. They argued that the difference in market risk between micro-finance and the other emerging market institutions is based on the non-public ownership structure that decreases the dependence on capital markets, keeping national and international market exposure of micro-finance clients low, and keeping the operational and financial

leverage low. As the micro-finance industry expands and matures, the market risk relative to MFIs will increase.

The aforementioned studies examined the expanding credit and the impact of credit on income generation and other financial services but included other products. This present study also examines some specific traits of micro-finance clients. The studies of micro-finance and the financial sector development also reveal that institutions will sacrifice outreach to keep the required financial performance, and had faced problems over economic downturns. The literature has also examined micro-level financial market imperfections and how they can be solved to spark income-generation and financial development. The economic agent may increase income faster through investment by engaging in the financial system. Micro-finance institutions can develop and improve financial techniques for reaching the poor at a lower cost and lower risk. While some techniques are quite labour intensive and not easily transferable to the banking sector, other techniques can be used by the financial sector to reach further into the market, which will help to accelerate the pace of development in the banking sector. If micro-finance institutions can attract sufficient capital and operate in a financially sound manner, they have the potential to become significant players in providing financial services and credit.

According to Remenyi and Quinones (2000), those households who access micro-finance have higher levels of income than those who do not access micro-finance. They compared the changes in income level of participants and non-participants in micro-finance. They noted that in Indonesia, there was a 12.9% increase in the annual average income of the micro-finance borrowers, while a rise of only 3% was observed in the income of non-borrowers. In Bangladesh, a 29.3% rise was noted in the annual average rise in the income level of borrowers and a 22% rise in the income of non-borrowers of micro-finance. They also recorded increases in the annual average income level in Sri Lanka and India. In Sri Lanka, there was 15.6% increment occurred in annual income due to micro-finance, while a

9% rise occurred in the income of those who did not use micro-finance. Finally, in India, a 46 % rise in annual average income was reported from micro-finance borrowers compared to 24% from non-borrowers.

Summary

In recent decades, the growth in the micro-finance sector in developing countries indicates that these services are used as an alternative means of financing and could thus play an important role by filling the gap of an immature formal financial sector. Many theoretical and empirical studies suggest that micro-finance could have a significant effect on the formal banking sector and growth, and that the relationship between financial sector development and micro-finance is based on improved access to finance. The easier the access to the formal and informal financial services, the more people will access, thus raising their income level.

Micro-finance is used for various purposes, such as enterprise financing, asset accumulation, consumption smoothing, improving quality of life, improving the education and health sector etc. The micro-finance sector makes a contribution to GDP by increasing the income level of the borrowers. Micro-finance has direct effects, increasing productivity in different sectors of the economy where micro-finance is used for productive aims, but also has indirect effects on other sectors of the economy.

The findings of various studies show that the micro-finance sector facilitates access and to finance, which leads to improving the financial sector, and thus has positive effects on economic growth. Financial sector development shapes the structure of the economy in various ways, both direct and indirect, leading to sustainable economic growth, and helps to reduce income inequality in the economy. There are certain restrictions in the formal banking sector which have acted as obstacles to the potential of poor people to utilise their resources for the betterment of their future lives. These obstacles have also slowed down economic growth in many regions, while micro-finance has introduced many financial services for the poor which

have been successful in overcoming the restraints. Micro-finance promotes economic growth through entrepreneurial programs at domestic level. Furthermore, micro-finance is also very helpful in other sectors of an economy such as the health and education sectors. Micro-finance also increases the outreach and financial performance of MFIs, all of which contribute directly to economic growth. In conclusion, micro-finance is an important element in enlarging the financial inclusion of households, thus promoting economic growth via various channels.

Chapter 3: Methodology and Data

3.1 Introduction

The selection of the standard growth determinants to set up a basic cross-country growth model and then to analyse the /impact of those determinants in long-run economic growth is a challenging task due to the diversity of available variables. Furthermore, the major problem in most empirical studies is the selection of financial variables that help to indicate the level of financial services produced in the economy, and how their macro-economic impact on the economic growth in the long-run can be measured. The financial sector has been introducing new financial techniques and services for their clients' convenience and for economic development. Micro-finance is one of the most important innovations of the financial sector which has positive effects on the economic growth (Aziz & McConaghy, 2014).

With the progression of the formal financial sector, the informal financial sector, that is, micro-finance has developed in the last few decades. Theoretical and empirical studies have explored the various impacts of the formal financial sector on economic growth but the connections with micro-finance have not yet been investigated. In this light, the main aim of this study is to investigate the impact of micro-finance on the economic growth across countries. This study will use Barro (1991) type long-run economic growth cross-country approach to measure the impact of micro-finance on long-run economic growth in a sample of 124 countries with the data drawn from 1995-2013. The main contribution of this study is to fit conventional finance and micro-finance variables into Barro-type long-run economic growth and then to examine their impacts on long-run economic growth in a cross-country data. The study will use the average growth rate of real per capita GDP as the dependent variable and the initial and averages of the variables as independent variables with regions as dummy variables.

To evaluate the relationship between finance and growth driven by simultaneity bias, current studies use instrumental variables to extract the exogenous component of financial sector development and micro-finance. To address this, it is necessary to select instrumental variables that explain cross-country differences in the financial sector and micro-finance but are uncorrelated with economic growth. Standard instrumental variable procedures can be used to determine the relationship between finance and growth (Demirguc-Kunt and Levine, 2008).

Cross-country studies of long-run growth characteristically assess the strength of partial correlations between growth and economic determinants that are almost always determined jointly with growth (King and Levine (1993). According to Johnston & Pazarbasioglu (1995), the endogenous growth approach examines the indicators of growth by regressing average per capita growth on a set of standard growth variables using cross-sectional data; this is helpful in highlighting the indicators that may affect economic growth.

The great strength of the cross-country approach is that it provides the breadth of experience to evaluate government policies and other determinants of long-term economic growth. However, there are also problems related to measurement and estimation using cross-country data. Several objections have arisen regarding these areas in cross-country studies, but the informational benefits from cross-country data supersede these objections (Barro, 1996). According to Chen & Feng (1998), in a cross-country approach, the average values of the relevant variables are taken over a fairly long period of time. The main advantage of this approach is that it allows the examination of the long-run trends of economic growth.

This chapter is structured as follows: section 3.2 presents the estimation method; section 3.3 presents data description, section 3.4 discusses regression model, section 3.5 describes the variables, and; section 3.6 presents the descriptive statistics.

3.2 Estimation Method

In the first instance, we built a long-run economic growth model with basic growth variables. These variables are literacy rate, life expectancy, primary school enrolment, investment, agricultural output, and government debt. We then augmented this baseline long-run economic growth model with financial sector variables, i.e. liquid liabilities and domestic credit provided by the financial sector. To analyse the impact of micro-finance on long-run economic growth, we added micro-finance variables, i.e. gross loan portfolio and the number of active borrowers, to the long-run economic growth model. The regression model also included regions as dummy variables to capture regional differences. The OLS estimation technique is applied for the analysis. In the regressions, the growth rate of real per capita GDP is used as the dependent variable taken on average for each country over the period 1995-2013, and the explanatory variables are the initial and averages of growth variables, conventional finance and micro-finance variables over the period 1995-2013. There are a total of 124 countries.

3.3 Data Description

To estimate the impact of micro-finance on long-run economic growth, this study used three different groups of variables, which are the following: standard growth variables, conventional finance variables and micro-finance variables. The data were collected from several sources. The data on growth variables were collected from World Bank Indicators, the International Financial Statistics database, the Penn World Table, the Barro-Lee database and OECD tables.

The data on conventional finance variables were collected from World Bank Indicators, the Beck & Demirguc-Kunt database and the International Financial Statistical Database, while micro-finance data were collected from the Micro-finance Exchange (MIX) market, as well as the CGAP and Bank Scope database. The data ranges from 1995 to 2013 for growth

and conventional finance and micro-finance variables, therefore covering 19 years. The 124 countries are divided into four regions, Asia; Africa; Latin America; Eastern Europe, North America & Oceania, used as dummy variables.

3.4 Regression Model

In this section, the regression model, used to assess the impact of micro-finance on long-run economic growth, is presented.

$$g_i = \alpha + \beta_1 X_{i0} + \beta_2 X_i + \beta_3 Y_i + \beta_4 Z_{i0} + \beta_5 Z_i + \varphi r_i + \varepsilon_i$$

$i = 1,......,N$

3.4

Where g_i is the growth rate of real per capita GDP. The growth rate is the average from 1995 to 2013 for each of the country. X_{i0} is the set of initial real GDP per capita (1995), initial life expectancy (1995), initial literacy rate (1995), and initial primary school enrolment (1995). X_i is the set of averages 1995-2013 of growth variables, i.e. agricultural output, government central debt and investment ratio. Y_i is the set of averages 1995-2013 of conventional finance variables, i.e. liquid liabilities to GDP and domestic credit provide by the financial sector. Z_{i0} is the set of initial micro-finance variables, i.e. the gross loan portfolio and the number of active borrowers, and Z_i is the set of averages 1995-2013 of gross loan portfolio and number of active borrowers. φr represents regional dummy variables which capture regional differences and ε is the error term. Finally, the subscript i represents country and the subscript r represents regions.

