BACHELOR THESIS

Ellenor Lodenius


LUND UNIVERSITY

School of Economics and Management

# Does financial development imply economic growth?

NEKH01, Fall 2014

Department of Economics

Supervisors: Martin Strieborny and Lu Liu

## Abstract

A financial sector is needed for a country to allocate resources and store capital. The ways this sector can be organized vary greatly among countries in the world. In this thesis I will try to investigate if a country's financial system is beneficial for its economic growth. For testing this a static linear panel data model is used, and several regressions with different proxy variables are performed. My sample consists of 21 Asian countries and the proxy variables are measuring either stock market development, banking sector development or economic growth. The purpose of having numerous variables is that it allows for a more precise analysis of which part of the financial system that potentially generates economic growth. The results differ among the proxy variables, where for example the stock market variable *Turnover ratio* is significant while the others are not. The same situation arises for the banking sector variables. A few of them cannot be proven to be significant, while the main proxy variable, *Domestic credit to private sector by banks*, did enter the regression significantly. These results indicate that there do exist some sort of connection between financial development and economic growth, but that attention has to be paid to where in the financial system this relation comes from.

*Keywords:* Financial development, economic growth, Asian countries, static linear panel model

## Table of contents

## 1.0 Introduction

From a general point of view, the financial market is often seen as a place where investors turn to earn big money, a place with a high tempo and where everyone is eager to receive the highest profit. In addition, the financial sector works as a place for companies to find financiers and potentially expand their businesses. But what profit does the society as a whole gain for letting these activities take place? Does it help to develop a country, and if so, to what extent?

Today, a well functioning stock market is something that exists in almost all developed countries and could be seen as a natural component of any developed society. Also, it seems to be that a stock market only occurs if the country is enough developed, as if the stock market grows together with the entire nation. This potential relationship has been widely discussed in previous literature and people disagree whether these observed patterns are significantly reliable or not.

I have in this thesis chosen to focus on the southern and eastern part of Asia, since many countries in that area are opening up to the world and are developing quickly. Some of the sample countries have come much further than others in this development process, but it must still be noted that many of these major changes happened during the nineties for several of the sample countries. Thus, since some time has now passed, it might be possible to see what impact these transformations have caused.

I want to interrogate and see if finance, and all that comes with it, is beneficial for a regular citizen in one of the sample countries. More precisely, I will try to answer the question: Does financial development imply economic growth?

My hypothesis is that financial development does have an impact on economic growth, and that this impact is in fact quite big. This would in turn imply that a country could never fully develop if its financial sector does not. Furthermore, the hypothesis include the belief that finance does not only follow a country's growth pace, but is in fact be the first stage of the development process, spurring further economic growth.

To answer this question I have made 20 different regressions, combining five stock variables and four bank variables in different ways. I have done this in order to try to see which part of the financial market that potentially could cause economic growth. These variables are added to a static linear panel model with two-ways fixed effects.

The reason for dividing the financial sector into the stock market and the banking sector is because they are both important when allocating resources. According to economic theory, one of the most efficient ways for an economy to develop is to liberalize the financial sector. However, if this sector would only consist of banks this would lead to asymmetric information and not providing all agents with the best possibilities. To be able to maximize this market a stock market would have to be included. This is due to the fact that a stock market provides liquidity and work as a price determining mechanism. This in turn allows for agents with different interests to enter the market, knowing that they will receive the fairest prices and in a comparatively easy way find a counterpart for their desired affair (Caporale et al. 2004, p.36).

However, there is a difference between developing and developed countries in this aspect, namely that the banking sector plays a bigger and more important role in developing countries than in developed countries. Because, in a developing country the banks are the one place where agents turn for investment purposes. If there exists a stock market, it is often not very accessible and relatively expensive to enter. This leads to banks being the main actor in the financial sector (Seetanah et al. 2012).

My results in this thesis vary depending on what variables are included in the model. *Domestic credit to private sector by banks*, the main bank variable, is often significant in the regressions and therefore proven to influence growth. At the same time, two of my other bank proxy variables were not significant, which then indicate that the relationship between banking development and economic growth is not complete clear. Furthermore, *Turnover ratio*, one of the stock variables measuring the efficiency of the market, shows strong positive linkage with the economic growth variable. Yet, two other central stock market indicators, namely *Market capitalization* and *Value traded*, could not be proven to be significant and therefore could not be concluded to have any impact in the model.

In addition, I have added a section about *Stock market volatility*. The reason for this is that increased volatility is believed to follow from a liberalization of a country and is one of the main arguments as to why movements towards the global markets could harm a country. On the contrary, Bekaert et al. (2006) have found that this is not necessarily the case. In my thesis I have included a discussion about the importance of openness and integration with the world and therefore wanted to test if Volatility entered the regression with a positive or negative sign for the countries in my sample.

To emphasize the importance on the degree of openness in a country, interaction terms with Total flows and stock or bank variables are included in the analysis. There, Market capitalization and Value traded enter the regression significantly, both as independent variables and as interaction variables together with Total flows. Thus, this display that these two variables might indeed have an impact, though only together with increased openness.

The paper is divided into several sections, starting with a literature review. That is followed by the method and model section and later a data segment. Finally, I will present my findings and results, and discuss the implications of these in relation to my research question.

## 2.0 Literature review

Research and literature on economic growth can be dated back over a century. A famous work is one written by Schumpeter (1912) who discusses the concept of economic development. He states that there are changes in a country that are decided upon and then implemented in the society, but that does not count as economic development. For a change to be classified as development it has to arise by itself, in a natural and unforced way. According to Schumpeter there are continuous flows and movements in the world and a movement towards some sort of equilibrium, but development is something different and not part of this flow (p.64). Moreover, to relate these thoughts to the issues of development that will be discussed in this thesis, namely banking and stock market development, Schumpeter mentions the fact that bankers allow for innovation by having the power to decide on who receives funding for their new ideas. This is then an example of development, if no government is involved in the process. Where the banker is a new authority, created naturally by a need in the society.

Regarding the research of financial development and economic growth many research papers have been published over the years and the regression methods have been both developed and improved. However, the results of the many research papers are not coherent, and sometimes vary tremendously. Levine and Zervos (1998) argue to have found strong and robust evidence that financial development affect economic growth in a positive way. Then there are the ones, for example Seetanah et al. (2012), who have found some linkage, but much weaker ones. A third opinion is that financial development does not help a country's growth at all, but only follow the rest of the economy. Seen from this perspective, the financial sector creates what is needed in the market, but does not function as the first place where change and growth take place. Robinson (1952) is a well-cited name that disagrees with the idea that financial development should have any major impact on the growth of a country. At least the author does not believe the growth process to begin with finance. Instead she argue that it is in the enterprises and the business sector where growth and economic changes origin. A known quote is "… it seems to be the case that where enterprise leads finance follows." (Robinson, 1952, p.86)

### 2.1 Choice of topic

There are several reasons to why I chose this topic. Except for personal ones, such as my interest in Asia and the financial world, people seem to believe that there is a lot of potential in those markets and a change of great earnings that they want to take part of. Moreover, I find these questions very relevant today when plenty of things are happening and have happened over the last thirty years in this region regarding both the countries' domestic financial markets and their integration with the global market. Therefore, my sample consists of 21 Asian countries, namely Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Myanmar, Nepal, Philippines, Singapore, Sri Lanka, Vietnam, Thailand, Macao, Mongolia, Kazakhstan, Lao PDR, and Bhutan. Even though many before me have tested for these relationships, more than one author mentions that there still lacks enough empirical results for a complete picture, therefore it feels necessary to provide this field of research with more and newer findings.

In addition, as already discussed, researchers disagree concerning the impact finance has on a society and the opinions differ regarding which comes first - financial development or economic growth. With the immense focus there is on Asia I thought it would be interesting, with improved variables and some years of research behind me, to test for financial

development and if the countries profit from it. Furthermore, a crucial point is that this financial development, usually together with an opening of the country, does in fact benefit the country and its inhabitants and not only the foreign investors and other parts of the world.

Furthermore, one can choose different angles when looking at economic growth. Some want to know whether it is the financial sector that causes economic growth or if it is the other way around. Therefore they have looked and tested for causal links. Biswas (2008) is one of the papers that discuss this matter. The author uses a sample of twelve Asian countries, both developed and developing and also divide the financial sector into banking and stock market to get a more precise picture of the market. His results are not the same for the entire sample, but for some countries he finds a reversed causality in comparison to the one that I try to measure in this thesis, namely that for some of his countries it seems to be finance that follows economic growth. However, in this thesis I have chosen to have a one-way approach and investigate if financial development implies economic growth and not the other way around. This is due to the fact that I want to focus on the question if financial development has an impact on economic growth and deepen that analysis further by working with several proxy variables.

In the next section of this paper I will mention a few research papers that have made important contribution to this field of research and have provided me with inspiration for this thesis. Moreover, I will discuss a few aspects of this topic that are extra important and where research only on those specific aspects and economic growth has developed. All the papers that will be presented have found interesting results that are related to some extent with what is tested for in this thesis, but of course differ in aspects such as method, variables and sample countries.

## 2.2 Background

### *2.2.1Positive earlier research*

Indeed, earlier research has found that financial development helps to increase the economic growth in a country. There are several different reasons for this. First, a financial sector helps allocating resources more efficiently, mobilize savings and allows for long-term investments (Levine, 1996, p.6). Moreover, financial sectors can be positive for technological innovation. This is because of its ability to find promising companies to invest in and therefore gives the

company a bigger opportunity to reach out to society with their product. Also, investors with different interests can turn to the financial sector and make the affairs they are searching for.

Secondly, these markets can reduce numerous costs associated with the financial surroundings. More specifically, they help reducing transaction costs by allowing a higher number of and more accessible counterparts. Moreover, the information and monitoring cost is smaller since it is easier to learn and understand what options and possibilities there are on the market. This reduces imperfect information, meaning that a larger group of people get a fair change of receiving accurate information and the same facts as insiders on the market. All these properties create a great amount of liquidity and reduce risk (Cihák et al. 2012).

For a financial sector to be efficient, it should not only consist of banks. For example, if a company wants to find capital for their next big project or start up idea it might be very hard to receive a loan from the bank. This due to the fact that the bank might have troubles creating a risk profile and understand what level of risk this company has. Instead, the company can turn to the equity market to find funding, an opportunity that would be impossible if there only exists banks on the market. This situation is mentioned by Caporale et al. (2004, p.36) that state that one of the main advantages with the stock market is this ability to facilitate trading with all levels of risk, adjust prices and spread risk among all participating agents.

