

The influence of financial
markets and institutions on the
economical growth.
(The interest rate spread)

Chile and Taiwan

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ABSTRACT

The purpose of this thesis is to examine the role of financial markets and institutions on the economical growth of a developing country. The IRS (interest rate spread) is used as the main tool, to examine Chile and Taiwan regarding their economical growth between 1988 and 2007. The reason Taiwan and Chile have been chosen is due to vast differences in the geographical location, and even divergence in political and economical system of these countries.

The research method that has been chosen for this thesis is a quantitative method. The economic theory is mainly based on secondary data. The method of data presentation and analysis are mainly descriptive even though the layout of the thesis is more of an explanation research. The calculations are made with the statistical computer program SPSS. The results of the study are expressed mathematically and in sets of tables. In order to determine the correlation between IRS and macroeconomic factors and the correlation between IRS and Economy growth, the magnitude and trend of the IRS is analysed from 1988 to 2007. To test the hypothesis, the OLS regression and panel data model is used.

The theoretical part is the base of the empirical part. The theoretical part is needed in order to understand and later on analyze the results from research on Chile and Taiwan. Different aspects of economical growth are defined to make it easier to understand and follow the thesis thoroughly. The financial markets and institutions are discussed very shortly. To understand the growth theory, Solow growth model is discussed, which is one of the most important models concerning the economical growth.

The empirical part of the thesis is dealing with the test of IRS against some macro economical factors such as; costumer price index (CPI), Exchange Rate (EX), Export Volume (EXP) and Money Supply (MO) of two different countries; Taiwan and Chile. The study provides evidence of the correlation between interest rate spread and the macroeconomical factors. The result shows that the correlation between interest rate spread and the macroeconomics factors vary from country to country. This mainly depends on the difference in political situation, the different economic and political policies of various governments, the high inflation rates and the market structure of the countries. The value of the coefficients gives the magnitude of adjustment in the event that the systems move out of

equilibrium. It also provides some evidence that there is a significant relationship between interest rate spread and economical growth.

The test results show clearly that in order to gain a sustainable development and economical growth the financial markets must perform well.

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1. INTRODUCTION

In this section the background information of the thesis is mentioned as well as the problem formulation is explained. Later on the purpose and relevance of the study is discussed. Also some words about the scope and limitation of the study will be presented. This part of the study is finished off with the disposal of the thesis.

1.1. BACKGROUND

For decades the world's economy has grown in a massive scale, experiencing turbulences such as World War I, World War II and others, along the way. A comparison between today's economy and the economy of the 80-th, shows that most of the economical related figures has more than doubled during this time. It has been evidently proven that the world's economy has a growing development, despise the turbulences and down periods the world's economy has had. It is difficult to have an accurate comparison, but the best available evidence still suggests, that today's average real incomes (GDP) in the industrial countries have a growing process between 10 to 30 times larger than a century ago, and between 50 to 300 times larger than two centuries ago. The differences are often associated with large differences in nutrition, literacy rate, infant mortality, life expectancy etc (Romer, 2001). The difference in the standard of living can also be seen in the comparison between different countries, especially between industrialized countries and undeveloped countries.

Now adays, researchers have argued that countries with lower income levels grow faster than the industrial countries (Case, 1996). There have also been researches that different countries have different economic growth rate. One of the major economical subjects discussed all over the world have been the economic growth and the factors affecting it. There are many theories and models dealing with economic growth, but the heart of the growth theory is the Solow growth model. The Solow Growth model is the starting point for almost all the analysis of economic growth. Although there are several economic growth theories that differ slightly from Solow model, even those theories are best understood through the comparison with Solow model.