Table 2: Variables Description and Units

Variable	Description
Real Per Capita GDP	RPC GDP in constant in USD with 2005 base year (in Dollars)
Growth Rate Real Per Capita GDP	Average Percentage Real GDP Growth Rate (% of GDP)
Initial Literacy Rate	Adult Total (% of people age 15 and above)
Initial Life Expectancy	Number / number of years a new infant would live
Initial Primary School enrolment	The average years of primary education in the adult population/ total primary school enrolment expressed as a percentage of adult population
Agriculture Output	Percentage (%) of the GDP
Investment	Gross fixed capital formation expressed as percentage of GDP
Government Debt	Total expressed as percentage of GDP
Liquid Liabilities	Average change in growth of broad money supply, in percentage of GDP
Domestic Credit provide by financial sector	Total credit in percentage of GDP
Gross Loan Portfolio	USD (million) and region wise (USD billion)
Number of Active Borrowers	Number, the total number of borrowers/people having account with MFI measured in thousands
Regions	Dummy Variables in number

3.5 Variables Description

The dependent variable is economic growth, measured by the average growth rate of real per capita GDP for each country over the period 1995-2013. The empirical literature on the determinants of economic growth has grown considerably and has suggested numerous explanatory variables. A central question for economists is the selection of appropriate explanatory variables for an economic growth model. One problem is that economic theories are not sufficiently precise to pinpoint the exact determinants of growth. For example, in the literature review we explored several growth theories, each of which suggests a different set of potential explanatory variables.

The explanatory variables of this study are literacy rate; agricultural output, investment; life expectancy; primary school enrolment, government debt; liquid liabilities to GDP; domestic credit provided by the financial sector (% of GDP); gross loan portfolio, and; number of active borrowers, as well as regions as dummy variables.

3.5.1 Dependent variable

The dependent variable is the average growth rate of real per capita GDP in USD currency from 1995 to 2013. Growth rate of GDP per capita is based on constant local currency. Aggregates are based on constant 2005 international U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchasers" prices is the sum of gross value added by all resident producers in the economy, plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources" (World Bank Indicators, 2015).

According to Sachs and Warner (1997, pp. 185-186), "production theory explains output per worker, but most studies examine output per capita. During demographic transition (and

for other reasons) there may be a transitional gap between population growth and the growth of the labor force, as the age structure of the population changes". Barro (1991) used a cross-sectional study analysis; that is, the growth rate and the explanatory variables were observed only once per country. The main reason for extending a panel setup is to augment the information from the sample, although important extra information was obtained through cross-sectional (between-country) and the time series (within-country) aspects. The long-run growth and the specific timing between growth and its determinants are not well explained at the high frequency characteristics of "business cycles". In order to obtain some additional information, the average growth rates of real per capita GDP over periods of five or ten years were taken (Barro, 1996).

3.5.2 Independent variables

3.5.2.1 Real GDP Per Capita

"GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. It is the ratio of real GDP and total population". (World Bank Indicators, 2015)

3.5.2.2 Literacy Rate

In this study, literacy rate is used as a proxy for human capital. "Adult (15+) literacy rate (%) total is the percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations. This indicator is calculated by dividing the number of literates aged 15 years and over by the

corresponding age group population and multiplying the result by 100" (World Bank Indicators, 2015).

Microeconomic and macroeconomic evidence suggests that human-capital development, particularly in children, is partially the result of positive externalities within the family and community. Literate parents raise healthier and more educated children; in a literate community, formal expenditure on education will also produce literate children. Therefore, within a range, real GDP per capita growth rate is likely to be positively correlated to actual human capital stock (Sachs & Warner, 1997).

3.5.2.3 Agricultural Output

Agricultural output is used as total agriculture sector growth/GDP. "Agriculture includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production" (World Bank Indicators, 2015). Godday and Dewbre (2010, p. 12) define agriculture output as "the amalgamation of the returns to land, contribution of land, labour and capital used in agriculture". As farmers mainly own their own fields, and provide capital and labour to the agricultural sector, it is considered a good indicator of income. Investing in agricultural research, development, extension and education result in a sustained increase in agricultural production.

3.5.2.4 Investment

"Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings" (World Bank Indicators, 2015). Some of the empirical studies of cross-country growth have found a

positive relationship between investment and economic growth (e.g., Barro, 1996; DeLong and Summers, 1991; Mankiw, Romer, and Weil, 1992).

"A positive coefficient on the contemporaneous investment ratio in a growth regression may reflect the positive relation between growth and investment, rather than the positive effect of an exogenously higher investment ratio on the growth rate. This reverse effect is likely to apply for open economies. Even if cross-country differences in saving ratios are exogenous with respect to growth, the decision to invest domestically, rather than abroad, would reflect the domestic prospects for returns on investment, which would relate to the domestic opportunities for growth" (Barro, 1996, p. 23).

3.5.2.5 Life expectancy

"Life expectancy at birth indicates the number of years a new-born infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life" (World Bank Indicators, 2015). If the quality of health is improving, this indicates that the population is growing; then a portion of the investment of the economy is used to provide capital for new workers, rather than to raise capital per worker. Hence, high life expectancy has a negative effect on economic growth (Barro, 1996). "Notably, the low-income countries exhibit more sensitivity of growth to life expectancy and government consumption than do the high-income countries" (Barro & Sala-i-Martín, 2003, p. 534).

3.5.2.6 Primary School Enrolment

"Total enrolment in primary education, regardless of age, expressed as a percentage of the population of official primary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition" (World Bank Indicators, 2015).

3.5.2.7 Government Debt

"Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans. It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government. Because debt is a stock rather than a flow, it is measured as of a given date, usually the last day of the fiscal year" (Word Bank Indicators, 2015).

3.3 Conventional Finance Variables

3.3.1 Liquid liabilities (% of GDP)

Liquid liabilities to GDP is used as proxy for financial depth. It indicates the overall size of financial sector. Liquid liabilities are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travellers' checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents" (World Bank indicators & International Financial Statistics, 2015).

Liquid liabilities to GDP are one of the most important measures of "financial depth" and is equal to the ratio of liquid liabilities of the financial system to GDP. It consists of currency held outside the banking system plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries (King & Levine, 1993). According to Levine and Zervos (1998), liquid liabilities only measure financial depth but do not measure whether the liabilities are from banks, the central bank, or from other financial intermediaries, nor does the financial measure recognise where the financial system allocates capital.

3.3.2 Domestic credit provided by the financial sector (% of GDP)

Domestic credit provided by the financial sector is used as proxy for banks. "It includes all credit to various sectors on a gross basis, except for credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies" (World Bank Indicators and International Financial Statistics, 2015).

Levine (1997) and King and Levine (1993, 722) state that banks measure the ratio at which the central bank allocates credit. It is equal to the degree of bank credit divided by bank credit plus central bank domestic assets. Huang (2005, p.14) states that domestic credit is one of the important financial indicators and it is the credit issued to the private sector of an economy by banks and other financial intermediaries divided by GDP, excluding credit issued to government, government agencies and public enterprises, as well as the credit issued by the monetary authority and development banks. It measures general financial intermediary services provided to the private sector.

3.4 Micro-Finance Variables

3.4.1 Gross loan portfolio

Gross loan portfolio is the total value of the all outstanding loans, whether paid or not, including current, delinquent and restructured loans, but not loans that have been written off. It does not include the interest received on the loans (MIX Market, 2015). The variable 'gross loan portfolio' is relevant for several reasons. Firstly, it represents the financial performance of a MFI, including donations made to an institution. Secondly, it is a financial indicator that

is most represented in the data. Finally, it is coordinated chronologically with the gross domestic product (GDP) (Woolley (2008).

3.4.2 Number of Active Borrowers

The number of active borrowers refers to the total number of clients or accounts that are active at a given point in time (MIX Market, 2015). The outreach of the micro-finance institutions is measured in terms of the number of active borrowers as well as the total loan portfolio. Micro-finance institutions (MFIs) reach more clients in the less-developed banking regions; once accounts are active in those countries, inflation has a negative influence on the number of total borrowers and on profitability (D'Espallier & Vanroose, 2009). The number of active borrowers is used to measure the scale of outreach (Wooley, 2008).

3.5 Regional variables

The data are divided into four regions which capture regional differences. These regions are Asia; Africa; Latin America; Eastern Europe, North America & Oceania.