An example of a research paper where they found a positive relation between finance and economic growth is Levine and Zervos (1998). They did a cross-country regression with 47 countries between the years 1976 to 1993. The authors found that there exists a positive relationship among banking development and stock market liquidity on one side and current and future economic growth rate on the other. They chose to use the framework by Robert J Barro (1991), described in his paper "Economic growth in a cross section of countries". Levine and Zervos' variables are divided into three groups where each one represents a different aspect of financial development or economic growth. One division as you see in almost all papers regarding these topics is that there are some variables that proxy for the banking sector and a few others that proxy for the stock market. The exact indicators that are used vary, but some seem to have been used almost always. In this paper, they have chosen to use Market capitalization, Turnover ratio and Value traded as their stock market indicators. In addition, they have also added a volatility measure and an international integration measure. As for their bank sector variable they use the value of loans from commercial banks and other

deposit-taking banks to the private sector divided by GDP. Finally, they have numerous growth indicators as an attempt to capture different types of economic growth. These indicators are, except for the usual real per capita GDP growth, real per capita physical capital stock growth and all other types of growth, which they call productivity growth.

Their purpose is to investigate if there exists any partial correlation between the different growth variables and the stock and banking variables. Thus, they ran 16 regressions and both their stock market and banking development indicators enter the regressions significantly at a five percent level. These results stay consistent when adding control variables, such as Secondary school enrolment and Inflation, meaning that the results imply that banking and stock market development helps economic growth. Furthermore, the estimated coefficients suggest that this relationship is substantial for all growth indicators.

When comparing my study to this paper by Levine and Zervos, there are some similarities. Several of the variables are the same as the ones I have used, and I have also performed numerous regressions to test for different characteristics in the market. As described more in detail in the method section, what I have done differently is that I have worked with a panel data set to get a more accurate and dynamic picture of reality. Furthermore, I have added a few more variables to see if they give any significant results. Another thing that differ is that instead of looking at several growth indicators I have chosen to discuss the impact that the stock and banking variables have on the main growth indicator, namely real per capita GDP growth.

Another paper that shows evidence of a positive linkage is one written by Levine (1996). He states that this linkage is of great importance and that the understanding of the mechanisms behind a country's financial development is fundamental to be able to understand the features of the country's economic growth. Nevertheless, he mentions that even though he believe financial development to be of great importance, other factors does influence as well. Two of these factors can be technological improvements and how well the legal system is working.

Arestis et al. (2001) have published a paper with similar results. They performed a time-series analysis with five developed countries and also find that there is a linkage between financial development and economic growth. As many other papers, they divided the financial sector into banking and stock market and found that for their countries banks seemed to have a much

greater impact on growth in comparison with the stock market. In comparison to my study, these results are very interesting since they confirm the existence of a relationship between financial development and economic growth. At the same time their countries, namely Germany, United States, Japan, United Kingdom, and France, are all developed countries and pretty different from the ones I have worked with in my thesis. Except for Japan that is included in my study as well. Furthermore, Seetanah et al. (2012) performed a panel data study with least developed countries where the authors also found that banking were of higher importance for a country's development than the stock market. They even found the relationship between stock market development and economic growth to be in general insignificant (p. 14). Even though these papers differ from my thesis, their finding that the importance of the stock market versus the banking sector might vary is interesting and something that I also will investigate.

### *2.2.2 Negative earlier research*

Nevertheless, some negative effects can accompany the stock market as well. Depending on how developed the country is, a more liquid and volatile market will have different impact. If the country is not prepared and strong enough for an equity market the economy will become more uncertain and money can easily be lost. In Levine (1996, p. 11) a couple of different arguments are proposed for why increased liquidity will not lead to economic growth. For example, savings rates might change and reduce due to substitution and income effects. Moreover, investors will not be as dedicated and can more quickly change their investment strategy. Thus, they do not make the best decision for the companies they initially invested in. Hence, corporate governance will be more dispersed and uncertain.

Furthermore, a financial system can be formed in a wide array of ways and one influential factor is what kind of countries we examine. A usual comparison is between developed and developing countries, where, for example Seetanah, et al. (2008) says that the banking sector plays a much larger role for the latter group. This is due to the fact that, if an equity market exists, it is usually not very accessible and do not have sufficient instruments to provide capital to uncertain counterparts. An inefficient and excluding equity and bank sector is characterised by loans and credit only reaching the already wealthy part of the population. The financial institutions do not have the resources to fully examine the "unknown" agents' risk profile and investigate their default probability. This leads to unrealistically high interest rates that are hard to implement and use in reality (McKinnon 1973). Depending on other

macroeconomic factors these patterns become more or less severe. For example a volatile and high inflation causes uncertainty in the market and makes it hard for banks to decide upon a good interest rate.

### *2.2.3 Integration and liberalization*

One specific feature that might have influenced and still is influencing all the countries in my sample, and other parts of the world, is the countries' financial openness. This refers to at what point and to what extent they let foreign investors affect their economy. This question is today very interesting, especially in the Asian area, since many investors have their eyes on these countries as they have seen them opening up and allowing for growth and progress. Thus, a given foreign investor could see a great opportunity to improve and make their business more efficient. A few of the Asian countries are pretty well developed and are as open as any other developed countries; Japan and Hong Kong are examples of such. Others have opened up pretty recently and still have some time left before they reach the level of financial efficiency and depth that you experience in a developed country. Moreover, it is not yet certain exactly what effect these changes will generate and whom it will benefit. This makes it very important to include some sort of financial openness measure in the regression of my thesis, simply because it has a huge effect on these countries and it is something that differs widely among them.

A usual step when developing a country's financial market is to open up for foreign investors. Kose, et al. (2006) discusses the effect of financial openness and mention a threshold where countries are either above or below it. They argue that countries that are below this level would not benefit from introducing an equity market in their society. The conditions which decide on what side the country is located are different measures on how well developed the country is, for example in terms of governance policies, institutional quality and domestic financial market development. Furthermore, they argue that if you are above the thresholds you often experience an increase in GDP and a decrease in market volatility. If you instead were located below the thresholds you would be likely to have higher market volatility and a GDP that could move in both directions. Ito (2006) is another author who elaborates upon these thresholds. His empirical results shows that a country do profit from liberalizing their market, but only if they have a certain level of economic and legal development, i.e. that the country is above a threshold level (p. 305). Moreover, the author find that for emerging Asian countries it is indeed the development of the institutional and legal system that help them gain

from financial liberalization and to develop (p. 315). He also highlight the fact that it seems as if the overall legal system is more important then the financial legal environment for a country's development.

Bekaert, et al. (2005) show that they have very robust results regarding the influence financial openness has on a country. Their findings show that higher equity market liberalization gives about a one percent increase in annual real per capita GDP growth. However, they consider this increase to be extraordinary and believe that it is probably accompanied with other macroeconomic changes and an overall financial development (p.41). Another discovery is the differences between completely open countries and segmented countries, where they find that the non-liberalized countries have lower life expectancy and lower secondary school enrolment (p.15).

A country can experience different kinds of integration. There is the economic integration where trade barriers are lowered and regulations concerning trade with foreign countries are eased. Then there is the financial integration where foreign investors receive access to domestic capital markets. Thus, when the market is fully integrated these foreign investors should be able to enter it without any restrictions (Bekaert and Harvey, 2002). Chinn and Ito (2006 p.165), among others believe that for financial integration to happen, a country first needs the economic integration to take place.

Bekeart and Harvey (2003, p.4) describe an integrated market as a market where assets with the same risk has the same expected return independently of the origin of these assets. However, financial openness seems to be of limited character, owing to home bias, the feature that leads to that full integration is very unlikely to happen. Home bias is defined as the willingness in people to invest in domestic markets even though foreign investment possibilities exist. It might even be so that industrialized countries are not completely integrated and perhaps never will be.

Additionally, a difference that should be highlighted is the one between integration and liberalization. A country can liberalize their markets, but still not be integrated with the world because of poor liberalization techniques and unsatisfactory results. If the liberalization seems unstable and not very long lasting foreign investors might choose not to invest even though they are presented with the opportunity. A field of studies have arisen with purpose to date

when these integrations happened. This could be of interest in order to compute tests that try to see how the countries reacted to different changes in openness policies. Several papers such as Bekaert, et al. (2002), and also Bekaert and Harvey (2003), have tried to understand exactly when countries did become liberalized by performing structural break analysis to investigate how capital flows influence the price level in a country. In the paper they acknowledges the fact that capital flows seems to increase a couple of years after the liberalization, but that it then evens out as investors have rebalanced their portfolios (Bekaert, et al. 2002, p. 297).

Stiglitz (2000) is one paper that put forward arguments as to why financial integration is something negative for a country's growth. He states that market integration does not lead to a higher investment rate. As an example he mentions China, a country that has been exceptionally good at attracting foreign capital, without eliminating their restrictions on short-term capital flows. Moreover, Stiglitz talks about stability and that financial crisis has a damaging impact on economic growth, which then is an argument to why one should be cautious when dealing with foreign capital flows and perhaps not simply open up a country's capital markets and believe that economic growth will follow. Especially, a wider liberalization can be extra damaging when the country is not prepared and lack a sufficient political and legal system to deal with these types of capital flows. Yu, et al. (2010) point out that such liberalization means that other countries' problems and instability can affect your country harder and more rapidly, which in turn leads to an even bigger need of monitoring ability.

### *2.2.4 Legal system*

Furthermore, the legal system also affects economic growth. It decides on what type of transactions that are allowed and how the financial sector should function. The law decides how protected the investors and managers are, and thus works as an indicator of relative power between the state and property owners. As one might guess this should have huge influence on the financial environment in a country and this has indeed been argued for in literature. La Porta, et al. (1999) says that the protection of shareholders and investors is of great importance and that it is probably one of the big reasons to why investors invest more in some countries than in others. Because without any protection financiers may become victims of expropriation and invest in projects and companies where the insiders only see to

themselves and by different means ignore trying to repay the capital that the investors contributed with.

When discussing the law one normally mention the functioning of the government and the degree of corruption in the country. These issues are closely related, for example since a highly corrupt society most likely does not have a satisfactory and fair legal system. As previously mentioned a country can be more or less suited for opening up to the world and one important aspect in this is how its legal system works, both for the country to attract foreign investors, but also to create a lasting and stable economic growth. Chinn and Ito (2006) discuss and test for these matters. They conclude that for a country to benefit from opening up they need to have a sufficient existing legal system in beforehand that knows how to deal with these types of management and risk questions. This is especially important for emerging and developing markets. The better the legal system is, the more good will a financial opening of an emerging market do and the risk of harming the nation decreases (p.165). As mentioned before, one of the most important legal aspects seem to be to what extent the shareholders are protected. Furthermore, the authors mention that there is a difference among which legal system one is referring to. In their research they found that the overall legal system had a greater impact then the financial legal system.

### *2.2.5 Situation in Asia*

If we focus on Asia, many of the Asian countries have experienced a remarkable change since around the 1990's. More than doubled market capitalization and an overall improved financial market are just a few of the things that have led to that these countries today have a much different role in the world economy compared to before. Still, they have a bit left until they reach the levels of industrialized countries (Purfield, et al. 2006 p.4).