Beside the growth theory and the factors affecting it, financial institutions and markets play an important role in the economic growth of all countries. In order to promote economic growth and welfare in a country, the financial institutions and markets must function properly. The interest rate is a key variable in the financial system. The role of interest rate, as a monetary tool has become more prominent than before. The reason is because of its' ability to provide changes in monetary impulse to affect aggregated demand. (Chirwa and Mlachila, 2004). For a bank to continue to remain in business they are procuring a margin between average lending and average deposit interest rate (the interest rate spread) in the banking system. However, the magnitude of spread varies across the world. The interest rate spread, which is also related to the degree of efficiency of the financial sector, is an offshoot of a competitive environment (Jayaraman and Sharma, 2001). It reflects the banks additional cost of borrowing related to intermediation activities by linking borrowers with the ultimate fund to the lenders. The deposit from potential savers limits financing of potential borrowers which affects the investment opportunities and therefore the potential growth of the economy. Financial systems in developing countries normally exhibit significantly larger interest rate spread on average than in industrial countries which have been attributed to high operation cost, financial taxation and high inflation rate (Turtelboom, 1991). Therefore, banks and financial institutions play a key role in the efficiency allocation of resources and analysis of credit risk that make rapid growth possible.

1.2. PROBLEM FORMULATION

Theoretically, there is strong argument that different countries have different economic growth rate and the developing countries grow faster than the industrial countries.(Case, 1996) There are also arguments that high interest rate spread (IRS) is one of the major factors behind poor economic growth and development. The developing countries are characterized with high IRS. (Turtelboom, 1991)

The ordinary measurement of living standard of a country is GDP per capita. To the observer it may seem as an interesting phenomena with in developing countries, such as, a country having a lower GDP per capita in the beginning of the 20th century has significantly higher GDP per capita today than a country with a higher GDP per capita in the beginning of 20th century. This can be seen in table 1.1 which shows the contrast of the GDP per capita between Chile and Taiwan.

Table 1.1. GDP (in million \$) of Taiwan and Chile

Year	1912	1920	1930	1940	1950	1960	1970	1980	1990	2000
Chile	2656	2430	3143	3259	3821	4320	5293	5738	6402	10001
Taiwan	722	982	1099	1390	924	1492	2980	5869	9886	12214

Source: The World of Economy: Historical Statistics, 2004)

This makes it interesting because it is stated that; “*across continents and cultures, many poor countries do not grow fast enough to catch up with the richer countries*”. (Case, 1996) But, as the history shows, it can be done. Based on these conditions, the thesis faces with following research questions:

What are the factors responsible for these kind of economical behaviour?

As the main tool and an important financial key, does the significantly larger IRS (Interest Rate Spread) have significant impact on economic growth and development?

1.3. PURPOSE AND SIGNIFICANCE OF THE STUDY

The study will bring up different aspects of economical growth and specially the role of financial markets and institutions. The main subject regarding this empirical work is to study the economic growth of Chile and Taiwan between 1988 and 2007. The focus will be on the factors responsible for the significantly IRS and examine if IRS does have significant impact on economic growth and development.

There will also be some discussions about the different factors that affect economic growth including the Solow growth model. The purpose is to make the study easier to understand, and follow the main subject of the thesis; financial markets and institutions and their impact on economical growth of different countries. A comparison between two developing countries, Chile & Taiwan (although Taiwan is an industrialized country today) could also facilitate knowledge within economic growth.

1.4. SCOPE AND LIMITATION OF THE STUDY

An analysis of the correlation between IRS and economic growth is based on yearly data spanning from 1988 to 2007, as well as the data of macroeconomics factors, for Chile and Taiwan. This time period gives a fairly good trend analysis, however, references will be made to other area if the need arises. The limitations of this study include; time constraints, lack of data such as Bank income statements and balance sheets from the commercial banks under study. Brock and Franken (2002) advised that the spread constructed from Bank Income statement and balance sheet is not the same as the spread constructed from disaggregated weighted lending and deposit rate.

1.5. DIPOSAL OF THE STUDY

This thesis consists of six chapters which are described in sequent below;

Chapter one is the introduction chapter. This section mentions the background information of our thesis as well as the problem formulation. Later the purpose and relevance of the study is discussed. Also some words about the scope and limitation of the study are presented. This part of the study is finished off with the disposal of the thesis.

Chapter two is the part of the thesis which exhibits the theoretical structure. First, the different point of view about the economic growth will be discussed. After that, a description of the importance of financial markets and institution will be preformed. An introduction of economic growth theory will be offered, as well as the Solow model theory.

Chapter three is the method part. This section has relevant information about the research method that has been chosen for this thesis. This will provide i.e. knowledge within how the data collection has been achieved. Sequentially, the method will be linked with the theoretical structure which will be the base for the empirical study of this thesis. Consecutively, the thesis will follow the model for data presentation and analysis, OLS regression and panel data model.