Table 3: Descriptive Statistics

Variable	Observation	Mean	S.D	Minimum	Maximum
Initial Real per capita GDP	124	4662.6790	1168.8410	121.3221	81788.9521
Growth rate real per capita GDP	124	2.6709	5.1697	-2.6805	45.2984
Initial Literacy rate	75	5.1506	3.4429	5.3214	99.4304
Initial Life expectancy	124	58.4932	9.9479	27.7389	73.8756
Initial Primary school enrolment	116	6.2217	4.8626	3.3252	61.1266
Agriculture output	124	1.3108	6.4641	2.2795	66.69051
Investment	124	2.2451	6.8613	2.2111	66.6905
Govt debt	124	8.3947	22.3724	2.9411	60.2134
Liquid liabilities	124	4.3921	3.2812	-1.3822	19.9421
Domestic credit	124	54.9634	49.1521	-57.9321	45.6264
Initial Gross loan portfolio	116	64.8315	3.8651	4.2932	1960.7631
Gross loan portfolio	116	53.2417	19.3158	7.2321	184.3012
Initial number of active borrowers	112	85.9606	23.6086	26	234143
Number of active borrowers	112	91.6211	8.3411	7.1421	9513.15
Regions	124	2.0347	0.9656	1	4

Table 2 shows the descriptive statistics of the variables of this study. The table contains the total number of observations; mean; standard deviation; and minimum and maximum values of each variable in this study. The mean values explain the average impact of the explanatory variables on growth rate. The mean value of agriculture output, liquid liabilities are 1.3108 and 4.3921 respectively. These values are low, which indicates the countries have low average agriculture output and less developed financial sector. The mean value of regions is 2.0347 because the variable is measured as a dummy variable. The mean values of domestic credit provide by the financial sector and gross loan portfolio is 54.96 and 53.24 respectively, which mean there is a considerable amount of loans provide by banks and micro-finance institutions (MFIs). The mean value of the number of active borrowers is 91.62, which means there is a great number of MFIs clients. The mean value of growth rate of real per capita GDP is 2.6709. Minimum and maximum indicate the minimum values and maximum values of the variables.

3.7 Summary

This chapter discussed the estimation techniques and described the data used in this study. This chapter also discussed the importance of the estimation techniques used in the analysis of the model. This study uses simple regressions to assess the impact of micro-finance on the growth rate of real per capita GDP (long-run economic growth) across the countries. The data were collected from World Bank Indicators, financial statistics and MIX. Data were gathered for three types of indicators, i.e. standard growth determinants, conventional finance and micro-finance indicators. The data were collected for a total of 124 countries, and the descriptive statistics of the data were also discussed briefly.

The next chapter analyses and discusses the results of this study.

Chapter 4: Results and Discussion

4 Introduction

Since the late 1980s, long-term issues have attracted the attention of macroeconomists, particularly the effects of government policies on the long-term rate of economic growth. The precise timing between growth and its determinants in the long-term theory has not been explained well at the high frequencies characteristic of business cycles. In the estimation method, growth rates of average five years and ten years were considered; based on the availability of data, these averages can be extended. The estimation approach may be satisfactory because the residuals of growth-rate equations are basically uncorrelated across the periods. In any event of estimation, the regressions explain the relation between growth rates and earlier values of the explanatory variables (Barro, 1996).

 Developing countries attach great importance to the financial sector in the pursuit of their goal to improve economic growth. The association between the performance of the financial sector and economic growth has been one of the most heavily researched areas in development economics. The majority of the studies analyse how the structure and the development of an economy's financial sector affect economic growth through domestic savings, capital accumulation, technological innovation, or vice versa, as well as analysing these connections using cross-country data (Zhuang et al. 2009).

Researchers have various opinions regarding the role of micro-finance in economic growth. Although various case studies have been conducted using different techniques to study the effects of micro-finance on economic factors such as income, employment, output, and poverty, the issue remains inconclusive in terms of analysing the impact of micro-finance on economic growth. Thus, we have to analyse conclusively whether micro-finance may affect long-run economic growth, so that the findings may help policy makers and provide

some useful suggestions in the long run. Micro-finance is more usually applied in the rural areas of a country where the financial market has not been developed to capture the key macroeconomic indicators. Therefore, it is important to investigate the impact of the conventional finance and micro-finance on economic growth.

Micro-finance is evolving rapidly; specifically, it is evolving from a focus on group lending technologies to a much broader emphasis on providing a range of financial products required by different categories of poor people. However, at the level of evaluation, many questions remain to be answered concerning the impact of micro-finance on the different dimensions of economic growth, poverty and other household outcomes. In countries where micro-finance has a sufficiently long history and has reached a certain level of industrialisation, it can be expected that it will shape the path of micro-finance to growth (Sultan & Masih, 2016).

4.1 Regression Model

The general regression model and its description are presented in Section 3.4 of Chapter 3. In this section, the regression model used to assess the impact of standard growth determinants, conventional finance and micro-finance determinants on long-run economic growth, is presented. The model is given in equation (4.1).

$$g_i = \alpha + \beta_1 X_{i0} + \beta_2 X_i + \beta_3 Y_i + \beta_4 Z_{i0} + \beta_5 Z_i + \varphi r_i + \varepsilon_i$$

$i = 1,.......,N$

4.1

The rest of the chapter is structured as follows. The next section, section 4.2, presents the table containing the regression model. Section 4.3 offers a short description of the model. Section 4.4 examines the impact of basic growth determinants, conventional finance and micro-finance on long-run economic growth. Finally, Section 4.5 summarises the chapter.

Table 4: Regressions on Cross-Country Growth Rates Real Per Capita GDP (gi)

over the period 1995-2013

VARIABLES	GRGDPPC
Constant	7.064
	(5.835)
Real Per Capita GDP1995	-0.000333***
	(3.62e-05)
Literacy Rate1995	-0.0188*
	(0.0273)
Life Expectancy1995	-0.0598*
	(0.0948)
Primary School Enrol 1995	0.0515*
	(0.0458)
Agricultural Output	0.0753*
	(0.0906)
Investment	0.102**
	(0.0481)
Government Debt	-0.00225**
	(0.00965)
Liquid Liabilities	-0.142*
	(0.165)
Domestic Credit	0.0276**
	(0.0196)
Gross Loan Portfolio1995	1.04e-08
	(8.21e-09)
Gross Loan Portfolio	0.0138**
	(0.0412)
Number of Active Borrowers1995	2.20e-06
	(2.17e-05)
Number of Active Borrowers	-0.000480**
	(0.000292)
Africa Dummy	-3.673***
	(1.193)
ENAO Dummy	-3.155*
	(1.848)
LA Dummy	-3.675**
	(1.609)
Observations	124
R-squared	0.561

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes to Table 4: The system has one equation, where the dependent variable is the average growth rate of real per capita GDP for 1995-2013.The explanatory variables are the initial values of real per capita GDP, literacy rate, life expectancy and primary school enrolment, while the other explanatory variables are the averages of agricultural output, investment and central debt, liquid liabilities and domestic credit provides by the financial sector over the period 1995-2013. The remaining explanatory variables are the initial (1995) and averages of gross loan portfolio and number of active borrowers over the period 1995-2013. The regional four dummy variables are Asia, Africa, ENAO and LA. Standard errors of the coefficient estimates are shown in parentheses. The R-squared is the coefficient of determination indicates the goodness-of-fit test of the regression. The R-squared value is 0.561, which indicates 56% of variation in the gi is explained by the explanatory variables. In the table, region Asia is used as a constant of the regression equation because the Software 'STATA' displays /gives one region dummy (Asia) as a constant.

4.3 Impact of Micro-finance on Long-run Economic Growth

This section explains the results of an empirical investigation of the growth determinants, conventional finance and micro-finance determinants that affect growth rate of real per capita GDP across the countries during the period of 1995-2013. This section presents the estimation results of the equation using the compiled cross-section data of the 124 sample countries. Table 1 shows the regression results for the average growth rate of real per capita GDP. The OLS method is applied to a panel of 124 countries observed from 1995-2013. The dependent variable is the average growth rate of real per capita GDP over the period 1995-2013 and the explanatory variables are the initial values of real per capita GDP, literacy rate, life expectancy and primary school enrolment, the averages of agricultural output, investment and central debt, liquid liabilities and domestic credit provides by the financial sector over

1995-2013, and the initial values and average values of gross loan portfolio and number of active borrowers over 1995-2013.

4.4 Regressions Results and Discussion

4.4.1 Initial level of Real Per Capita GDP

For given values of the other explanatory variables, the neo-classical model predicts a negative coefficient on initial GDP. The coefficient on the initial GDP has the interpretation of a conditional rate of convergence. If the other explanatory variables of a model are kept constant, then the economy tends to approach to its long-run position at the rate indicated by the magnitude of the coefficient of initial level of GDP (Barro, 1996). If the notion of convergence is correct, initial levels of income should be negatively related to the subsequent growth rates. Thus, we expect the initial real per capita GDP to have a negative effect on growth. Barro (1991) states that in the basic neoclassical growth model, which incorporates diminishing returns to capital, the growth rate tends to be inversely related to the absolute level of initial per capita GDP.

In neoclassical growth models with diminishing returns to capital, such as those of is Solow (1956), Cass (1965), and Koopmans (1965), a country's per capita growth rate likely to be inversely related to its initial level of income per person (Rebelo, 1987). For the correct notion of convergence, the initial levels of real GDP must show a negative correlation with the subsequent growth rates. "The convergence hypothesis maintains that (1) if countries are similar in terms of preferences and technology, the steady state income levels for them will be the same, and with time, they will tend to reach the same level of income and (2) the provided technology should be equally shared by the public, where all countries will eventually attain the same steady state growth, where the steady states of the economies refer to the economy where per capita output, capital stock, and consumption growth at a common

constant rate are equal to the exogenously given rate of technological progress. However, judging whether countries are in their steady states can be problematic. One way to bypass this problem is to examine the relationship between initial income levels and subsequent growth rates" (Feng & Chen, 1999, pp. 7-8).