One main factor to these changes is the fact that the countries opened up to the rest of the world. More specifically they have, to a different extent, allowed for foreign investors to act in their markets and also made an effort to improve and form the financial environment to better fit the global market. For Asia, both good and bad things have come out of this. They do have experienced a higher expected return in their markets and great growth and development. But there are two sides of every coin and with higher expected returns come higher risks and volatility. An illustration of this volatility is the Asian crisis in 1997 that begun in Thailand and a devaluation of the Thai currency when the Thai government decided

that they were forced to leave their fixed exchange rate. This then affected other parts of Asia and several financial institutions in neighbouring countries collapsed and IMF (International Monetary Fund) had to assist with rescue packages (Li, 2012 p.426).

On the contrary, Bekaert and Harvey (2002, p. 434-435) found that more integration with other parts of the world does not have to be accompanied by increased volatility. The same applies to higher correlation with the world after liberalization, if the country in question has a much different economic and industrial structure compared to the markets it is integrating with, there does not have to be any considerable changes in correlation. Still, the correlation does usually increase. In their paper they did not only include Asian countries, but looked at developing countries situated all over the world. Nevertheless, it is an interesting result to keep in mind.

Furthermore, Bekaert, et al. (2006) uses cross-section data to investigate if consumption growth volatility changes after financial liberalization. They reject the hypothesis that financial integration causes significantly higher volatility (p. 385). This seems to hold for all types of countries, including emerging markets, which is of specific interest for this thesis, where they have found that an opening of an emerging market does not result in a significant difference in consumption growth volatility. This is a remarkable result since many argue that one of the main negative effects of opening up a country is the increased volatility.

When looking at Asia it does not seem fully clear to what extent the countries are integrated. Yu, et al. (2010) discuss the results of Kim et al. (2006) and Jeon et al. (2006) who both say that it appears as if the Asian markets become more and more integrated with the global market rather then with each other. Indeed, also their own analysis indicates that the Asian countries are weakly integrated. For this area this integration is important for the economic development, and also a challenge. The starting economic conditions vary among the countries and so does their legal policies. To perform an integration process in a sustainable way for everyone is difficult, but if done properly, it will perhaps benefit the countries and help them grow.

### *2.2.6 Variables*

As for the variable decision Cihák, et al. (2012) present four features of the financial sector, namely financial depth, access, efficiency and stability. These characteristics are then used to

create a 4x2 matrix, where the other two characteristics are a division of the financial sector into financial markets on one side and the financial institutions (mainly banks) on the other side. This is an attempt to capture and describe a more extensive picture of the ways a financial market can be influenced from. Yet, the authors acknowledge the fact that they do not describe an entirely complete picture, and that they are aware that there are other aspects one could add to the analysis.

| | FINANCIAL INSTITUTIONS | FINANCIAL MARKETS |
|---|---|---|
| DEPTH | **Private sector credit to GDP**<br>Financial institutions' assets to GDP<br>M2 to GDP<br>Deposits to GDP<br>Gross value-added of the financial sector to GDP | **Stock market capitalization plus outstanding domestic private debt securities to GDP**<br>Private debt securities to GDP<br>Public debt securities to GDP<br>International debt securities to GDP<br>Stock market capitalization to GDP<br>Stocks traded to GDP |
| ACCESS | **Accounts per thousand adults** (commercial banks)<br>Branches per 100,000 adults (commercial banks)<br>% of people with a bank account<br>% of firms with line of credit (all firms)<br>% of firms with line of credit (small firms) | **Percent of market capitalization outside of top 10 largest companies**<br>Percent of value traded outside of top 10 traded companies<br>Government bond yields (3 month and 10 years)<br>Ratio of domestic to total debt securities<br>Ratio of private to total debt securities (domestic)<br>Ratio of new corporate bond issues to GDP |
| EFFICIENCY | **Net interest margin**<br>Lending-deposits spread<br>Non-interest income to total income<br>Overhead costs (% of total assets)<br>Profitability (return on assets, return on equity)<br>Boone indicator (or Herfindahl or H-statistics) | **Turnover ratio** (turnover/capitalization) for stock market<br>Price synchronicity (co-movement)<br>Private information trading<br>Price impact<br>Liquidity/transaction costs<br>Quoted bid-ask spread for government bonds<br>Turnover of bonds (private, public) on securities exchange<br>Settlement efficiency |
| STABILITY | **Z-score** (or distance to default)<br>capital adequacy ratios<br>asset quality ratios<br>liquidity ratios<br>other (net foreign exchange position to capital etc) | **Volatility** (standard deviation / average) of stock price index, sovereign bond index<br>Skewness of the index (stock price, sovereign bond)<br>Vulnerability to earnings manipulation<br>Price/earnings ratio<br>Duration<br>Ratio of short-term to total bonds (domestic, int'l)<br>Correlation with major bond returns (German, US) |

Source: Cihák, Demirgüç-Kunt, Feyen, Levine (2012)

A few of the variables that are presented in this matrix are used in many other papers as well, and some of them are used in my analysis. A more detailed discussion about my chosen variables can be found in the method section below. Nevertheless, this matrix gives a good idea of what kind of angles one can look at in an attempt to describe a financial system. More or less the same sections can be found in other works. Mohtadi and Agarwal (no year) present a similar, yet not as precise and detailed, list of variables that proxy for stock market development. They also use Turnover ratio, Market capitalization and Value traded, but instead of applying them separately into the growth regression they first construct a model

with the three stock market variables as explanatory variables and creates an investment variable as the dependent variable. Afterwards, they put this investment variable into the growth regression as an explanatory variable, together with other variables that proxy for growth, and use this as their single proxy for stock market development. This differ from my work since I treat all variables separately in an attempt to get a better picture of where in the financial market this potential relationship between financial development and economic growth origins.

## 3.0 Model and method

There are several ways to approach and test for these types of relationships, but in an attempt to obtain the most accurate picture and include as many dimensions and observations as possible I have chosen to work with a panel data set. It produces more accurate results and is the most efficient estimator if one looks at the same individuals/countries over numerous periods (Verbeek, 2012, p. 374). More precisely, I have used a static linear panel model, which is described in more detail below. For this model I have 9 different variables that all try to describe a certain characteristic of the banking sector or the stock market. With these variables I have made 20 different regressions to see which one of these characteristics that are significant for the countries in my sample. My decision to work this way is because it gives you the opportunity to investigate not only if financial development spurs economic growth, but also try to understand more precisely from where this potential financial development comes from. Levine and Zervos (1998) is one earlier research paper that has a similar approach regarding the way they divide the proxy variables. A further description of that paper can be found in the literature review.

### 3.1 Equation

My regression model is a panel least squares model and is specified as follows

$$Y_{it} = \alpha_t + \alpha_i + \beta_1 X_{it} + \beta_2 Z_{it} + u_{it}\,,\ u_{it} \sim IID\ (0, \sigma_u^2)$$

Variable $X_{it}$ is the common variable for all the banking variables. It will differ every time I change the bank proxy variable. Such that, $X_{it}$ will be either Domestic credit to private sector, Banks overhead costs or Banks nonperforming loans. In the same way does $Z_{it}$ work as the

common variable for the stock market proxy variables, such that $Z_{it}$ will be Turnover ratio, Value traded or Market Capitalization. I have then run regression with each one of these variables in all different formations resulting in a total of 20 equations. $u_{it}$ is the error term and $\alpha_i$ and $\alpha_t$ the constants. $Y_{it}$ is the dependent economic growth variable, namely GDP per capita growth.

The model is a static linear model with panel data, therefore the subscript *it* is added to capture the cross-country and time dimension respectively. In this model the coefficients $\beta_1$ and $\beta_2$ are identical over time and for each country. Furthermore, I have chosen to work with two ways fixed effects, which means that the coefficient $\alpha_i$ is country specific and $\alpha_t$ the time fixed effect. Thus, the general intercept term $\beta_0$ is excluded from the model and replaced by this $\alpha_i$ that takes on different values for different individuals, but does not change over time. This is a way of dealing with potential correlation between the explanatory variables and the unobserved heterogeneity in $\alpha_i$ (Verbeek, 2012 p. 374). Furthermore, I have also added a time specific coefficient, $\alpha_t$, which control for business cycles and such.

The option of working with fixed effects arises from the fact that the country specific characteristics are of interest, and since it is typically used when dealing with countries or large cooperation's (Verbeek, 2012, p. 384).

To this model the same set of control variables are added to control for other important aspects of the question that is not captured in the explanatory variables. Each one of them is described in further detail below.

Government consumption expenditure is the only variable that is not in percentage, and in order to transform it into the same form as the other variables it was changed into logarithm form. Thus, it can also be interpreted in percentage (Verbeek, 2012, p. 58-62). In general, when evaluating the results from this model, these should be analysed as change in percent and not in absolute values.

As for the interaction model it is constructed as follows

$$Y_{it} = \alpha_t + \alpha_i + \beta_1 X_{it} + \beta_2 Z_{it} + \beta_3 WTotalFlows_{it} + u_{it}$$

The variables are defined in the same way as in the previous model. The difference is the last added variable. It consists of the variable W that is either a stock market proxy variable or a banking sector proxy variable. W is then multiplied with Total Flows (Export + Import) to see if they together affect economic growth. If we consider what kind of openness measure Total flows is, it would be a trade openness measure. Since we are dealing with financial development one would perhaps include a financial openness measure instead. But Total flows is in one sense a broader measure and take into account larger parts of the total economic environment. Therefore, one might be able to find some interesting results from using it in an interaction term.

When dealing with more than one equation the data can be differently fitted for different equations. For interpretation reasons one turn to the R2 measure that describes how many percent of the relationship that is explained by the included variables (Verbeek, 2012, p. 20-22). I have performed many regressions to include all the R2 values, but in general the R2 is around 60 percent for the first model. As for the interaction models it is the same or sometimes slightly higher at around 70 percent. This means that the data is equally good fitted in the interaction model as in the normal model, and also sometimes even better fitted.

### 3.2 Choice of variables

One also has to give a definition of the somewhat broad and vague concept of financial development and economic growth. The way I have decided to interpret these expressions is pretty straightforward, but does not fully capture all the aspects one could associate with them. Financial development is divided into two parts, namely stock market development and bank sector development. The reason for doing so is that they are believed to play very different roles, but at the same time both seem to be needed for a lasting and deep economic growth. For example, Caporale et al. (2004 p.36) highlight the fact that banks alone cannot efficiently allocate resources and do not lend money to risky counterparts. This calls for the development of the stock market, and not until that market is well functioning there can be efficient allocation of capital and a financial system that can handle risky investments and find funds to high-risk projects.

As for emerging markets banking seems to play a larger and more important role, at least in an early stage, and since many of my countries are developing markets it feels like this

division of financial development into stock market and banking sector seems appropriate to fully understand and capture in what ways and trough which channels finance potentially helps a country to grow. Furthermore, this separation of the financial sector is not rare, but implemented in numerous studies before. For instance, Creane, et al. (2007, p.486) chose to separate these two parts of the financial world. Their argument is that stock markets and banks are different parts of finance and have dissimilar impact on a country's development. At the same time, they do not include the same proxy variable as I have in these two parts. I look at stock market variables; while they divide it further into stock market, housing finance, interbank transactions etc. Overall, they have performed a quite different study in comparison to mine where they use a questionnaire as their research method.