Chapter four is the empirical study chapter. This section will have the presentation of the two different cases: Chile and Taiwan. There will be an economical background presented for

both countries. Where, inflation, unemployment and foreign trade of these countries, are included in the background.

Chapter five analyzes the obtained data from these two cases. The results from the statistical test of significance and evaluation of the working hypothesis/discussion implication will be presented and analyzed in this section.

The last chapter, chapter six, covers the conclusion of the study.

2. THEORETICAL STRUCTURE

First, a description of the importance of financial markets and institution will be preformed. Later on, a discussion will be made concerning the different economic views regarding the economical growth. Different aspects of economic growth will be offered, as well as the Solow model theory.

2.1. THE ROLE AND DIFFERENT FORMS OF FINANCIAL MARKETS AND INSTITUTION

Financial institutions play an important role in the economic growth of all countries. In order to promote economic growth and welfare in a country, the financial markets and institutions must function properly. Although different economists have different view regarding the importance of financial institutions in economical growth of a nation, still financial markets and institutions are considered as backbone of the economy (Miskin & Eakins 2007).

Financial institutions are what make financial markets work and function properly. Without financial institutions the financial markets would be unable to function properly and thus generate economic growth. Discussing the financial markets and institutions, the role and importance of money must be studied.

In a new classical framework, it is established that the real money stock is an important input in the aggregate production function. The importance is due to that money is assumed to release capital and labor from the distribution and exchange process of goods and services allowing them to be more effectively used in the production process. However, the empirical literature is less clear on money as a significant input in the production process. Conclusions in the empirical literature are that the output elasticity of the money is negligible in the developed economies where the experience from transition economies is neglected. (Maneschiöld, 2006).

In McKinnon (1973) and Shaw (1973) it is argued that the financial system is a key determinant of economic growth particularly in developing countries where those countries are often characterized by fragmented and embryonic capital markets. It is even argued that to increase the efficiency in the financial markets and enhance the economic growth potential,

policies for financial stability as well as for price stability should be implemented. Increased financial stability will increase the credibility of the financial markets and the use of those markets in channeling financial capital in a more efficient way. Implementing price stability can enhance the growth potential as higher inflation can lead to lower demand for real money balances due to higher expected price levels as a consequence of increased uncertainty.

The central bank is like an arm of the government, being considered as the most important financial institution; however the level of independence from the government varies in different countries. In countries like Germany, Switzerland and USA it's high, but in Britain, Italy, Portugal and Spain much lower. (Miskin & Eakins, 2003) The European central bank has also been granted considerable independence from the governments. Central banks most important function is conducting monetary policy, which involves the management of interest rates and the quality of money, also referred to as money supply. Because monetary policy affects the interest rates, inflation and business cycle, all of which have a major impact on financial institutions and markets, and thus play an important role in the economy of a country.

Aside from the central bank there are several other financial institutions which play key part in financial economy of a country. They are banks, insurance companies, mutual funds, financial companies and investment banks, which are heavily regulated by the government in many countries. The interactions between these markets however take place through financial intermediaries. Financial intermediaries are defined as other institutions that act as a link between those who have the money to lend and those who have productive investment opportunities and are willing to borrow. When it comes to financial intermediaries' banks are considered to be the most important organ. Banks are financial institutions which accept deposit and makes loan. Banks are firms such as commercial banks, saving and loan associations, mutual savings banks and credit unions. Although banks are the most important financial intermediaries involving everyday activities in the life of average person, we must not forget the importance of other intermediaries which were mentioned before.

2.2. FINANCIAL MARKETS AND MONETARY POLICY

Monetary policy is one of the two principal means (the other being fiscal policy) by which government authorities in a market economy regularly influence the pace and direction of the overall economic activity, importantly including not only the level of aggregate output and employment but also the general rate at which prices rise or fall(Friedman, 2000).

In the academic literature, the six basic goals of monetary policy are (1) high employment, (2) economic growth, (3) price stability, (4) interest rate stability, (5) stability of financial markets, and (6) stability in foreign exchange markets (Miskin & Eakins, 2000).