In the regression model of this study, the estimated coefficient of real per capita GDP i.e. -0.000333 (se. = 3.62e-05) is highly significant and implies a conditional rate of convergence of 0.03% per year, which is slow in the sense that it will take long time to get half way to the steady state level of output. This is an approximate result because the growth rate is observed as an average over 19 years, rather than at a point in time. Comparing to the convergence rate of this study, slow rates of convergence have been noted/observed for regional data for the U.S states, Canadian provinces, Japanese prefectures, and main regions in Western European countries (Barro, 1996 and Barro and Sala-i-Martín, 1995a).

4.4.2 Initial Human Capital

The first important step in estimating the regression equation is to include an appropriate set of explanatory variables. Many growth studies have the problem of putting a small number of appropriate exogenous variables (Warner & Sachs, 1997. Chen & Feng (1999) state that human capital has a critical role in the endogenous growth models which hold that knowledge-driven growth that can lead to a constant, or even increasing rate of return.

The three human capitals, life expectancy at birth (an indicator of health status), literacy rate and primary school enrolment, which indicate the status of human health and stock of capital, are taken at the start of each period. The initial values of literacy rate and life expectancy in the regressions show a negative and statistically significant effect at ten per cent on the growth rate of real per capita GDP while primary school enrolment shows a positive and significant effect at ten per cent on the growth rate of real per capita GDP.

Regarding impact, initial literacy rate and initial life expectancy rate are therefore estimated to reduce the growth rate of real per capita GDP by a substantial 1.88 and 5.9 percentage points per year respectively, while initial primary school enrolment is estimated to increase the growth rate of real per capita GDP by 5.15 percentage points per year.

Regarding life expectancy, Barro (1996, p. 19) states that "as an interpretation, it may be that life expectancy proxies not only for health status but more broadly for the quality of human capital in the developed countries". Barro (1996) used secondary and higher school enrolment and life expectancy at birth as human capital at the start of each year in cross-country data. His results show that growth rate is enhanced by the initial values of human capital. Regarding impact, both the secondary schooling and life expectancy have a positive and statistically significant impact on growth, leading to the interpretation that they may raise the growth rate in the sample of 100 countries over the average of 19 years.

Iqbal and Zahid (1998) studied the relationship between primary schools' enrolment and growth rate of real per capita income and reported a positive relationship between them. The estimated coefficient indicates that a one percent increase in primary school enrolment-labour force ratio increases the per capita real income growth by 0.34 percentage points per year. Their results support the findings of Barro (1991), Becker et al. (1990) and Barro and Backer (1989), explaining the positive role of primary school enrolment in economic growth.

4.4.3 Agricultural Output

In developing countries, high growth rates in agricultural output are very important and contribute around fifty-four per cent to overall GDP growth. In addition, the agricultural sector also supplies labour and raw materials to the other sectors of the economies which accounts for a twenty-nine per cent contribution to overall GDP growth rates (Gollin et al. 2002). The study of the intertemporal dynamics of economic development and growth

explains the importance of agricultural output for an economy to overcome the issue of fixed supply of natural resources and for the achievement of sustained economic growth (Yang and Zhu, 2004).

We estimate the impact of agricultural output on growth rate of real per capita GDP across the countries. In this study regressions model, holding all the other factors constant, it can be seen that the estimated coefficient of agricultural output is positive and statistically significant at ten per cent. Its estimated value i.e. 0.0753 shows a positive relationship between agricultural output and growth rate of real per capita GDP, indicating that a one percentage point increase in agricultural output, leads to higher growth rate of real per capita GDP (gi) by 0.0753 percentage points. This suggests that agricultural output has a positive impact on growth rate of real per capita GDP.

4.4.4 Investment

We find investment has a positive and statistically significant effect at five per cent on growth rate of real per capita GDP. The point estimate, i.e. 0.102, implies that investment has a positive and significant effect on the growth rate of real per capita GDP and hence it is concluded that investment can enhance growth in the long run. The role of rate, allocation and efficiency of investment in the economic growth is positive when it is used efficiently, although it can be negative when proper care is not taken in the use of investment (Anderson, 1990).

Barro (1996) studied the role of investment in economic growth using panel data from 1960 to 1990. He found a positive and significant impact of investment on long-run economic growth, indicating that when there is an increase of one standard deviation in investment, it can raise the growth rate by the same ratio at a typical cross-country level. Some empirical studies of cross-country growth such as DeLong and Summers (1991) and Mankiw, Romer

and Weil (1992) have reported a positive role of investment ratio. Levine and Renelt (1992) found that investment share of GDP had a significant and positive effect on economic growth.

4.4.5 Government Debt

In the regression model of this study, we find government debt has a negative and statistically significant effect at five per cent on the growth rate of real per capita GDP. The point estimated value, i.e. 0.0025, shows a negative and statistically significant relationship between government debt and growth rate of real per capita GDP, indicating that as the level of government debt increases, the growth rate can fall.

Calderon and Fuentes (2013) studied the relationship between public debt and economic growth using panel data from 1970-2010. They found a robust negative relationship between public debt and economic growth. Patillo et al. (2002) studied the relationship between per capita GDP growth and external debt in a sample of 93 developing countries from 1969-1998. They reported a negative impact of external debts on per capita GDP growth. Schlarek (2004) examined the relationship between gross government debt and per capita GDP growth in developed countries and found a negative impact of external debt on per capita GDP growth in a panel of 59 developed countries for the period 1970-2002.

4.4.6 Liquid Liabilities to GDP

Liquid liabilities is one of the most important financial indicators. Liquid liabilities to GDP is used as a proxy for financial depth and indicates the overall size of financial sector. Rajan and Zingales (1998) show that countries with well-developed financial systems will have a higher growth rate than countries where the financial system is less developed. Based on the approach to financial services, the growth rate will be higher where people have easy access to financial services than in countries where access is limited or restricted.

In the regression analysis in this study, liquid liabilities have an estimated value of -0.142, which is negative and statistically significant at ten percent on growth rate of real per capita GDP. This point estimate shows that as the level of liquid liabilities increases, the growth rate of real per capita GDP falls in the long run. In conclusion, liquid liabilities have a negative effect on long-run economic growth.

Levine (1997) studied the role of financial development using cross-country data from 1960-89. The regression results indicate that the financial depth in 1960 was negatively correlated with the average growth rates over the period 1960-1989. These results and the other sophisticated time series studies suggest that the initial level of financial development (liquid liabilities) is a good predictor of subsequent growth rates. According to King and Levine (1993a, & 1993b), the level of financial development measured by various financial indicators is positively correlated with economic growth. In addition, they found that increasing the financial depth (measured by the ratio of liquid liabilities to GDP) would increase per capita income growth rate by almost one percentage point per year.

4.4.7 Domestic Credit Provided by the Financial Sector

The second most important financial indicator is the domestic credit provided by the financial sector. Domestic credit provided by the financial sector is used as proxy for banks and includes all the credit to private sectors. In this study's regressions, the domestic credit provided by the financial sector has an estimated value of 0.0276, which has a positive and statistically significant effect at five per cent on growth rate of real per capita GDP. This point estimate shows that as the level of domestic credit provided by the financial sector increases, the growth rate of real per capita GDP can increase.

Loayza and Ranciere (2006) studied the relationship between finance and growth in a sample of 75 countries over the period 1960-2000 using pooled mean group estimator

techniques. The reason for using this approach is to allow for heterogeneity in the parameters of growth regressions as well as to distinguish the short- and long-run effects of finance on growth. Loayza and Ranciere (2006) found a positive and statistically significant impact of finance on long-run growth.

In conclusion, domestic credit provided by the financial sector has a positive impact on long-run economic growth. In this respect, our result for financial development confirms Demirguc-Kunt and Levine's (2008) results showing a positive role of financial sector development in long-run economic growth. Domestic credit provided by the financial sector has a statistically significant positive impact on real per capita GDP, indicating that the more credit is available at banks, the higher economic growth will be.

4.5 Micro-finance Variables

The two micro-finance variables, i.e. gross loan portfolio and the number of active borrowers, are relevant for several reasons. First, they represent the outreach and financial performance of the micro-finance sector. The gross loan portfolio represents the total amount of loans in the micro-finance sector in all regions, while the number of active borrowers represents the active accounts which micro-finance institutions have live at the time. An increase in both factors show the outreach and financial performance of the sector. Second, gross loan portfolio and the number of active borrowers is the financial indicators represented most frequently in the data. Finally, these two variables are coordinated chronologically with the GDP growth. The study uses the number of active borrowers and gross loan portfolio to measure the depth of outreach. These two variables are the most appropriate because they offer clear and simple measurements of the outreach of MFIs to poor clients.