## 4.0 Data

As for the appropriate variables it seems as if the most suitable ones have developed over the years and some are, as mentioned above, almost constantly used. Nevertheless, there is still a bit of variation, especially when it comes to how one combines them and chooses to implement and treat them. A list of my set of variables is presented in Table 1.

| Variable | Year | Source |
|---|---|---|
| GDP per capita growth | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Turnover ratio | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Value traded | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Market capitalization | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| (Volatility) | 1985-2011 | Global Financial Development Database, World Bank http://data.worldbank.org/ |
| (Market capitalization of ten largest comp) | 1985-2011 | Global Financial Development Database, World Bank http://data.worldbank.org/ |
| Domestic credit to domestic sector | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Banks overhead costs | 1985-2011 | Global Financial Development Database, World Bank http://data.worldbank.org/ |
| Banks | 1985-2011 | Global Financial Development Database, |

| | | |
|---|---|---|
| nonperforming loans | | World Bank http://data.worldbank.org/ |
| (Z-score) | 1985-2011 | Global Financial Development Database, World Bank http://data.worldbank.org/ |
| Secondary school enrolment | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Inflation | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Gross domestic savings | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |
| Government expenditure | 1985-2011 | International Financial Statistics, International Monetary Fund http://www.imf.org/external/data.htm#data |
| Total flows (import + export) | 1985-2011 | World Development Indicators, World Bank http://data.worldbank.org/ |

Table 1

A more detailed description of my variables will now follow, where they are divided into three different groups, namely economic growth, stock market and bank sector.

### 4.1 Economic growth

GDP per capita growth: *Annual percentage growth rate of GDP per capita based on constant local currency*. As for the economic growth I have simply chosen real per capita GDP growth rate as my dependent variable, since GDP is the measure commonly used to proxy for growth.

### 4.2 Stock market

Market Capitalization: *The value of listed domestic shares on domestic exchanges divided by GDP.* Market capitalization is a size measure aiming to interpret how big the market is. Even though the size is not all it is still normally included in the regression for capturing the development and growth of the market.

(Market Capitalization excluding top ten biggest companies): *Market capitalization excluding top 10 companies to total market capitalization.* This is an access measure to see how segmented the market is. If this number is much lower than Market capitalization it means that the market is concentrated to the biggest actors, which indicates that this potentially large

market does not reach the whole society. I have chosen to include this variable in my analysis even though there is a lot of missing data. This is due to the fact that it is an interesting aspect to look at, but if its result is insignificant it can be caused to some extent by the small data coverage. This is something that I discuss further in the limitation section.

Turnover ratio: *The value of the trades of domestic shares on domestic exchanges divided by the value of listed domestic shares.* This is a liquidity measure and is needed because a market might be large, but that does not automatically mean that it is efficient or active and therefore liquidity measures are in order. A high turnover ratio means that there are low transactions costs on the market, which in turn means that the market is more liquid. This variable has indeed increased tremendously since the nineties in the Asian markets (Purfield, et al. 2006, p.4) and therefore feels extra interesting to include in order to see if these changes have had any impact.

Value traded: *The value of the trades of domestic shares on domestic exchanges divided by GDP.* This is also a liquidity measure, but in contrast to Turnover ratio that measures trading relative to the size of the stock market, Value Traded captures the trading relative to the size of the entire economy. Thus, if a market has a low Value traded and a high Turnover ratio, that market is liquid, but small. Additionally, there is an issue with Value Traded. If the market have high and positive expectation for the future the stock price will rise today leading to that the value of trades also rises without any actual change in the number of traded shares. This means that the variable Value Traded can increase even though the liquidity does not. The same stands for Market Capitalization. But this problem does not affect Turnover ratio and therefore one can look at Turnover ratio and if it is significantly and positively correlated with economic growth. Because if that is the case the price effect that affects Value traded and Market capitalization do not overshadow the connection between liquidity and economic growth (Levine and Zervos, 1998, p.540).

Volatility: *The average of the 360-day volatility of the national stock market index.* This is a stability measure that just as the name indicates aims to investigate how volatile the market is. As discussed in this thesis there are beliefs that when the integration with the world rises, the volatility increases. On the other hand, there also exist arguments for why this might not be the case. In either case, it is an interesting variable to include. But, as might have been

noticed, this is an index variable and therefore cannot be interpreted as the other "normal" variables. What I will do is to look at the sign the coefficient of this variable has and see if it is negatively or positively correlated with economic growth, and do not make any further analysis of the variable.

### 4.3 Bank sector

Domestic credit to private sector by banks: *Refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as trough loans, purchases of nonequity securities, and trade credits and other accounts receivable that establish a claim for repayment.* This is a depth measure and perhaps the most important one of the proxy variables for financial development in the banking sector. It tries to describe how much capital flows and other types of financial cooperation there are between the private sector and banks. In this case banks mean all banks except central banks and other financial institutions that run under the government.

Bank overhead costs: *Operating expenses of a bank as a share of the value of all assets held.* I have chosen to include Banks overhead costs, which is an efficiency measure that aims to understand how large the banks expenditures are in relation to its earnings. This measure is based on the idea that an efficient bank also tends to earn more money. Nevertheless, this relationship does not always seem to hold.

Bank nonperforming loans: *Ratio of defaulting loans (payments of interest and principal past due date by 90 days or more) to total gross loans (total value of loan portfolio).*

(Z-score): *Captures the probability of default of a country's commercial banking system.* Z-score compares the buffer of a country's commercial banking system (capitalization and returns) with the volatility of those returns. Since it captures the same aspects as the variable Bank nonperforming loans and is an index, I have chosen to focus on Bank nonperforming loans since it is then easier to analyse.

The Banks nonperforming loans (and Z-score) works as a stability measure that attempts to see how uncertain and fragile the market might be. Stability is fundamental for a bank and even though they issue many loans and therefore have many loan takers that does not

necessarily mean that the bank is well working. An unserious bank, or a bank that does not have enough knowledge regarding their clients, can issue plenty of loans, but suffer from not having a sufficient risk analysis. This in turn is something that can lead to the bank having all these issued loans but no one who pays them back (Cihák, et al. 2012 p. 14).

Summary statistics for my chosen variables is presented in Table 2.

| Summary Statistics | GDP per capita growth | Domestic Credit | Banks overhead costs | Banks nonperforming loans | Volatility | Value Traded | Turnover Ratio | Market Capitalization exp 10 largest co | Market Capitalization |
|---|---|---|---|---|---|---|---|---|---|
| Mean | 4.074489 | 89.89163 | 1.874380 | 7.236343 | 24.06540 | 97.62475 | 92.02257 | 58.53068 | 108.9949 |
| Median | 4.114517 | 101.4203 | 1.663204 | 4.000000 | 22.82038 | 56.93813 | 74.81344 | 59.72100 | 73.79882 |
| Maximum | 13.56771 | 202.2924 | 4.093870 | 34.40000 | 47.08925 | 741.5841 | 376.5525 | 85.68200 | 606.0010 |
| Minimum | -5.418784 | 18.15570 | 0.020533 | 0.500000 | 7.770360 | 0.974202 | 7.705224 | 32.01200 | 8.456186 |
| Std. Dev. | 3.560933 | 44.68346 | 0.988767 | 7.584684 | 7.738409 | 136.2972 | 71.97499 | 11.82266 | 114.4382 |
| Skewness | -0.014103 | -0.106474 | 0.613288 | 1.756504 | 0.639341 | 3.320906 | 1.678153 | -0.073800 | 2.413838 |
| Kurtosis | 3.301972 | 2.225924 | 2.326395 | 5.577643 | 3.434666 | 14.71814 | 6.490625 | 2.391166 | 8.885246 |
| | | | | | | | | | |
| Jarque-Bera | 0.402424 | 2.819861 | 8.567279 | 83.06142 | 7.979840 | 793.7493 | 102.5905 | 1.717034 | 253.4988 |
| Probability | 0.817739 | 0.244160 | 0.013792 | 0.000000 | 0.018501 | 0.000000 | 0.000000 | 0.423790 | 0.000000 |
| | | | | | | | | | |
| Sum | 427.8214 | 9438.621 | 196.8099 | 759.8160 | 2526.867 | 10250.60 | 9662.370 | 6145.721 | 11444.46 |
| Sum Sq. Dev. | 1318.745 | 207647.6 | 101.6766 | 5982.853 | 6227.829 | 1932000. | 538761.5 | 14536.62 | 1361994. |
| | | | | | | | | | |
| Observations | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |

Table 2

When I had decided on what variables to choose I checked their correlations to see that they were not too high. The result is presented in the correlation matrix, Table 3, below.

| Correlation Matrix | GDP per capita growth | Domestic Credit | Banks overhead costs | Banks nonperforming loans | Z-score | Volatility | Value Traded | Turnover Ratio | Market Capitalization exp 10 largest co | Market Capitalization |
|---|---|---|---|---|---|---|---|---|---|---|
| GDP per capita growth | 1.0000 | -0.0060 | -0.0820 | 0.0142 | 0.1778 | -0.1300 | -0.0337 | 0.1316 | 0.2982 | -0.0149 |
| Domestic Credit | | 1.0000 | -0.5054 | -0.2863 | -0.1425 | -0.0243 | 0.5630 | 0.3178 | 0.3616 | 0.5499 |
| Banks overhead costs | | | 1.0000 | 0.0853 | -0.0728 | 0.0951 | 0.1274 | -0.3093 | -0.4565 | 0.0459 |
| Banks nonperforming loans | | | | 1.0000 | 0.0560 | -0.0808 | -0.3570 | -0.3512 | -0.1509 | -0.2886 |
| Z-score | | | | | 1.0000 | -0.1540 | -0.1318 | -0.2661 | 0.1642 | 0.0460 |
| Volatility | | | | | | 1.0000 | 0.2821 | 0.5200 | -0.1325 | -0.0233 |
| Value Traded | | | | | | | 1.0000 | 0.3670 | 0.0551 | 0.8178 |
| Turnover Ratio | | | | | | | | 1.0000 | 0.0756 | -0.0187 |
| Market Capitalization exp 10 largest co | | | | | | | | | 1.0000 | -0.0316 |
| Market Capitalization | | | | | | | | | | 1.0000 |

Table 3

Last but not least there are the control variables. These are added to the regression to control for all the things that are mentioned in the literature review part that has an influence both on the countries economic growth and their financial development. They are all well known to researchers and often used in regression models. To measure the well being of a country's citizens one need a human capital variable. Because if the population is healthy and have possibilities to grow both physically, but also intellectually, there is a greater chance that the country as a whole will prosper and grow stronger. The human capital variable that I have used is *Secondary school enrolment*. It is the most implemented in previous literature and the one that seems to capture what the variable try to measure in the most precise way. Further, we have *Inflation* that attempts to capture the stability aspect in the economy. The expected future inflation rate may affect ones decision making since it decides how much the value of your money will vary. Macroeconomic instability and economic activity is believed to have a negative correlation, therefore Inflation should have a negative relationship to GDP.