The details of how modern central banks control the supply of money and thus effecting prices are quite complicated and display country specific differences. By affecting money supply, it is authorized that monetary policy can establish ranges for inflation, unemployment, interest rates and economic growth. In the short run monetary policy affects output.

An increase in the money leads to a decrease in interest rates and depreciation of currency. Further this will lead to an increase in the demand for goods and an increase in output. In the medium run and long run, monetary policy is quite neutral; changes in the level of money eventually lead to proportional increase in prices, leaving output and unemployment unaffected. Changes in the money growth will lead to corresponding change in the inflation rate.

The neutrality of money does not imply that monetary policy cannot or should not be used; an expansionary monetary policy can help the economy move out of the recession and return faster to its neutral level. But it is a warning that monetary policy cannot sustain higher output forever (Krugman, 2003). It can take quite a long time for a monetary policy action to affect the economy and inflation. The above arguments show the importance of money, monetary policy and further on the importance of financial markets and institutions dealing with the economic growth within a country.

In the light of these facts indeed, well functioning markets are the key-factors in producing high economic growth. The secret behind the success of powerful economies in the world are the well functioning financial markets and institutions of those economies. (Miskin & Eakins, 2003). On the other hand poorly performing financial markets and institutions are the reason that many countries in the world remain desperately poor. However we should have in mind

that activities in the financial markets have also a direct affect on individual wealth, the behavior of business and consumers and thus cyclical performance of the economy.

2.3. STRUCTURE OF FINANCIAL MARKETS

Discussing financial markets and institutions leads us to the structure of financial markets. It is important to know the structure of the financial markets in order to understand the function of financial markets thoroughly.

Financial markets are often categorized in several sub-markets. Following descriptions of several categorizations of financial markets illustrate essential feature of these markets (Eiteman, Stonehill & Moffet, 2007).

Debt and equity market; Debt and equity market play an important role in the daily life of individuals and firms. Individuals and firms obtain funds in financial debt and equity market in two ways.

The most common method is to issue a debt instrument such as a bond or mortgage, which is a contractual agreement by the borrower to pay the holder of the instrument a fixed amount at regular intervals until a specified date (date of maturity), when a final payment is made.

The duration of debt maturity varies between different kinds of bonds.

The second method of raising funds is by issuing equities, such as common stocks which are claims to a share in the net income and assets of a business. Stock holders are paid dividend under the prosperous period of a firm (Eiteman, Stonehill & Moffet, 2007).

Primary and secondary market; A primary market is a financial market in which new issues of security, such as a bond or stocks, are sold to individuals by the firms and government.

A secondary market is a financial market in which securities are sold between people or firms as second hands. Secondary markets can be categorized further into exchange markets, where buyer and sellers of securities meet in one central place to do business. Foreign exchange market which is an important part of financial market is of an undeniable importance for the economy of a country. In the foreign exchange market, people trade one county's currency for the currency for another country. Such transaction are needed whenever households, firms or governments want to acquire something from the rest of the world, something for which they must pay in the currency other than the one in which they receive their revenue. The

other form of organizing a secondary market is to have an over-the-counter market, in which dealers at different locations have an inventory of securities to buy or sell.

Money and capital markets; The money market is a financial market in which only short-term debt instruments are traded, while in the capital market long –term securities are traded. The side of the economy which is related to macroeconomic helps us understand the role and structure of financial markets. Macroeconomics focuses on four groups; households and firms (the private sector), government (the public sector), and the rest of the world (international sector).

These four groups stand for the entire economy of a country. They interact in different ways, many involving either receipt or payment of income. The markets in which they interact are Good markets, Labor markets, and Money market and Foreign exchange markets.

2.4. A BRIEF REVIEW ON DIFFERENT VIEW'S OF ECONOMY GROWTH

Economic growth is one of the most controversial topics and the basis of many debates in modern economy. Economic growth is defined as an increase in the total output of an economy, usually an increase in the real GDP per capita (Burda & Wyploz, 2005). Studying economic growth, leads us to many questions such as why some countries are rich while other are poor? Why the income levels differ so much in different countries? Why some countries continue developing over time, while other not? Such questions leads to further study and discussion of economic growth and factors affecting it.