4.5.1 Initial Level of Micro-Finance Variables

Oli (2018) investigated the impact of micro-finance institutions on Nepal's economic growth using secondary data of 24 MFIs from 2012 to 2017. He employed regression analysis techniques to examine the relationship between GDP and MFIs and between CPI and MFIs. He found a positive relationship between MFI factors and GDP and CPI, which indicates a positive contribution of MFIs to Nepal's GDP and CPI. He further extended his analysis to total loan, total deposit and money supply and found that they also had a positive impact on GDP and CPI.

In this present study's regression model, the results show a positive and statistically insignificant effect of the initial values of gross loan portfolio and number of active borrowers on the growth rate of real per capita GDP across the sample of 124 countries. Regarding impact, the initial number of active borrowers and gross loan portfolio are therefore estimated to have a positive but statistically insignificant effect on the growth rate of real per capita GDP by a substantial 1.04 and 2.20 percentage points per year.

The initial value of gross loan portfolio is positive and statistically insignificant. It indicates that gross loan portfolio has no impact on economic growth in the short-run. There could be several reasons for this; first, due to short time, it may not be possible for the MFIs to manage loans properly in the short-run. Second, there is also possibility that the clients have limited time to manage their loans in small and medium-size enterprises. The high interest rate could be an obstacle for the clients to repay back the loans in the short-run.

4.5.2 Gross Loan Portfolio

In this study, we used regression analysis to investigate the impact of micro-finance variables, i.e. active borrowers and gross loan portfolio, on the growth rate of real per capita GDP. Gross loan portfolio is an important micro-finance indicator which indicates the total

loans of the MFIs. The results show a positive and significant relationship between gross loan portfolio and growth rate of real per capita GDP. In the regression model, its estimated value, i.e. 0.0138, shows a positive relationship between gross loan portfolio and growth rate of real per capita GDP. This indicates that a one percentage point increase occurring in gross loan portfolio leads to higher growth rate of real per capita GDP by 0.0753 percentage points. This suggests that gross loan portfolio has a positive impact on growth rate of real per capita GDP, indicating that both the variables move in the same direction in the long-run. In conclusion, the first micro-finance variable, i.e. gross loan portfolio, has positive impact on long-run economic growth. The more the volume/capacity of the gross loan portfolio, the more will be the outreach and the high will be the level of economic growth in the long-run. Due to the availability of more funding, MFIs will attract more clients, and the easier access is to micro-finance loans, the more positive will be the effect on economic growth.

Sultan and Masih (2016) analysed the impact of micro-finance on Bangladesh's domestic growth (GDP) over the period 1983-2013. They found a positive and significant impact of micro-finance on Bangladesh's growth rates. They added that even after 1-year horizon, micro-finance can hold the position of leading variable in terms of significant impact on Bangladesh's economic growth rate. Their interpretation is based on the findings of various studies where micro-finance services were investigated in relation to their leading to financial inclusion and the development of financial sector. Therefore, it is concluded that micro-finance has positive effects on Bangladesh's economic growth.

Donou-Adonsou & Sylwester (2015) investigated the impacts of micro-finance on economic growth and total factor productivity (TFP) across a sample of 71 developing countries over the period 2002-2011 using the GMM method. Their results show a positive and significant effect of micro-finance on both economic growth and total factor productivity across the countries.

Sharma and Puri (2013) analysed the effects of microloans on India's GDP from 2006 to 2012 by employing regression techniques. They found a strong correlation and a positive and significant effect of microloans on India's GDP, implying that microloans have the potential to make a positive contribution to India's economic growth.

4.5.3 Number of Active Borrowers

Dandana and Nwele (2011) studied the importance of micro-finance in modern society in terms of providing micro-credit to small and medium scale enterprises in both the agricultural and industrial sectors. They state that over the past few decades, the true contribution of micro-finance sector can be seen in the enhancement of economic growth across a number of developing countries. Krauss and Walter (2006) investigated the relationship between domestic gross levels and a set of different MFI indicators using regression analysis. However, they did not find any correlation between MFI indicators and GDP levels.

The second micro-finance variable in this study, the number of active borrowers, is included in the set of explanatory variables to examine whether the number of active borrowers in the selected countries matters for the growth rate of real per capita GDP. This is an important micro-finance indicator which explains the outreach of the MFIs. It measures the size of lending activities of an MFI. The estimated coefficient of the number of active borrowers is -0.000480, which has a negative and statistically significant effect at ten per cent on the growth rate of real per capita GDP. This point estimate implies that a one percentage point increase in the number of active borrowers will decrease the growth rate of real per capita GDP by 0.00048 percentage points. This suggests that the number of active borrowers has a negative impact on growth rate of real per capita GDP, indicating that both the variables, i.e. growth rate of real per capita GDP and the number of active borrowers, move in the opposite direction in the long-run. For efficient use of micro-finance loans, MFIs

should apply strict rules and regulations which prevent borrower not using the loan for their personal social needs. MFIs' management teams should create awareness among their clients of the use of the loans for productive purposes. Central banks should cooperate with MFIs in their funding and financial services.

In conclusion, the result shows that the second micro-finance variable, the number of active borrowers, has a negative and significant impact on long-run economic growth. This negative relationship between the two variables could be due to several reasons. Firstly, most of the MFIs are in rural areas where they are easily accessible for poor people who are excluded from the formal banks. When they approach MFIs for loans, they are given these on condition that they open their own self-employed small-scale business with the loans given. Most of the borrowers are poor; they must meet many needs. Most frequently, they are unable to utilise the loans for the purpose they were given them. As a result, they spend the money on their sons' or daughters' weddings or on other unproductive activities where they do not obtain any financial benefit. In the end, they are unable to pay back the loan at a high interest rate which decreases their income level further, which in turn negatively affects growth rates. In other words, due to high interest rates, they are unable to return the loans they have taken from MFIs, which affects their individual income as well as the efficiency of the MFIs.

4.6 Test of Hypothesis

The hypothesis regarding the long-run economic growth states that micro-finance does not have any impact on long-run economic growth. Given the regression results of the model, we reject this hypothesis. Therefore, on the basis of the available evidence it is concluded that micro-finance does have a statistically significant impact on long-run economic growth.

4.7 Regional Dummy Variables

A common view is that African and Latin American regions have lower growth performance than other regions. It is apparent that, if the fact of being in Africa or Latin America is held constant by other explanatory variables, regional dummies would be insignificant in equations for growth and other exogenous variables (Barro, 1989).

The regional dummy variables are shown in Table 2. The number of countries is divided into four regions: Asia, Africa, LA, and ENAO. Each region has a set of countries. The main purpose of dividing the data into regions is to capture regional differences in terms of impact of growth, financial sector and micro-finance indicators on long-run economic growth. These regions give us a clear image on the impact of standard growth determinants, financial sector and micro-finance indicators on long-run economic growth across the sample of 124 countries from 1995 to 2013. This indicates the level of performance of the growth indicators, financial sector and micro-finance sector in these four regions. As this study is focused on the impact of micro-finance on long-run economic growth in many countries, it is easy to compare its outreach and performance in these regions. It gives a good indication to governments and financial institutions that which region needs more efficient incentives to improve their micro-finance sector.

The dummy variables have estimated coefficients of 7.064 for Asia, -3.673 for Africa, -3.155 for ENAO and -3.675 for LA. The estimated coefficient for Asia is positive and insignificant. The estimated coefficients for Africa, LA, and ENAO are negative and statistically significant at 1%, 5% and 10%. Moreover, the results show that Asia is positively related to the growth rates. This indicates that an increase in gross loan portfolio leads to increase in growth rate. The effects of growth indicators, financial and microfinance indicators were found negative and significant in Africa, LA, and ENAO. This indicates that an increase in these variables in these three regions leads to a decrease in economic growth.

The study finds a significant impact of the formal financial sector and micro-finance indicators on log-run economic growth during the sample period 1995-2013. In the long-run, micro-finance holds the position of leading variable in the creation of a significant impact on growth rates. Regarding the links between micro-finance and the financial sector, it is interpreted based on findings of micro-finance literature, that the micro-finance sector facilitates improved access to finance, which leads to financial inclusion and improves the financial sector, therefore having a positive impact on the economic growth. In addition, micro-finance envisages the integration of the financial needs of households into a country's financial system and hence there are high expectations that it will have positive effects on growth.

To sum up, the results show that the values of all standard growth determinants, conventional finance and micro-finance variables have statistically significant impacts on long-run economic growth across the countries. The results have some similarities with the past literature in terms of impact on long-run economic growth. Long-run economic growth was analysed on two micro-finance determinants, i.e. gross loan portfolio and number of active borrowers, and the results indicate different impacts on long-run economic growth.

Chapter 5 Conclusion

5.1 Concluding Observations

This study has reviewed and reported on the micro-finance sector, as well as investigating the impact of micro-finance on long-run economic growth. In addition, this study also investigated the impacts of basic growth determinants and conventional finance determinants on long-run economic growth across countries. To identify the impact of micro-finance, conventional finance and basic growth determinants on long-run economic growth, secondary data gathered from 124 countries, which included gross loan portfolio, number of active borrowers, liquid liabilities, domestic credit provides by financial sector, literacy rate, primary school enrolment, life expectancy, investment, agriculture output and government debt, were used.