Additionally, as previously described, savings rate are likely to change together with a country's capital flows. This is the reason to why *Gross domestic savings* is the third control variable and overall an important part of this topic. Moreover, as stated earlier, when dealing with these questions, it is good to get a picture to what extent the government is affecting the

financial businesses. Therefore, *Government consumption expenditure* is also included because it might influence savings rate and growth via taxation modifications and other new government decided policies (Barro, 1991, p. 430). Finally, there is the important question regarding the openness of the country. I have already discussed this matter and really do think that this has had a huge impact in what ways these countries have developed, and I am not alone to believe this. Therefore, I have added *Total flows* (Total Export + Total Import) as my last control variable (Chinn and Ito, 2006, p. 166; Bekaert et al. 2005, p. 29).

Attention should be paid to the fact that there exist different forms of openness. Export and import measures are one kind of trade openness measure, whereas for example, an index called the KAOPEN index is more of a financial openness measure. If there is a paper where the main focus is on how openness influences the country, one should think about what kind of openness the variables try to proxy for. But for a general measure of openness Total export or Total flows are often used and normally sufficient.

Moreover, numerous indices for corruption have also been created and with the years the corruption and legal system aspects has increased its importance. I have not included a corruption measure as one of my control variables in the regression model, a reason for which I will explain in the limitation section.

### 4.4 Limitations

A classic problem that arises when dealing with developing countries is the lack of data. In this paper I have missing observations in several of my variables, which could affect my results, but all pre-cautions have been made in an attempt to minimize this problem (Verbeek, 2012, p.50-51). Today this is a smaller problem and now there is a long enough time span to be able to get good results. The lack of data in the beginning and middle of the $20^{th}$ century is the reason to why my data start in 1985, before that it was just to few observations to be able to include the data in the model. Still, along the way some variables could not be included because of the fact that the data was not complete enough. In addition, there are variables in this paper that lack complete data coverage, which of course, is never desirable. The reason for this is that it can cause biased results and make it more difficult to fit a regression equation for the data.

In addition, missing data leads to unbalanced panel, which can be unbalanced in either a random or non-random way. Using incomplete panel data may cause selection bias. If data is randomly missing, it usually does not occur any problems and the estimator is still consistent (Verbeek, 2012, p.425-426). But Eviews, the software I have been working with, is using unbalanced data. When you have unbalanced data and fixed effects the estimators are constructed in another way in order to remain consistent (Verbeek, 2012, p.426).

Not including a variable that is correlated with the included ones will cause omitted variable bias, which is a serious problem to deal with. Panel data is argued to lower the impact of this problem (Verbeek, 2012 p. 375-376), for example by working with fixed effects as I have done in this paper. A further explanation of the implication with fixed effect is included in the model and method section. Still, when dealing with questions as the ones in this thesis, it is almost inevitable to fail to include a complete set of variables that captures all the necessary aspects of finance and growth.

For instance, I was not able to include a corruption control variable. This is of course an important variable and something that should be controlled for, especially in countries where it is very likely that problems in the legal system exist. The corruption variables I have looked at were the World Banks corruption variable called "CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)". The countries are rated according to sixteen different criteria's and where the World Bank states that: "… higher scores can be attained by a country that, given its stage of development, has a policy and institutional framework that more strongly fosters growth and poverty reduction". A second variable that I considered was Strength of legal rights index (0=weak to 12=strong) that also is available in the World Bank database. The index is constructed by an extensive survey and thus, somewhat different from the previous corruption index. Anyhow, I did not succeed in adding such a variable. This was due to a number of reasons; one of them being that there was not enough data for the countries in my study. Another issue was that the variable did not change much over time, for some countries not at all, which made them hard to include. The latter problem also occurred when trying to use a more precise financial openness measure called the KAOPEN index, used in Chinn and Ito (2006). Such data is hard to include when working with fixed effects since it is based on averages and will not give usable results if a variable is constant over time.

Also, in Levine and Zervos (1998) they look at more then one growth measure, where they add the capital stock growth as a good indicator of growth as well. The fact that I am only testing for one GDP measure could be limiting.

Moreover, another issue that one should think of is multicollinearity. Included variables can be correlated to some extent, but not too much. If the variables are highly correlated the model can experience problems with recognizing the individual impact of each variable. Furthermore, high correlation can cause unexpected signs of the coefficients and unreliable standard errors (Verbeek, 2012, p. 43-46).

Further, the causality question should be mentioned and I want to highlight that I only have tested for the one way question if financial development imply economic growth, but that does not mean that other relationships does not exists, only that they are not discussed and are entirely excluded from this paper. Nevertheless, this should be kept in mind when reading and analysing my results.

## 5.0 Results

As previously mentioned and discussed there are various aspects of financial development and its impact on economic growth. But, as one can see in the tables below, there seems to be at least one kind of relationship between financial development and economic growth. Obviously, only to state that there exists a correlation among the two is way to simplistic and does not give very much insight and knowledge in which ways they are connected. As illustrated in the tables further down, not all proxy variables are significant. For the stock market variable *Turnover ratio*, Table 6 shows that it is significant at a five percent level, while one can see in Table 5 that *Value traded* is non-significant for all significant levels. What does this imply for the financial market in these countries? A significant Turnover ratio variable means that the economic growth benefits from having an active market with functioning trades. Value traded on the other hand tries to capture the size of the financial market in comparison to the entire economy and this feature could not be proven to be significant. Meaning, what one can say about these countries financial development when it comes to economic growth is that it does spur growth in being an active market with capital moving, but that this market does not need to be of great size to have an impact. Maybe does

the insignificance of the Market capitalization variable, displayed in Table 4 follow the same pattern since that is also a size measure that was insignificant and thus might not be important. An additional cause to the insignificant results, concerning the variable Market capitalization excluding the ten largest companies, is that there was not that many observations for that variable, which makes it more difficult to get significant results.

Mohtadi and Agarwal (p.12) also obtained a result where Value traded was non-significant, or at least only marginally significant, and a Turnover ratio that was highly significant. They motivate these findings by saying that the financial market is very volatile; implying that Value traded might not be the perfect measure of financial development.

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -30.2363 | 15.9102 | -1.9004 | 0.0587 |
| Domestic Credit | -0.0272 | 0.0086 | -3.1678 | 0.0018 |
| Market Capitalization | 0.0079 | 0.0052 | 1.5120 | 0.1320 |
| Total Flows | 0.0648 | 0.0146 | 4.4270 | 0.0000 |
| log(Government Consumption) | 1.1622 | 0.5947 | 1.9544 | 0.0520 |
| Inflation | -0.1126 | 0.0279 | -4.0386 | 0.0001 |
| Secondary School | -0.0298 | 0.0271 | -1.0980 | 0.2734 |
| Savings | 0.1098 | 0.0438 | 2.5070 | 0.0129 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.6600 | | | |
| Total panel (unbalanced) observations | 259 | | | |

Table 4

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -32.8883 | 16.2998 | -2.0177 | 0.0449 |
| Domestic Credit | -0.0264 | 0.0087 | -3.0327 | 0.0027 |
| Value Traded | 0.0014 | 0.0029 | 0.4590 | 0.6467 |
| Total Flows | 0.0690 | 0.0148 | 4.6757 | 0.0000 |
| log(Government Consumption) | 1.2653 | 0.6077 | 2.0820 | 0.0385 |
| Inflation | -0.1154 | 0.0279 | -4.1301 | 0.0001 |
| Secondary School Enrolment | -0.0304 | 0.0272 | -1.1168 | 0.2653 |
| Savings | 0.1097 | 0.0441 | 2.4878 | 0.0136 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.6566 | | | |
| Total panel (unbalanced) observations | 258 | | | |

Table 5

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -39.9188 | 16.6837 | -2.3927 | 0.0176 |
| Domestic Credit | -0.0230 | 0.0084 | -2.7335 | 0.0068 |
| Turnover Ratio | 0.0089 | 0.0040 | 2.2232 | 0.0273 |
| Total Flows | 0.0763 | 0.0143 | 5.3405 | 0.0000 |
| log(Government Consumption) | 1.4922 | 0.6191 | 2.4104 | 0.0168 |
| Inflation | -0.1436 | 0.0306 | -4.6967 | 0.0000 |
| Secondary School Enrolment | -0.0248 | 0.0280 | -0.8885 | 0.3753 |
| Savings | 0.0776 | 0.0444 | 1.7476 | 0.0820 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.6927 | | | |
| Total panel (unbalanced) observations | 245 | | | |

Table 6

Furthermore, another reason to why not all of my stock market variables were significant can be due to the previously discussed threshold level. Such that, even though not all of my sample countries are developing countries, the more part is and therefore might not have reached this threshold. This fact then leads to that the markets are not yet prepared for this development and growth and will not benefit from introducing a more advance financial system today. Meaning that, running the regression I have done in this thesis did not give significant results for all variables, because today these factors does not produce any economic growth.

As for the banking variables Domestic credit to private sector it is significant at a five percent level in all regression. A significant Domestic credit variable means that economic growth profits from having an increased number of credit affairs between the private sector and depository corporations. Meaning that the society benefits from not being completely economically controlled by the government, but instead creating more banks and other non-government owned financial institutions to improve the financial system.

For the other banking variables the picture is a bit different. Banks nonperforming loans, Z-score and Banks overhead costs are never significant at a five percent level and could therefore not be proven to have an impact on economic growth. These variables are stability and efficiency measure respectively, which are two aspects that have been argued to be of importance. But for these countries it seems as if their relationship with growth were too weak to show any results in the regressions. One contribution to the weak results might be that there were plenty of missing observations for these variables in comparison to, for instance, Domestic credit to private sector by banks that had much larger data coverage. Concerning the variable Banks overhead costs, another reason for its insignificant result could be that even though a more efficient financial institution usually have a larger profit, this is not always the case. This is due to the fact that the financial institution can respond to changes in the market, such that if there is a positive or negative shock on the market the variable will move together with that shock, regardless of its efficiency. Leading to that the relationship between efficiency and profitability is not always that strong.

In general, when dealing with developing countries, previous research has suggested that the banking sector seems to be of higher importance then the stock market. Looking at my results, the main proxy variable for the banking sector is indeed significant in all regressions, stating that financial institutions does play an important role for these countries. Furthermore, if we look at the results in Table 6 we see that the coefficient for Domestic credit is larger than the one for Turnover ratio, indicating that Domestic credit has a bigger impact on economic growth than Turnover ratio. This in turn gives an indication that the banking sector in general might be more essential for the countries growth than the stock market. But since there are both stock market variables and bank sector variables that are insignificant, this conclusion might not always hold.