Many economists have over many centuries approached to find the source of economic growth and the factors affecting it. The issue has been highly complex and economists have not been able to find all the factors, which are involved in economic growth, but some key factors have been identified overtime. Economic growth arises from many sources, the two most important key factors; over the years have been the accumulation of capital and technological advances. Poor countries have the lack of capital, which is essential for economic growth. These countries need to build communication networks and transport systems, which are very important in developing functioning industries. Capital goods are even important for developing agricultural sector of the country. (Romer, 2001)

Capital goods are produced by sacrificing the consumer goods. Consumer goods must even be sacrificed in order to achieve high technological advances. When a large part of a country's population is poor, taking resources out of the production for consumer goods in order to produce capital goods or to achieve technological advances through the research is a very difficult task.

Resource endowment is another key factor playing important role in economic growth. The ability of a country to produce goods and services depends mostly on the quantity and quality of its resources. Land, labour and capital are the most important resources involved in production process.

Micro economical aspect; the consumers wants and needs change over time and the new technology comes forward which results into new production techniques. The effective allocation of resources from one sector to another sector in order to maximize the usage of resources is an important micro economical aspect that often leads to higher competitiveness and higher growth.

Macro economical aspect; liberalised free trade where there are no tariffs, quotas or exchange controls are macro economical aspects which often contributes to specialization and higher growth in an economy. The stability of the currency through low inflation can also be mentioned as an important macro economical aspect.

Financial aspect; beside micro economical and macro economical aspects, the financial institutions play an important role in economic growth of a country. Economists have different views and opinions regarding the importance of the financial system for economic growth. A liberalized and efficient financial sector is important and essential for promoting economic growth and welfare. The process of financial liberalization through elimination of distortion and segmentation of financial market improves the process of the mobilization of saving as well as the efficiency of investments, and thus resulting in acceleration of overall growth rate of the economy. (Debraj, 1998).

Non-economical aspect; beside the economical system there is even a non-economical system is of importance dealing with economic growth. A fully functioning market system requires the right social, institutional, legal, and cultural conditions. The possible economic growth of a country depends mostly on its size, population, national resources, technology

growth and the human capital. Economic growth can be measured in several ways but the economists focus mainly on factors that improve GDP and GDP per capita. The GDP can be measured in two ways;

- How many finished goods and services that are produced within a year in a country?
- What we do with the total output, invest or consume?

$$\text{GDP} = C + I + G + \text{EX} - \text{IM} \quad (1)$$

Production process requires inputs such as capital and labor. The production process a country chose depends mostly on the level of the country's technological advancement and the effectiveness of the labor force. Higher production leads to higher wages and thus higher standard of living. The income is either saved, or consumed. Further, the savings are used as investment. However, savings does not guarantee long-term growth because capital depreciates. Saving and investment opportunities can improve by attracting foreign investors. Growth gives more choice and more leisure time. Those who are negative toward growth say that growth is negative concerning the environment and natural resources.

As mentioned before, output is increased either by adding more capital or labor. If the labor is hold constant and we increase the capital, the marginal productivity will rise but not proportionally, which is known as the diminishing marginal productivity. However, if labor increases as well as capital then we will experience constant, increasing or decreasing returns to scale.

The Solow model takes the following variables in account concerning the growth theory; capital accumulation, population growth and technological progress. Capital itself cannot sustain growth because of diminishing marginal productivity. Population growth itself cannot be considered as an important variable regarding the growth theory. Technological progress is the main key to economic growth (Burda & Wyplosz, 2005)

2.5. FACTORS BEHIND ECONOMIC GROWTH

The factors behind the economic growth are one of the most fundamental issues in economics, and the literature on the subject is extensive. The latest empirical studies on growth have got