This is the first study to offer an empirical assessment of macro-level data, comprising micro-finance, financial sector and basic growth determinants. Thus, it stands in contrast to previous studies assessing the impact of micro-finance on poverty and other economic and social indicators. These previous studies are all micro level studies, while this present study finds the statistically significant impact of micro-finance on long-run economic growth. This chapter presents the summary of the main findings, considers the policy implications of the findings and makes some suggestions for future research.

5.2 The Dataset

The results of this study are based on the data gathered by the author from multiple resources. To estimate the impact of micro-finance on long-run economic growth, this study used three different groups of variables, which are the following:

- Basic economic growth indicators

- Conventional Finance /Financial sector indicators

- Micro-finance indicators

The data were collected from multiple sources. The data on growth variables were collected from World Bank Indicators, International Financial Statistics database, Penn world table, Barro-Lee database and OECD table.

The data of conventional finance variables were collected from World Bank Indicators, the Beck & Demorguc-Kunt database and the International financial statistical database, micro-finance data were collected from the Micro-finance Exchange (MIX) market, CGAP and Bank Scope database. The data range is from 1995 to 2013 for the study variables; the data therefore cover 19 years. There is a total of 124 countries, divided into four regions. These regions; Asia, Africa, Latin America & Eastern Europe, North America & Oceania used as dummy variables.

5.3 Impact of Basic Growth Determinants on Long-run Economic Growth

This study has examined the empirical relationship between economic growth and its standard determinants in the long-run over 19 years in 124 countries. The data now available for a broad panel of countries over 19 years provides the information necessary to divide indicators/determinants of economic growth. With respect to the regressions results, the evidence signifies that the growth rate of real per capita GDP is enhanced by primary school enrolment, agricultural output, and investment and reduced by life expectancy, literacy rate and government debt. The empirical evidences also show the positive and negative impacts of standard determinants, i.e. literacy rate, primary school enrolment, agricultural output, investment ratio, life expectancy and government debt in this study, in the four regions.

For given values of real per capita GDP, growth depends positively on agriculture output, investment and primary school enrolment and negatively on literacy rate, life expectancy and government debt. In addition, for given values of real per capita GDP, high initial primary

school enrolment predicts higher growth. Finally, the study also fulfils the condition of convergence where the estimated coefficient of initial real per capita GDP is negative interpreting the conditional rate of convergence.

The great strength of the cross-country approach is that it provides the breadth of experience required to examine government policies and other determinants of long-term economic growth. On the other hand, the cross-country data also create problems related to measurement and estimation. Most of the criticism of cross-country empirical work focus on the problems of measurement and estimation but Barro (1996) is of the opinion that the informational benefits supersede these drawbacks. It is clear that this viewpoint will be more credible if more progress can be made make in overcoming measurement and estimation problems.

5.4 Impact of Conventional Finance Indicators on Long-run Economic Growth

This study has also examined the empirical relationship between conventional finance indicators and per capita real GDP over 19 years in 124 countries. It pays specific attention to the role of financial sector development in the economic growth of developing countries. We find that conventional finance variables such as liquid liabilities have a significant but negative effect while domestic credit provided by the financial sector have a positive and significant effect on economic growth in the long-run. With respect to the regression results, the evidence signifies that the growth rate of real per capita GDP is enhanced by domestic credit provided by the financial sector and reduced by liquid liabilities. Based on the empirical results in this paper, we conclude that financial sector development can affect economic growth in different directions.

5.5 Impact of Micro-Finance Indicators on Long-run Economic Growth

Finally, this study has examined the empirical relationship between micro-finance determinants and per capita real GDP over 19 years in 124 countries. We find that micro-

finance variables, such as gross loan portfolio, have a positive and significant effect, while active borrowers have a negative and significant effect on long-run economic growth across the countries. With respect to the regression results, the evidence signifies that the growth rate of real per capita GDP is reduced by active borrowers while growth rate of real per capita GDP can be increased by gross loan portfolio in the long-run. Based on the empirical results in this study, we conclude that both financial sector development and the micro-finance sector can variously affect economic growth.

In the light of the above concluding remarks, the general conclusion is that there is evidence to support the role of micro-finance in long-run economic growth across the countries. In addition, standard growth determinants and financial sector variables have also been shown to have an impact of long-run economic growth. The OLS estimators of the cross-section data reveal that micro-finance can be used as alternative financial source for the enhancement of long-run economic growth.

This study finds a significant impact of micro-finance on long-run economic growth. For the micro-finance variables, a statistically significant impact was found for both micro-finance variables. In addition, this study finds that basic growth and conventional finance variables have impact on long-run economic growth. Hence, with the available evidence, we accept the study hypothesis regarding the impact of micro-finance on growth rate of real per capita GDP and conclude that micro-finance has significant impacts on long-run economic growth.

To conclude, we believe that a number of implications that may be useful to academics and policy makers emerge from our regression results. Firstly, the results indicate that the micro-finance sector and the formal financial sector are interrelated. This relation is very important in view of the fact that the micro-finance sector is commercialising at an

increasingly rapid rate, while the formal financial sector is taking greater interest in micro-finance markets. Thirdly, the growth of the micro-finance sector is contributing to the growth of real per capita income. Finally, micro-finance indicators can affect long-run economic growth.

5.6 Policy Implications

The study finds a significant impact of the formal financial sector and micro-finance indicators on the log-run economic growth during the sample period 1995-2013. In the long-run, micro-finance holds the position of leading variable in creating a significant impact on growth rates. The global micro-finance sector claims to promote long-run economic growth in the form of raising real per capita GDP by providing loans to people who cannot access the formal financial sector. The provision of loans to the poor can enable them to raise their income and in turn, the income of the entire nation. However, the findings of this study show that the micro-finance sector can increase economic growth in the long-run.

The results on micro-finance suggest that new and modern micro-finance services for the poor should be introduced. Governments should relax their strict policies regarding the promotion of the micro-finance sector. The micro-finance sector should raise awareness among its clients of the role of micro-finance in economic growth. Therefore, we conclude that micro-finance should be promoted by policy makers and social and economic practitioners in developing countries as a useful instrument for the enhancement of economic growth.

Government policies involving stability and expansion should support the micro-finance sector by passing legislation that encourage MFIs to mobilise more savings, as well as providing more credit, and more advanced financial services. This will strengthen the financial position of MFI outlets and thus lead to geographical expansion and financial intensification in both rural and urban areas. In addition, governments should introduce fair

rules and regulations for the financial stability of MFIs (Moll, 2005). Micro-finance can have a positive impact on many economic and social factors if it is supported by governments. It can improve living standards, enhance status in society and in the education sector, improve health facilities, reduce the crime rate, raise income level, and generate employment opportunities by reducing poverty (Swope, 2010).

Given that the number of micro-finance borrowers is increasing but the impact of micro-finance is negative on economic growth, it is perhaps time for governments to concentrate fully on regulating private-sector micro-finance financial services and on providing efficient support and incentives as opposed to conducting its own initiatives. There is urgent need of adequate regulation, particularly because some of the micro-finance policies are unclear and inconsistent with the promotion of micro-finance. In addition, there is a need for governments to focus on professional moneylenders and lending investors. Assistance and incentives should be given to MFIs because they constitute the primary sources of micro-finance for ordinary households and small enterprises. Improvement in these operational services, therefore, should have a positive effect on the active borrowers they serve in terms of lower interest rates and increased credit services.

For the micro-finance sector to have a positive impact on economic growth, the macroeconomic environment, and particularly the formal financial sector of a country should be considered when assessing micro-finance sector performance. There should be a strong association between the micro-finance sector and the formal financial sector in the light of current evolution that micro-finance is progressively commercialising, while formal banks and investors are greatly interested in micro-finance markets.

The micro-finance industry must fully engage in some soul-searching to ensure that MFIs comply to high standards of borrowers' protection, and to educate the public about the core principles of fairly-delivered and easy micro-finance. To do this, it is essential to have a

positive regulatory authority. If MFIs anticipate all the internal and external issues and create standards for itself as well as a sound public understanding of best practice, it is highly likely that the micro-finance sector will see more development and bring prosperity to economies (Rhyne and Otero, 2006).

According to Moll (2005), given the importance of government policies regarding micro-finance stability and expansion, MFIs should be given support in two ways. First, governments must pass legislation that allows MFIs to mobilize savings, to provide credit, and to undertake other financial services, such as insurance and money transfers. These services result in economies of scale and scope, which enhance the financial position of micro-finance institution outlets, thus allowing geographical expansion and financial deepening in rural areas. Second, appropriate regulations are needed to underpin the financial stability of MFIs in their specific circumstances.

5.7 Future Research

Firstly, this study covers the impact of conventional micro-finance on long-run economic growth across the countries. This study can be extended by testing at various country levels and in specific regions of the world. By taking the micro-finance sectors of two or three countries, studies could also compare the performance of micro-finance in those countries. Secondly, the scope of the study can also be expended to test the impact of Islamic micro-finance on long-run economic growth and to compare it with conventional micro-finance. Fourthly, future studies could also examine the impact of conventional and Islamic micro-finance on poverty level across countries. Finally, there is also the potential for studies to test the impacts of micro-finance on short run economic growth and poverty across countries. All the impact assessment studies across the globe use cross sectional data to assess the impact of micro-finance (both conventional and Islamic) on economic growth and poverty. It would be interesting to use panel data to estimate the impact of micro-finance on poverty.