Additionally, the signs on the variables should also be included. If we look at Tables 4,5 and 6, most of the variables enter the regression with the expected sign. For example, we expect Turnover ratio to have a positive linkage with GDP, since a more active market should spur economic growth. But there is one question mark that arises in several of the results, namely Domestic credit that seems to have a negative sign. One would expect that a higher interaction between the private sector and commercial banks should lead to more growth. This intuition goes hand in hand with the general idea that a country needs to open up and lower the power of the government in order to prosper and develop. Indeed, Cihák, et al. (2012, p.12) discuss this and state that plenty of papers have found a significant positive relationship between Domestic credit and economic growth, which make my results hard to motivate. It is more likely that there is some sort of misspecification in my result and that Domestic credit actually should have a positive coefficient.

Moreover, as already stated, Volatility is an index variable, but it might still be interesting to analyse the sign of the coefficient. The results are displayed in Table 7 where Stock price volatility enters the regression with a positive sign. Thus, this indicates that a higher volatility lead to increased economic growth.

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -51.7756 | 15.4092 | -3.3600 | 0.0010 |
| Domestic Credit | -0.0353 | 0.0082 | -4.3007 | 0.0000 |
| Volatility | 0.0320 | 0.0129 | 2.4779 | 0.0141 |
| Total Flows | 0.0931 | 0.0139 | 6.7112 | 0.0000 |
| log(Government Consumption) | 1.9610 | 0.5710 | 3.4344 | 0.0007 |
| Inflation | -0.1434 | 0.0343 | -4.1797 | 0.0000 |
| Secondary School Enrolment | -0.0684 | 0.0284 | -2.4036 | 0.0172 |
| Savings | 0.1106 | 0.0487 | 2.2696 | 0.0244 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.7507 | | | |
| Total panel (unbalanced) observations | 226 | | | |

Table 7

In addition, all of my results are robust when adding White cross-section, White period or White diagonal standard errors.

Finally, all the other performed regression can be found in the Appendix. There, they are divided depending on which banking variable that was included in the equation.

### 5.1 Interaction terms

When I ran the standard regressions in the previous section the only significant relationship I found was between Turnover ratio and Domestic Credit. This is of course, and indeed discussed above, also a result and could tell us something about the ways finance have an influence on these economies. But in my set of countries many changes have taken place during the observed time period and these openings and liberalizations are most likely to have had a great influence on the development we have seen in reality for this part of Asia. For this reason I decided to work with interactive terms to see if my variables together with Total flows could be proven to be significant.

The results vary; some are expected while others are not. I have included all results that were significant. In Table 8 the interaction term with Total flows and Market capitalization is significant at a ten percent level, which indicate that together with augmented openness a larger market becomes linked with economic growth. The same thing stands for Value traded, which also enters the regression significantly at a five percent level with Total flows (Table 9). Also, indicating that the size of the financial market does have an impact when the country is opening up. An unexpected result is that both interaction variables have negative coefficients. This would mean that openness and larger markets are negatively correlated with growth, which intuitively does not make much sense.

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -23.9774 | 16.2186 | -1.4784 | 0.1408 |
| Domestic Credit | -0.0288 | 0.0086 | -3.3500 | 0.0010 |
| Market Capitalization | 0.0198 | 0.0085 | 2.3339 | 0.0205 |
| Total Flows Market Capitalization | -8.31E-05 | 4.68E-05 | -1.7753 | 0.0773 |
| Total Flows | 0.0770 | 0.0161 | 4.7810 | 0.0000 |
| Savings | 0.1053 | 0.0436 | 2.4141 | 0.0166 |
| Inflation | -0.1133 | 0.0277 | -4.0851 | 0.0001 |
| Secondary School Enrolment | -0.0294 | 0.0270 | -1.0899 | 0.2770 |
| log(Government Expenditure) | 0.9135 | 0.6081 | 1.5022 | 0.1345 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.6649 | | | |
| Total panel (unbalanced) observations | 259 | | | |

Table 8

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -32.5482 | 16.1716 | -2.0127 | 0.0454 |
| Domestic Credit | -0.0266 | 0.0086 | -3.0777 | 0.0024 |
| Value Traded | 0.0145 | 0.0069 | 2.1019 | 0.0367 |
| Total Flows Value Traded | -7.33E-05 | 3.49E-05 | -2.1042 | 0.0365 |
| Total Flows | 0.0782 | 0.0153 | 5.1174 | 0.0000 |
| Savings | 0.0981 | 0.0441 | 2.2263 | 0.0270 |
| Inflation | -0.1133 | 0.0277 | -4.0827 | 0.0001 |
| Secondary School Enrolment | -0.0239 | 0.0272 | -0.8765 | 0.3817 |
| log(Government Expenditure) | 1.2208 | 0.6033 | 2.0235 | 0.0443 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.6636 | | | |
| Total panel (unbalanced) observations | 258 | | | |

Table 9

The only interaction term equation that was significant at a ten percent level when the interaction term consisted of a bank variable and Total flows was the one presented in Table 10, namely between Turnover ratio, Bank overhead costs and Total flowsBank Overhead costs. Again, we have a proxy variable that were insignificant when treated as an independent variable, but significant together with Total flows. In addition, what one might notice is that Turnover ratio and Domestic credit to private sector by banks did not remain significant when added together with Total flows. This result might tell us that the financial surroundings change when opening up a country and perhaps gives the banking sector and the stock market different impact on the country's economy.

| Dependent Variable: GDP per capita growth | | | | |
|---|---|---|---|---|
| Method: Panel Least Squares | | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | -9.9205 | 27.4818 | -0.3610 | 0.7187 |
| Turnover Ratio | 0.0105 | 0.0046 | 2.3005 | 0.0231 |
| Bank overhead costs | 0.5756 | 0.3356 | 1.7153 | 0.0888 |
| Total Flows Bank overhead costs | -0.0095 | 0.0033 | -2.8897 | 0.0046 |
| Total Flows | 0.1057 | 0.0183 | 5.7880 | 0.0000 |
| Savings | 0.0213 | 0.0583 | 0.3655 | 0.7154 |
| Inflation | 0.0146 | 0.0588 | 0.2480 | 0.8045 |
| Secondary School Enrolment | 0.1187 | 0.0393 | 3.0209 | 0.0031 |
| log(Government Expenditure) | -0.0790 | 1.0006 | -0.0789 | 0.9372 |
| | | | | |
| Effects Specification | | | | |
| | | | | |
| Cross-section fixed (dummy variables) | | | | |
| Period fixed (dummy variables) | | | | |
| | | | | |
| R-squared | 0.7211 | | | |
| Total panel (unbalanced) observations | 157 | | | |

Table 10

## 6.0 Conclusion

The purpose of this thesis was to investigate if financial development can generate economic growth. To find an answer I used a static linear panel model with two way fixed effects, and performed 20 regressions with 9 different stock and banking proxy variables.

In summary, it can be stated that my results are not significant throughout my thesis, but at the same time does confirm the existence of a relationship between financial development and economic growth. The reason for using several proxy variables was as an attempt to test for specific features of the financial system in relation to economic growth. My main stock market variables were *Market capitalization*, *Value traded* and *Turnover ratio*, where Turnover ratio was the only one that could be proven to be significant. The other stock market variable, *Market capitalization excluding top ten largest companies* were also insignificant. The fifth, and last stock market variable, *Volatility*, where I only looked at the sign, entered

the regression with a positive coefficient. This means that increased stock market volatility leads to higher economic growth.

As for the banking sector variables I used *Domestic credit to private sector by banks*, *Banks overhead costs and Banks nonperforming loans*. The main variable was Domestic credit to private sector by banks, which were significant for all the regressions. These results show that also the banks have an influence on economic growth. Still, the other two banking variables were not significant and therefore could not capture the relationship between financial development and economic growth for the countries in my sample.

In my hypothesis I stated that there is a connection between financial development and economic growth, and that this connection can begin with a development in the financial system, which then leads to economic growth. If one looks at the results, this hypothesis hold to some extent, but is in a sense too simple to capture in what way this connection between financial development and economic growth work.

Similarly to previous literature, the results in this thesis vary and do not provide a simple picture of a country's economic growth caused by financial development. Nevertheless, it has given some insight on what factors in the financial system that are important for an Asian country's economic growth.

Ideas for further research could be to use a dynamic model and focus more on causal linkage. This has been done before, but not with these exact countries and variables. In general, all the aspects I have discussed in this paper, such as the legal system and openness, are topics one can focus on and elaborate further upon. Furthermore, it could also be interesting to include more countries from the Asian region to broaden the picture, and perhaps increase the time span to better capture the true relationship for what we try to proxy for.

## 7.0 References


Arestis, Demetriades and Luintel (2001), "Financial Development and Economic Growth: The Role of Stock Markets", *Journal of Money, Credit and Banking*, Vol. 33, No.1, pp. 16-41 http://www.jstor.org/stable/2673870?seq=1#page_scan_tab_contents 2014-11-12

Barro, R (1991), "Economic Growth in a Cross Section of Countries", *The Quarterly Journal of Economics*, Vol, 106, No.2, pp. 407-443 http://www.jstor.org/stable/2937943?seq=1#page_scan_tab_contents 2014-11-17

Bekaert and Harvey (2002), "Research in emerging markets finance: looking to the future, *Emerging Markets Review* 3, 429-448 http://www.sciencedirect.com/science/article/pii/S1566014102000456 2014-11-20

Bekaert and Harvey (2003), "Emerging markets finance", *Journal of Empirical Finance* 10, 3-55 http://www.sciencedirect.com/science/article/pii/S0927539802000543 2014-11-20

Bekaert, Harvey and Lumsdaine (2002), "The dynamics of emerging market equity flows", *Journal of International Money and Finance* 21 http://www.sciencedirect.com/science/article/pii/S0261560602000013 2014-11-20

Bekaert, Harvey, Lumsdaine, (2002) "Dating the integration of world equity markets", *Journal of Financial Economics* 65, 203-247 http://www.sciencedirect.com/science/article/pii/S0304405X02001393 2014-12-08

Bekaert, Harvey and Lundblad (2005), "Does financial liberalization spur growth?", *Journal of Financial Economics* 77, 3-55 http://www.sciencedirect.com/science/article/pii/S0304405X04002193 2014-12-08

Bekaert, Harvey and Lundblad, (2006), "Growth volatility and financial liberalization", *Journal of International Money and Finance* 25, 370-403 http://www.sciencedirect.com/science/article/pii/S0261560606000040 2014-12-08

Biswas (2008), "Does Finance Lead to Economic Growth? An Empirical Assessment of 12 Asian Economies", *Margin: The Journal of Applied Economic Research* 2008 2:229 http://mar.sagepub.com/content/2/3/229.full.pdf+html 2014-12-02

Caporale, Howells, Soliman (2004), "Stock market development and Economic Growth: The causal linkage, *Journal of Economic Development,* Vol. 29, No.1 http://www.jed.or.kr/full-text/29-1/02_J665_.PDF 2014-12-02