inspiration not from new growth theories but rather from old neo-classical theories. The Solow model (1956) was built on two factors, capital and labour. Diminishing returns to capital means that all countries converge in the long run to a steady state level. Depending on the propensity to save and the production function in the country where the steady state level will end up. Expanding the Solow model by including human capital as education and health we might reach a model that has the possibility to say something about the real world. Mankiw, Romer & Weil (1992) developed an augmented version of the Solow model that could be useful when analysing developing countries. Economic growth is dependent on the accumulation of human and physical capital, technological progress and the propensity to save. The GDP per capita income level in the long run is determined by the level of human and physical capital and the productivity in the aggregate production function. Differences in production functions explain differences in per capita income. (Hejdra, Van Der Ploeg 2003). To analyse if initial inequality gives a lower growth rate or not, the key factor to determine that is the level of savings. Savings and investments are important factors contributing to economic growth. Bigsten & Levin (2000) concluded that growth in the industrial sector is more important for the growth rate, while growth in the agriculture sector is more important for increased employment and poverty reduction. The impact of education on economic growth deserves some special space within the scope of factors determining the growth rate, as one of the main channels through which inequality affects growth. According to Barro (1997), the long-run growth rate depends upon the action of the government in the field of taxes, laws, infrastructure, international trade and the financial markets among several factors, thus the government has a role in affecting in the long-term rate of growth.

2.6. GROWTH THEORY

In order to understand economic growth, one must understand growth theory. Growth theory is defined as a process that explains why a country has the capital stock it has and why it produces the outputs, it does (Case, Fair, Gärtner, Heather, 1999).

The most important key feature to explain and understand economic growth theory is aggregate production function. Aggregate production function is defined as “the mathematical representation of the relationship between inputs and national outputs (gross domestic product)” (Case, Fair, Gärtner, Heather, 1999). It is known that the production

function is the link between the total output produced in an economy and the factors used in the production process.

2.7. THE NEW GROWTH THEORY

Human capital; is the economic value that is derived from the actual application of knowledge, collaboration, and process-engagement. From this point of view, human capital is regarded as the source form which decisions relating to service, quality, effectiveness, efficiency, and productivity are generated. Education and training are viewed as the most important investments in human capita.

Human capital is also defined as skills and abilities of the labor used in production. Many early economic theories refer to it simply as labor, one of three factors of production, and consider it to be a commodity homogeneous and easily interchangeable. However, other conceptions of labor are more sophisticated.

There are enormous differences between human capital in rich and poor countries. Rich countries not only have access to a large stock of physical capital, but by investing time and money in education, it is also possible for these countries to produce a large stock of human capital. As mentioned earlier *human capital* is defined as labor that are skilled, labor that can operate sophisticated machinery, labor that can create new ideas and new methods for a more effective production. Thus there is a very big difference between skilled and unskilled labors (Becker Garry S, 1975).

Technical progress; is defined as a technological change that increases output for any given input. As mentioned earlier in this thesis technical progress plays an important role in the production process and thus the overall growth of the economy (Becker Garry S, 1975).

Solow model declares that, all long run per capita growth is driven by technical progress, the rate at which the productivity factors of production increases. According to Solow model, in the absence of technical progress a country cannot sustain per capita income growth indefinitely. In order to have any possibility of this to happen the capital must grow faster than the population, but in such as case, the hypothesis of diminishing returns implies that the marginal contribution of capital to output must decline, which eventually forces a decline in the growth rate of output and therefore of capital. (Romer, 2001)

2.8. INTERNATIONAL TRADE AND EXPORT PROMOTION

International free trade has potential benefit for all nations. In one sense, the theory of comparative advantages is the case of free trade.

David Ricardo first proposed the theory of comparative advantages in the 19th century. The main feature of the theory is that specialization and free trade will benefit all trading partners, even those that may be less efficient producers in the absolute sense.

During the last decades, the export promotion has become one of the most controversial topics regarding its affects on the economical growth. Export promotion theory suggests that, encouraging export has some beneficial influence on the economic activity. These can emerge directly through an increase in production of goods for export. As a result, the export sector will be forced to perform highly productive, re-allocating resources in the economy in order to be able to compete internationally (Debraj, 1998).

The hypothesis that the promotion of export boosts a nation's economic growth is known as the export-led growth hypothesis. A different hypothesis, namely growth-driven export hypothesis, suggests that the growth in export causes the economic growth in a country (Debraj, 1998).

2.9. GENERAL INFORMATION OF THE SOLOW MODEL

Robert Solow developed a theory for measuring the main factors in economic growth. His starting point is the production function:

$$Y = T * F (K, L,) \quad (2)$$

Showing output (Y) as a function of the capital stock (K), of labour input (L). The technological factor (T) is assumed exogenous in this model (Burda & Wyplosz, 2005).