APPENDICES

This part of the study shows the figures of average growth rate of real per capita GDP versus the explanatory variables of the regression models. The figures show the partial correlation between the dependent variable (average growth rate real per capita GDP, gi) and the set of explanatory variables of this study.

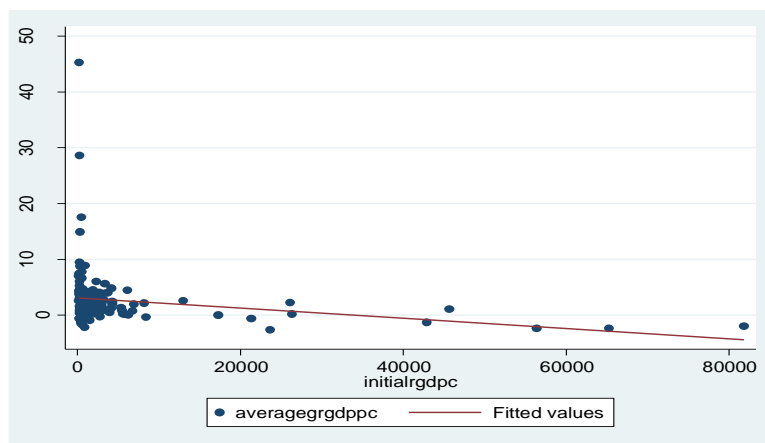**Figure 3: Average Growth Rate of Real Per Capita GDP versus Initial Real Per Capita GDP**

Figure 3 shows the partial relation between average growth rates of real per capita GDP and the starting/initial level of GDP. The horizontal axis plots the initial real per capita GDP from 1995-2013 for the observations included in the regressions model. The vertical y-axis shows the average growth rate of real per capita GDP. Thus, the figure displays a negative slop which shows the conditional convergence relation; that is, the effect of real per capita GDP on the growth rate for given values of the other explanatory variables.

Figure 4: Average Growth Rate of Real Per Capita GDP versus Initial Literacy Rate
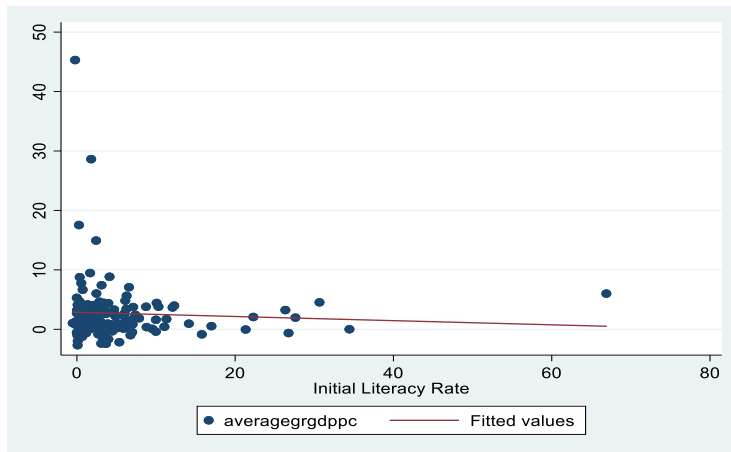

Figure 4. Average Growth rates versus initial literacy rates (partial relation). The diagram shows the partial relation between average growth rate of per capita GDP and the literacy rate. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of literacy rate, and the fitted line shows a negative correlation between literacy rates and growth rates.

Figure 5: Average Growth Rate of Real Per Capita GDP versus Initial Primary School Enrolment
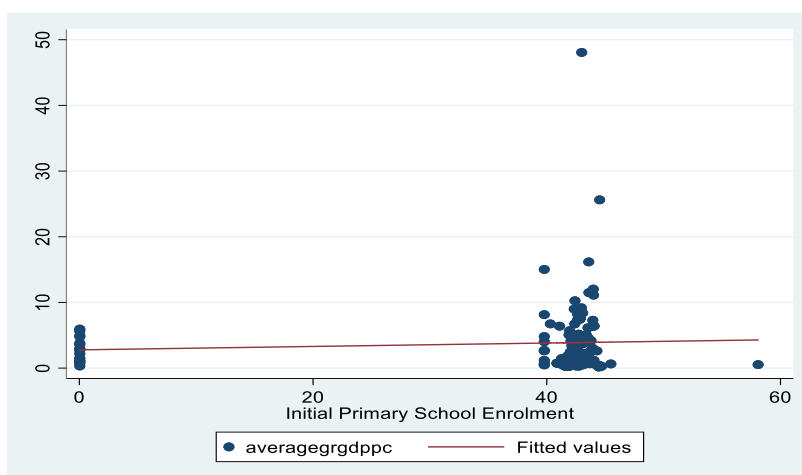
Figure 5. Average Growth rates versus initial primary school enrolment (partial relation). The diagram shows a positive and partial relation between growth rate of per capita

GDP and primary school enrolment. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of initial primary school enrolment, the trend line shows a positive relationship between the two variables.

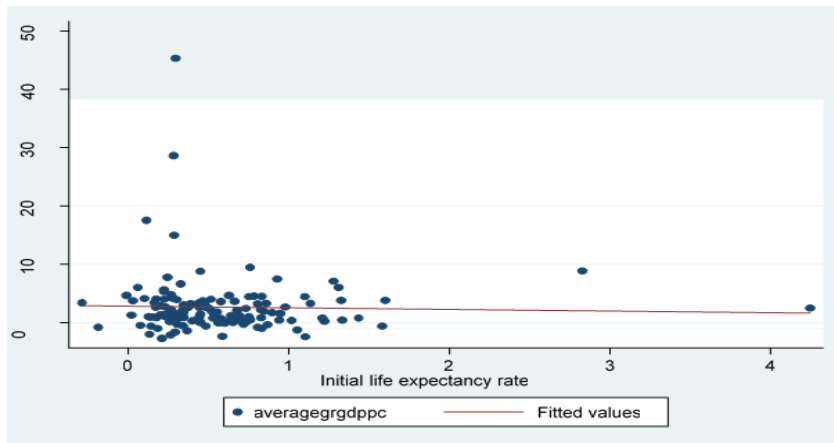**Figure 6: Average Growth Rate of Real Per Capita GDP versus Initial Life Expectancy**

Figure 6. Average Growth rates versus initial life expectancy (partial relation). The diagram shows the partial relation between average growth rate of per capita GDP and the initial life expectancy. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the initial values of life expectancy. The fitted line indicates a negative relationship between life expectancy and growth rates.

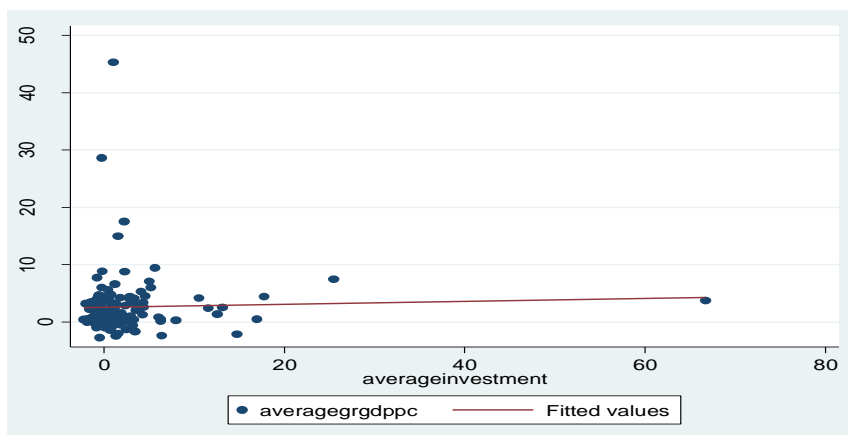**Figure 7: Average Growth Rate of Real Per Capita GDP versus Average Investment**

Figure 7. Average Growth rates versus average investment (partial relation). The diagram shows a positive and partial relation between average growth rate of per capita GDP and average investment. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of investment, the trend line shows a positive relationship between the two variables.

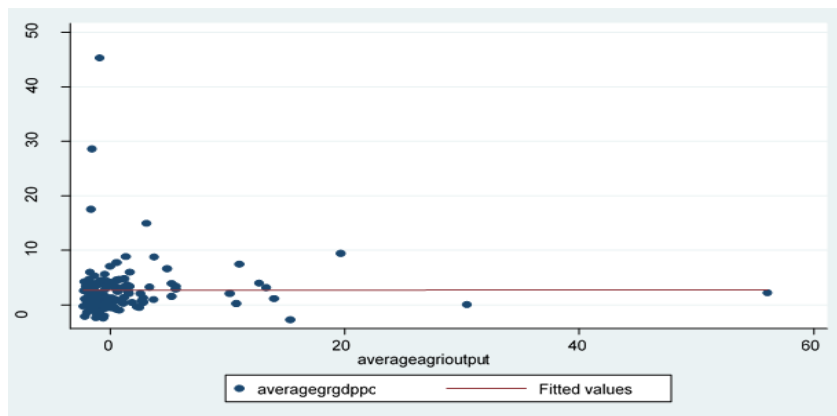**Figure 8: Average Growth Rate of Real Per Capita GDP versus Average Agriculture Output**

Figure 8. Average Growth rates versus average agriculture output rates (partial relation). The diagram shows the partial relation between the average growth rate of per capita GDP and the average agriculture output. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of agriculture output. The line shows a positive relationship between growth rates and agriculture output rates.