Chinn, M and Ito, H (2006) "What matters for financial development? Capital controls, institutions, and interactions", *Journal of Development Economics* 81, 163-192 http://www.sciencedirect.com/science/article/pii/S0304387805001409# 2014-11-13

Cihák, Demirgüç-Kunt, Feyen, Levine (2012), "Benchmarking Financial Systems around the World", *Policy Research Working Paper* 6175, The World Bank http://documents.worldbank.org/curated/en/2012/08/16669897/benchmarking-financial-systems-around-world 2014-11-11

Creane, Goyal, Mobarak and Sab (2007), "Measuring Financial Development in the Middle East and North Africa: A New Database", *IMF Staff Papers,* Vol. 53, No.3 http://www.jstor.org/discover/10.2307/30035923?sid=21105676653363&uid=28645&uid=3&uid=3738984&uid=2&uid=70&uid=28646&uid=2134&uid=62&uid=67 2014-11-11

Ito, H (2006), "Financial development and financial liberalization in Asia: Thresholds, institutions and the sequence of liberalization", *The North American Journal of Economics and Finance* 17, 303-327 http://www.sciencedirect.com/science/article/pii/S1062940806000350 2014-11-20

Kose, Prasad, Rogoff and Wei (2006) "Financial Globalization: A Reappraisal" *NBER Working Paper* 12484 http://www.nber.org/papers/w12484 2014-11-20

La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000), "Investor protection and corporate governance", *Journal of Financial Economics* 58, 3-27 http://www.sciencedirect.com/science/article/pii/S0304405X00000659 2014-12-12

Levine, R (1996) “Financial Development and Economic Growth”, *The World Bank: Policy Research Department*
http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-1678 2014-11-05

Levine and Zervos (1998), “Stock Markets, Banks, and Economic Growth, *The American Economic Review*, Vol. 88, No.3, pp. 537-558
http://www.jstor.org/stable/116848?seq=1#page_scan_tab_contents 2014-11-12

Li, K-W (2012), *Economic Freedom- Lessons of Hong Kong,* World Scientific Publishing Company, Singapore

Mc Kinnon, R (1973), *Money & Capital in Economic Development,* The Brookings Institution, Washington D.C

Mohtadi and Agarwal (no year), “Stock Market Development and Economic Growth: Evidence from Developing Countries”, Authors are, Associate Professor, University of Wisconsin-Milwaukee and Senior Quantitative Analyst, Fleet Financial, Providence, RI.
http://faculty.apec.umn.edu/mohta001/pa1-4-01.pdf 2014-11-10

Purfield, Oura, Kramer and Jobst 2006, “Asian Equity Markets: Growth, Opportunities, and Challenges, *International Monetary Fund Working Paper* 266
https://www.imf.org/external/pubs/ft/wp/2006/wp06266.pdf 2014-11-14

Robinson, J (1952) p.86, *The Rate of Interest,* MacMillan & Co, London

Seetanah, Sawkut, Sannasee and Seetanah (2008), “Stock Market Development and Economic Growth in Developing countries: Evidence from Panel VAR framework”, University of Mauritius, The World Bank
http://www.csae.ox.ac.uk/conferences/2010-edia/papers/041-seetanah.pdf 2014-11-04

Seetanah, Subadar, Sannassee, Lamport and Ajageer (2012), “Stock market development and economic growth: Evidence from least developed countries”, *Berlin Working Papers on Money, Finance, Trade and Development*, No.5

http://daadpartnership.htw-berlin.de/fileadmin/working_paper_series/wp_05_2012_Seetanah-et-al_Stock-market.pdf 2014-10-29

Schumpeter, J (1912), *The Theory of Economic Development,* Transaction Publishers, New Brunswick, New Jersey

Stiglitz, J (2000), "Capital Market Liberalization, Economic Growth, and Instability*", World Development,* Vol. 28, No.6, pp. 1075-1086
http://www.sciencedirect.com/science/article/pii/S0305750X00000061 2014-12-04

Verbeek, M (2012), *A Guide to Modern Econometrics- Fourth Edition,* John Wiley & Sons Ltd., Chichester

Yu, Fung and Tam (2010), "Assessing financial market integration in Asia- Equity markets", *Journal of Banking & Finance* 34, 2874-2885
http://www.sciencedirect.com/science/article/pii/S0378426610000725 2014-12-05

# 8.0 Appendix

The information in Table 11 holds for all regressions that will be presented in this appendix.

| Dependent Variable: GDP_PER_CAPITA_GROWTH__A |
|---|
| Method: Panel Least Squares |
| Cross-section fixed (dummy variables) |
| Period fixed (dummy variables) |

Table 11

*8.1 Domestic credit to private sector by banks*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -130.3442 | 35.16182 | -3.706981 | 0.0004 |
| DOMESTIC_CREDIT_TO_PRIVA | -0.024970 | 0.011202 | -2.229001 | 0.0286 |
| MARKET_CAPITALIZATION_EX | -0.037469 | 0.032063 | -1.168609 | 0.2460 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.082235 | 0.018249 | 4.506203 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 4.650997 | 1.308902 | 3.553357 | 0.0006 |
| INFLATION__GDP_DEFLATOR_ | -0.106212 | 0.036286 | -2.927082 | 0.0045 |
| SECONDARY_SCHOOL_ENROLLM | -0.032519 | 0.057574 | -0.564820 | 0.5738 |
| GROSS_DOMESTIC_SAVINGS__ | 0.016862 | 0.093889 | 0.179595 | 0.8579 |
| | | | | |
| R-squared | 0.867526 | | | |
| Total panel (unbalanced) observations | 110 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -30.23626 | 15.91019 | -1.900434 | 0.0587 |
| DOMESTIC_CREDIT_TO_PRIVA | -0.027212 | 0.008590 | -3.167827 | 0.0018 |
| MARKET_CAPITALIZATION_OF | 0.007891 | 0.005219 | 1.512018 | 0.1320 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.064753 | 0.014627 | 4.427031 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 1.162240 | 0.594684 | 1.954382 | 0.0520 |
| INFLATION__GDP_DEFLATOR_ | -0.112576 | 0.027875 | -4.038587 | 0.0001 |
| SECONDARY_SCHOOL_ENROLLM | -0.029761 | 0.027103 | -1.098046 | 0.2734 |
| GROSS_DOMESTIC_SAVINGS__ | 0.109757 | 0.043781 | 2.506981 | 0.0129 |
| | | | | |
| R-squared | 0.659971 | | | |
| Total panel (unbalanced) observations | 259 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -32.88825 | 16.29975 | -2.017715 | 0.0449 |

| | | | | |
|---|---|---|---|---|
| DOMESTIC_CREDIT_TO_PRIVA | -0.026400 | 0.008705 | -3.032726 | 0.0027 |
| STOCKS_TRADED__TOTAL_VAL | 0.001352 | 0.002945 | 0.458954 | 0.6467 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.069041 | 0.014766 | 4.675714 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 1.265325 | 0.607732 | 2.082045 | 0.0385 |
| INFLATION__GDP_DEFLATOR_ | -0.115405 | 0.027942 | -4.130121 | 0.0001 |
| SECONDARY_SCHOOL_ENROLLM | -0.030430 | 0.027247 | -1.116814 | 0.2653 |
| GROSS_DOMESTIC_SAVINGS__ | 0.109672 | 0.044083 | 2.487832 | 0.0136 |
| | | | | |
| R-squared | 0.656595 | | | |
| Total panel (unbalanced) observations | 258 | | | |

## *8.2 Banks nonperforming loans*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -53.30320 | 41.31300 | -1.290228 | 0.2020 |
| BANK_NONPERFORMING_LOANS | -0.090150 | 0.059141 | -1.524331 | 0.1328 |
| MARKET_CAPITALIZATION_EX | -0.025770 | 0.030752 | -0.837998 | 0.4054 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.053473 | 0.022987 | 2.326185 | 0.0235 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 1.954088 | 1.510454 | 1.293708 | 0.2008 |
| INFLATION__GDP_DEFLATOR_ | 0.065095 | 0.078348 | 0.830850 | 0.4094 |
| SECONDARY_SCHOOL_ENROLLM | -0.063140 | 0.063199 | -0.999070 | 0.3218 |
| GROSS_DOMESTIC_SAVINGS__ | 0.115556 | 0.099435 | 1.162121 | 0.2499 |
| | | | | |
| R-squared | 0.852108 | | | |
| Total panel (unbalanced) observations | 86 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -50.84709 | 33.15906 | -1.533430 | 0.1296 |
| BANK_NONPERFORMING_LOANS | -0.045267 | 0.049892 | -0.907296 | 0.3673 |
| MARKET_CAPITALIZATION_OF | 0.001895 | 0.005801 | 0.326724 | 0.7448 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.043123 | 0.018994 | 2.270303 | 0.0262 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 1.725666 | 1.189639 | 1.450580 | 0.1513 |
| INFLATION__GDP_DEFLATOR_ | 0.075214 | 0.068756 | 1.093927 | 0.2777 |
| SECONDARY_SCHOOL_ENROLLM | -0.043341 | 0.053615 | -0.808370 | 0.4216 |
| GROSS_DOMESTIC_SAVINGS__ | 0.183503 | 0.082589 | 2.221873 | 0.0295 |
| | | | | |
| R-squared | 0.832126 | | | |
| Total panel (unbalanced) observations | 101 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -44.47257 | 35.00794 | -1.270357 | 0.2081 |
| BANK_NONPERFORMING_LOANS | -0.048700 | 0.050631 | -0.961850 | 0.3394 |

| | | | | |
|---|---|---|---|---|
| STOCKS_TRADED__TOTAL_VAL | -0.001365 | 0.002839 | -0.480908 | 0.6321 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.049831 | 0.019797 | 2.517103 | 0.0141 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 1.479446 | 1.261472 | 1.172793 | 0.2448 |
| INFLATION__GDP_DEFLATOR_ | 0.072924 | 0.067917 | 1.073721 | 0.2866 |
| SECONDARY_SCHOOL_ENROLLM | -0.032096 | 0.055627 | -0.576976 | 0.5658 |
| GROSS_DOMESTIC_SAVINGS__ | 0.176878 | 0.084172 | 2.101380 | 0.0392 |
| | | | | |
| R-squared | 0.832419 | | | |
| Total panel (unbalanced) observations | 101 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -86.89429 | 35.95039 | -2.417061 | 0.0182 |
| BANK_NONPERFORMING_LOANS | 0.020720 | 0.056133 | 0.369129 | 0.7131 |
| STOCKS_TRADED__TURNOVER_ | 0.010716 | 0.004777 | 2.243478 | 0.0280 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.045264 | 0.017020 | 2.659470 | 0.0097 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 2.947624 | 1.275371 | 2.311190 | 0.0237 |
| INFLATION__GDP_DEFLATOR_ | 0.047989 | 0.066543 | 0.721179 | 0.4732 |
| SECONDARY_SCHOOL_ENROLLM | -0.076656 | 0.053627 | -1.429411 | 0.1573 |
| GROSS_DOMESTIC_SAVINGS__ | 0.245208 | 0.084052 | 2.917355 | 0.0047 |
| | | | | |
| R-squared | 0.843003 | | | |
| Total panel (unbalanced) observations | 101 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -75.47480 | 40.25499 | -1.874918 | 0.0654 |
| BANK_NONPERFORMING_LOANS | -0.045285 | 0.055677 | -0.813360 | 0.4190 |
| STOCK_PRICE_VOLATILITY | 0.056468 | 0.050986 | 1.107508 | 0.2722 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.053002 | 0.020092 | 2.637944 | 0.0105 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 2.584483 | 1.453686 | 1.777883 | 0.0802 |
| INFLATION__GDP_DEFLATOR_ | 0.070306 | 0.072598 | 0.968438 | 0.3365 |
| SECONDARY_SCHOOL_ENROLLM | -0.080782 | 0.067051 | -1.204769 | 0.2327 |
| GROSS_DOMESTIC_SAVINGS__ | 0.179231 | 0.085171 | 2.104368 | 0.0393 |
| | | | | |
| R-squared | 0.843470 | | | |
| Total panel (unbalanced) observations | 92 | | | |