The Solow model explains the long-run equilibrium levels of the capital stock and income, and, how the economy approaches this equilibrium. The Solow model studies a situation where the per capita availability of capital in the economy changes with the capital output

ratio. The change is driven by the postulate of diminishing returns, so that a higher per capita stock raises the capital output ratio (Burda & Wyplosz, 2005).

The Solow model focuses mainly on four variables; output (Y), capital (K), labour (L) and knowledge or the labour affectivity, denoted as A. Thus, the production function takes the form:

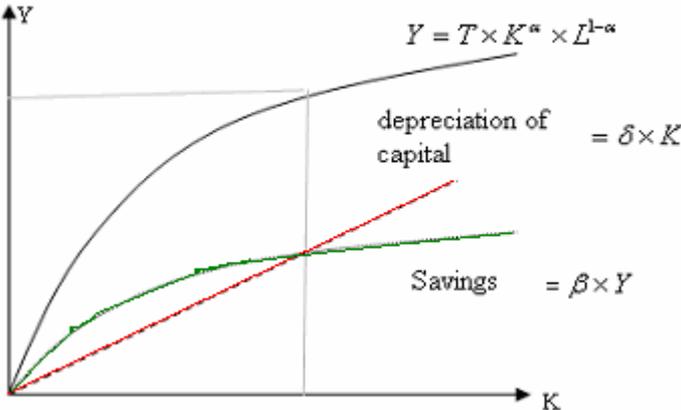
$$Y(t) = F(K(t), A(t)L(t)) \tag{3}$$

Where (t) denotes the time.

Because of more labour productivity in the economy, the total GDP increases. This will have another impact on the GDP/L though. The GDP/L implies that the total GDP is divided with the total amount of labour. This explains further that the more labour in the economy; the effect of an increasing GDP will have a less increasing effect in terms of GDP/L (Burda & Wyplosz, 2005).

The equilibrium K/L ratio depends upon the inflow and outflow of new capital per worker. The investment is the inflow. The outflow is the depreciation-breakdown with use that has to be replaced or repaired. The inflow and outflow are balanced is the equilibrium. Capital rises up to the point where the K/L ratio reaches its equilibrium value and stops, unless something changes (Burda & Wyplosz, 2005).

Graph 1: The Solow model



Source: Burda & Wyplosz, 2005

The upper line shows how the production per capita depends on the capital. The red line shows that depreciation is proportional to capital. The green line shows how much of the production that is saved or invested in capital. Where the two lines met is the equilibrium, it shows that the depreciated amount is the same as the invested in new capital.

2.10. THE SOLOW MODEL

In 1956, Solow argued that we should assume that a standard neoclassical production function with decreasing return to capital is the beginning of studying economical growth. The rates of saving and population growth were taken as exogenous and these two variables determined the steady state level of income per capita. Naturally the saving rates and population growth varies across countries which leads to different steady states. These variables can influence a country in different ways. The more a country saves, the richer it gets, and the more a country's population grow the poorer the country gets holding all other variables constant. When the data was tested, it showed that the Solow model is right. The model shows in what way the saving rates and population growth affect the level of income but it does not show by how much. In the Solow model, the two variables affect income too much compared to the reality. The Solow textbook model cannot explain why this happens so accumulation of human and physical capital is introduced into the model. The elimination of human capital in the textbook model can explain this problem with the help of two reasons;

- It does not matter how large the human capital accumulation rate is, if the saving rate is high and population growth low, the income level and human capital level will be higher. When the accumulation of human capital is included, the accumulation of physical capital and population growth has a larger impact on growth.
- If human capital accumulation is linked with saving rates and population growth rates then this will affect the estimated coefficients on saving and population growth.

To be able to test the augmented Solow model a proxy is included for human capital accumulation as an additional descriptive variable in the cross-country regression.

The test showed that the saving and population growth is linked with the accumulation of human capital.

Human capital accumulation is included in the model in order to lower the effects of savings and population growth to values that were predicted by the Solow model. 80 % of cross-country variations in income are accounted by the augmented Solow model. The augmented model can almost explain why some countries are rich while others are poor.