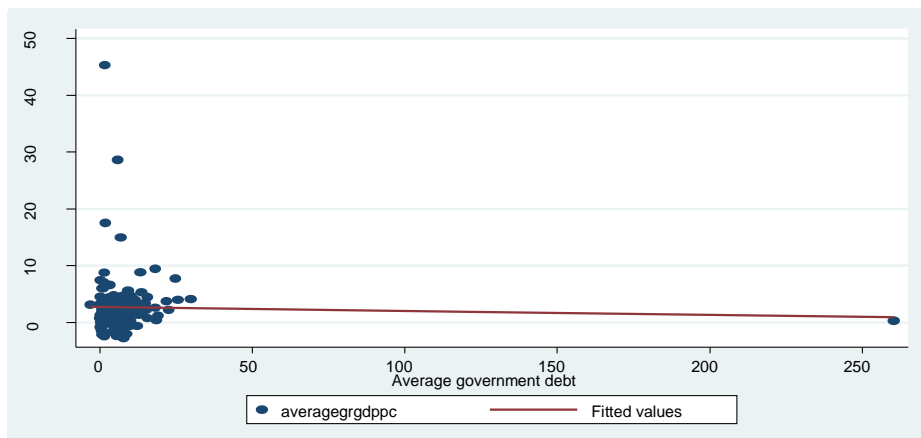**Figure 9: Average Growth Rate of Real Per Capita GDP versus Average Government Debt**

Figure 9. Average Growth rates versus average government/central debt (partial relation). The diagram shows a negative and partial relation between average growth rate of per capita GDP and the government debt. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of government debt.

Figure 10: Average Growth Rate of Real Per Capita GDP versus Average Liquid Liabilities
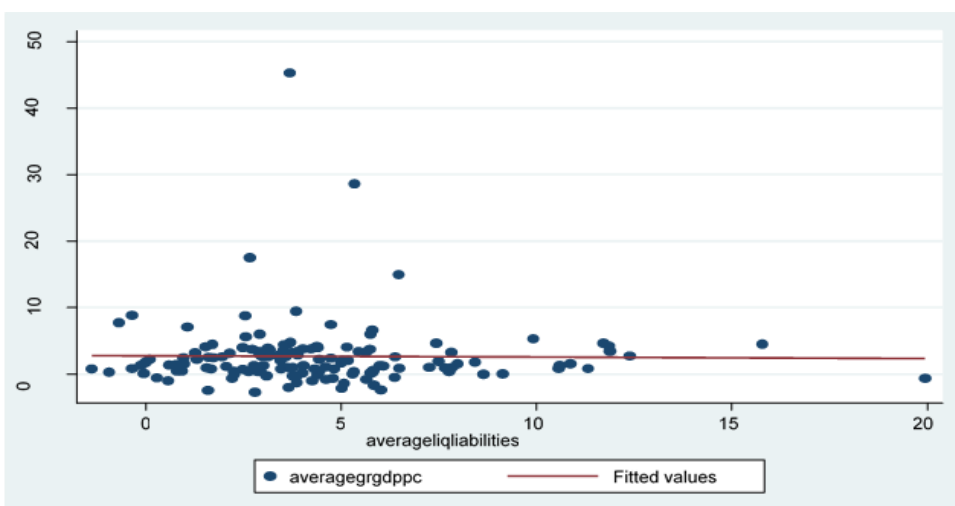

Figure 10. Average Growth rates versus average liquid liabilities (partial relation). The diagram shows the partial relation between growth rate of per capita GDP and the

average liquid liabilities. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of liquid liabilities. The fitted line shows a negative relationship between growth rates and liquid liabilities.

Figure 11: Average Growth Rate of Real Per Capita GDP versus Average Domestic Credit provides by financial sector
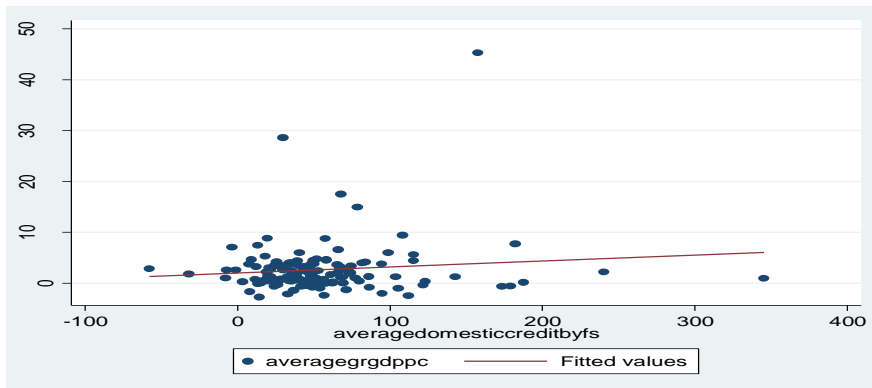

Figure 11.   Average Growth rates versus average Domestic credit provides by the financial sector (partial relation). The diagram shows the partial relation between growth rate of per capita GDP and the average domestic credit provides by the financial sector. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of domestic credit provides by the financial sector. The line shows a positive correlation between growth rates and domestic credit provides by the financial sector.

Figure 12: Average Growth Rate of Real Per Capita GDP versus Average number of Active Borrowers
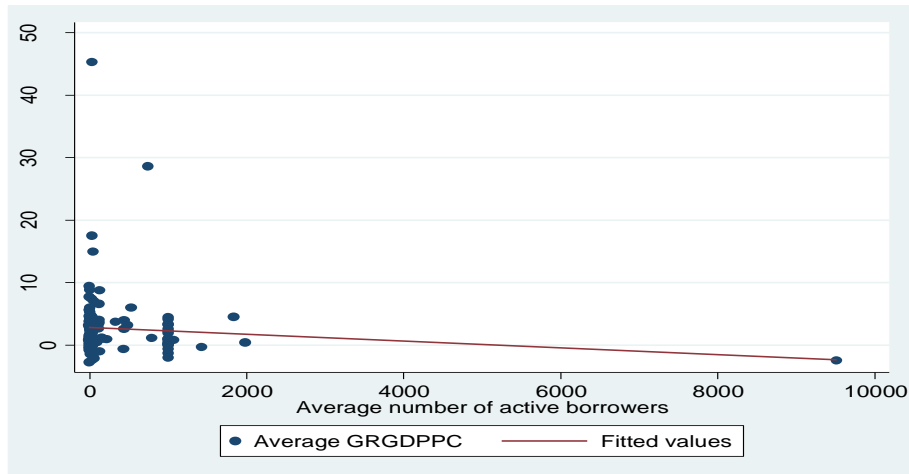

Figure 12. Average Growth rates versus average number of active borrowers (partial relation). The diagram shows the partial relation between growth rate of per capita GDP and the average number of active borrowers. The vertical axis plots the corresponding growth rate of real per capita GDP and the horizontal axis plots the values of active borrowers. The fitted line on the average values of the number of active borrowers and growth rates shows a negative relationship between them across the countries.

Figure 13: Average Growth Rate of Real Per Capita GDP versus Average Gross Loan Portfolio
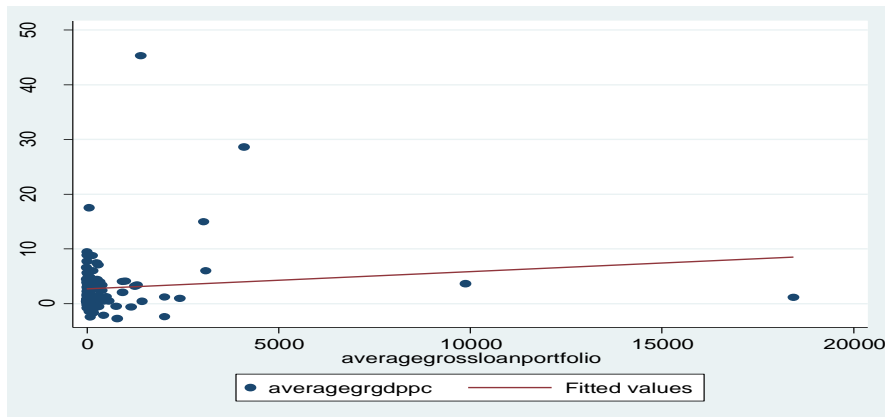

Figure 13. Average Growth rates versus average gross loan portfolio (partial relation). The diagram shows the partial relation between growth rate of per capita GDP and the average gross loan portfolio. The vertical axis plots the corresponding growth rate of real per capita GDP for and the horizontal axis plots the values of gross loan portfolio. The fitted line shows a positive trend in the correlation between growth rates and gross loan portfolio.

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