### *8.3 Banks overhead costs*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -56.47984 | 34.49467 | -1.637350 | 0.1057 |
| BANK_OVERHEAD_COSTS_TO_T | -0.322589 | 0.331019 | -0.974535 | 0.3329 |
| MARKET_CAPITALIZATION_EX | -0.048912 | 0.028546 | -1.713428 | 0.0907 |

| | | | | |
|---|---|---|---|---|
| TOTAL_FLOWS__IMPORT_EXPO | 0.054597 | 0.017370 | 3.143243 | 0.0024 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 1.977011 | 1.284607 | 1.539000 | 0.1280 |
| INFLATION__GDP_DEFLATOR_ | -0.019431 | 0.071728 | -0.270894 | 0.7872 |
| SECONDARY_SCHOOL_ENROLLM | 0.009281 | 0.057567 | 0.161226 | 0.8723 |
| GROSS_DOMESTIC_SAVINGS__ | 0.072700 | 0.092134 | 0.789062 | 0.4325 |
| | | | | |
| R-squared | 0.819575 | | | |
| Total panel (unbalanced) observations | 105 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -7.914000 | 28.58903 | -0.276819 | 0.7824 |
| BANK_OVERHEAD_COSTS_TO_T | -0.083296 | 0.245710 | -0.339003 | 0.7352 |
| MARKET_CAPITALIZATION_OF | -0.005193 | 0.006742 | -0.770182 | 0.4427 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.076461 | 0.015821 | 4.833006 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | -0.045270 | 1.037895 | -0.043618 | 0.9653 |
| INFLATION__GDP_DEFLATOR_ | 0.007234 | 0.061169 | 0.118264 | 0.9060 |
| SECONDARY_SCHOOL_ENROLLM | 0.128550 | 0.041074 | 3.129726 | 0.0022 |
| GROSS_DOMESTIC_SAVINGS__ | 0.005446 | 0.060120 | 0.090580 | 0.9280 |
| | | | | |
| R-squared | 0.695503 | | | |
| Total panel (unbalanced) observations | 157 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | 8.829105 | 28.83327 | 0.306212 | 0.7600 |
| BANK_OVERHEAD_COSTS_TO_T | 0.098053 | 0.249638 | 0.392782 | 0.6952 |
| STOCKS_TRADED__TOTAL_VAL | -0.007604 | 0.003061 | -2.484444 | 0.0143 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.085795 | 0.015516 | 5.529438 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | -0.704500 | 1.052600 | -0.669296 | 0.5046 |
| INFLATION__GDP_DEFLATOR_ | 0.011257 | 0.059652 | 0.188715 | 0.8506 |
| SECONDARY_SCHOOL_ENROLLM | 0.134173 | 0.040093 | 3.346529 | 0.0011 |
| GROSS_DOMESTIC_SAVINGS__ | 0.024597 | 0.059340 | 0.414515 | 0.6792 |
| | | | | |
| R-squared | 0.708554 | | | |
| Total panel (unbalanced) observations | 157 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -16.28864 | 28.19354 | -0.577744 | 0.5645 |
| BANK_OVERHEAD_COSTS_TO_T | -0.111952 | 0.243551 | -0.459664 | 0.6466 |
| STOCKS_TRADED__TURNOVER_ | 0.008553 | 0.004646 | 1.840753 | 0.0680 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.072774 | 0.014688 | 4.954477 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 0.251196 | 1.023050 | 0.245536 | 0.8064 |
| INFLATION__GDP_DEFLATOR_ | 0.003584 | 0.060435 | 0.059309 | 0.9528 |

| | | | | |
|---|---|---|---|---|
| SECONDARY_SCHOOL_ENROLLM | 0.120333 | 0.040432 | 2.976210 | 0.0035 |
| GROSS_DOMESTIC_SAVINGS__ | 0.000458 | 0.059507 | 0.007701 | 0.9939 |
| | | | | |
| R-squared | 0.702184 | | | |
| Total panel (unbalanced) observations | 157 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -4.694695 | 36.04869 | -0.130232 | 0.8966 |
| BANK_OVERHEAD_COSTS_TO_T | -0.201710 | 0.332048 | -0.607474 | 0.5449 |
| STOCK_PRICE_VOLATILITY | 0.023460 | 0.016848 | 1.392471 | 0.1669 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.064251 | 0.018136 | 3.542658 | 0.0006 |
| LOG(GOVERNMENT_CONSUMPTION_E) | -0.246942 | 1.299530 | -0.190024 | 0.8497 |
| INFLATION__GDP_DEFLATOR_ | -0.053491 | 0.075635 | -0.707229 | 0.4811 |
| SECONDARY_SCHOOL_ENROLLM | 0.151283 | 0.051591 | 2.932341 | 0.0042 |
| GROSS_DOMESTIC_SAVINGS__ | 0.007755 | 0.072175 | 0.107443 | 0.9147 |
| | | | | |
| R-squared | 0.731250 | | | |
| Total panel (unbalanced) observations | 130 | | | |

## *8.4 Z-score*

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -76.09564 | 33.94299 | -2.241866 | 0.0279 |
| Z_SCORE | -0.092680 | 0.051014 | -1.816755 | 0.0732 |
| MARKET_CAPITALIZATION_EX | -0.065133 | 0.029010 | -2.245213 | 0.0277 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.057705 | 0.017176 | 3.359678 | 0.0012 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 2.731043 | 1.271884 | 2.147242 | 0.0350 |
| INFLATION__GDP_DEFLATOR_ | -0.008934 | 0.070949 | -0.125925 | 0.9001 |
| SECONDARY_SCHOOL_ENROLLM | -0.019468 | 0.055314 | -0.351952 | 0.7258 |
| GROSS_DOMESTIC_SAVINGS__ | 0.118890 | 0.090990 | 1.306631 | 0.1953 |
| | | | | |
| R-squared | 0.824924 | | | |
| Total panel (unbalanced) observations | 105 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -10.17041 | 27.75755 | -0.366402 | 0.7147 |
| Z_SCORE | -0.007900 | 0.047445 | -0.166505 | 0.8680 |
| MARKET_CAPITALIZATION_OF | -0.005045 | 0.006735 | -0.749073 | 0.4552 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.076241 | 0.015856 | 4.808388 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 0.030709 | 1.013782 | 0.030291 | 0.9759 |
| INFLATION__GDP_DEFLATOR_ | 0.006597 | 0.061533 | 0.107207 | 0.9148 |
| SECONDARY_SCHOOL_ENROLLM | 0.125654 | 0.040108 | 3.132930 | 0.0022 |

| | | | | |
|---|---|---|---|---|
| GROSS_DOMESTIC_SAVINGS__ | 0.013923 | 0.055301 | 0.251766 | 0.8016 |
| | | | | |
| R-squared | 0.695289 | | | |
| Total panel (unbalanced) observations | 157 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | 11.35762 | 28.57885 | 0.397413 | 0.6917 |
| Z_SCORE | -0.023789 | 0.046771 | -0.508625 | 0.6119 |
| STOCKS_TRADED__TOTAL_VAL | -0.007469 | 0.002966 | -2.517933 | 0.0131 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.085053 | 0.015425 | 5.514069 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | -0.775868 | 1.046484 | -0.741404 | 0.4599 |
| INFLATION__GDP_DEFLATOR_ | 0.018318 | 0.059998 | 0.305316 | 0.7606 |
| SECONDARY_SCHOOL_ENROLLM | 0.137847 | 0.039467 | 3.492740 | 0.0007 |
| GROSS_DOMESTIC_SAVINGS__ | 0.016301 | 0.054052 | 0.301583 | 0.7635 |
| | | | | |
| R-squared | 0.708799 | | | |
| Total panel (unbalanced) observations | 157 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -19.34619 | 27.51764 | -0.703047 | 0.4833 |
| Z_SCORE | 0.005844 | 0.047605 | 0.122754 | 0.9025 |
| STOCKS_TRADED__TURNOVER_ | 0.008462 | 0.004698 | 1.801052 | 0.0741 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.072942 | 0.014730 | 4.951983 | 0.0000 |
| LOG(GOVERNMENT_CONSUMPTION_E) | 0.347922 | 1.003483 | 0.346714 | 0.7294 |
| INFLATION__GDP_DEFLATOR_ | -0.000452 | 0.060957 | -0.007417 | 0.9941 |
| SECONDARY_SCHOOL_ENROLLM | 0.116308 | 0.039617 | 2.935843 | 0.0040 |
| GROSS_DOMESTIC_SAVINGS__ | 0.011027 | 0.054692 | 0.201627 | 0.8405 |
| | | | | |
| R-squared | 0.701713 | | | |
| Total panel (unbalanced) observations | 157 | | | |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | | | |
| C | -8.749613 | 35.02700 | -0.249796 | 0.8033 |
| Z_SCORE | -0.053996 | 0.053502 | -1.009238 | 0.3153 |
| STOCK_PRICE_VOLATILITY | 0.023118 | 0.016716 | 1.382996 | 0.1698 |
| TOTAL_FLOWS__IMPORT_EXPO | 0.063888 | 0.018070 | 3.535675 | 0.0006 |
| LOG(GOVERNMENT_CONSUMPTION_E) | -0.105596 | 1.270871 | -0.083090 | 0.9339 |
| INFLATION__GDP_DEFLATOR_ | -0.052732 | 0.075327 | -0.700034 | 0.4855 |
| SECONDARY_SCHOOL_ENROLLM | 0.150098 | 0.051067 | 2.939232 | 0.0041 |
| GROSS_DOMESTIC_SAVINGS__ | 0.023816 | 0.069305 | 0.343634 | 0.7318 |
| | | | | |
| R-squared | 0.732995 | | | |

| | | | | |
|---|---|---|---|---|
| Total panel (unbalanced) observations | 130 | | | |