Many countries fail in converging in per capita income. The Solow model does not expect convergence but predicts that countries reach different steady states. Convergence is at the rate that the model predicts when differences in saving and population growth are accounted for. The last thing that the model looks at is international variations in rates of return and capital movements. According to the model, poor countries should have higher rates of return to physical and human capital than rich countries.

Many economists would like to dismiss the Solow growth model and use endogenous growth models, which believe in constant or increasing returns to scale in capital. However, by using decreasing returns to scale a lot can be explained in the cross-country variations in income as the Solow model argues. The Solow model is not a total model when explaining growth because it takes saving, population growth and technology change as exogenous.

The model argues that the endogenous models explain the worldwide technological change; however, the Solow model gives the right answers to the questions it is concerned about.

In the Solow model, the growth of income is a function of the determinants of the ultimate steady state and the initial level of income. The prediction about convergence among countries productions is different in the Solow model and Endogenous growth model. The Endogenous growth model does not have a steady-state level of income because the income per capita in different countries can be persisted indefinitely, even if they have same saving rates and production growth. The Endogenous models with a single factor $Y = AK$ predict no convergence. However, according to Barro (1989) if the Endogenous models have more than one sector, it implies convergence if the initial income country is correlated with the degree of differences among sectors. (The Quarterly Journal of Economics, 1992)

3. METHOD

This section has relevant information about the research method that has been chosen for this thesis. This will provide i.e. knowledge within how the data collection has been achieved. Sequentially, the method will be linked with the theoretical structure which will be the base for the empirical study of this thesis. Consecutively, the section will be followed by the model for data presentation and analysis, OLS regression and panel data model.

3.1. RESEARCH METHOD

Throughout the thesis an effort has been made to describe the different aspects of economic growth and the role and importance of financial markets and institutions regarding the economical growth in the developing countries. The research method that has been chosen for this thesis is a quantitative method. Quantitative research method is characterized having a special language which appears to exhibit some similarity to the ways in which scientists talk about how they investigate the natural order – variables, control measurement, experiment (Bryman, 1988). In relation of choosing a quantitative research, the investigator seeks knowledge through measurements, and with the result try to describe and explain the phenomena of reality. This implies that the researcher must be as objective as possible, neutralize the subjective segments and get objectiveness in the collected information. (Patel & Tebelius, 1987)

3.2. THE CHARACTERIZES OF THE RESEARCH METHOD

Studies are often based on the sought information. The research either can fall in the category of exploration, description or explanation. This thesis will fall in the category of explanation. An investigator, who is using explained research, firstly uses tools such as, statistical hypothesis theory, regression theory and multi-variance analysis (Patel & Tebelius, 1978). Secondly, the purpose of an explained research is to bring up knowledge through theories and information that already been found out, especially from previous described studies. The investigator creates hypothesis from these described studies and puts it in an empirical study. (Befring, 1994)

The research can also be based on study area i.e. historical research, evaluation research and development studies. A development study is characterized by the changes over time research. (Patel & Tebelius, 1978) The empirical part of this thesis is dealing with the examination of the economical growth and the importance of financial markets and institutions regarding Chile and Taiwan between 1988 and 2007. Therefore, it can be said that this thesis will have the character of a developing study.

The thesis will also obtain two case studies, Chile and Taiwan. Case studies have the purpose to study process and changes. Further on, the investigator tries to find covering information of the problem, through a larger perspective. (Patel & Tebelius, 1978)

3.3. SOURCE OF DATA AND DATA PRESENTATION

The economic theory is mainly based on the studies from books, published articles and internet sites, dealing with economic subjects, that is tend to give a theoretical base for the analysis. These kind of information obtained is called secondary data (Eriksson, 1978). The method of data presentation and analysis are manly descriptive even though the layout of the thesis is more of an explanation research. The carculations are made with the statistical computer program SPSS. The results of the study are expressed mathematically and in sets of tables. In order to determinate the correlation between IRS and macroeconomic factors and the correlation between IRS and Economy growth, the magnitude and trend of the IRS is analysed from 1988 to 2007. To test the hypothesis, the OLS regression and panel data model were used.

3.4. SAMPLE SIZE

The main goal is to research and examine how important financial markets and institutions really are regarding the economical growth within Chile and Taiwan during the years 1988 to 2007. For this purpose, a time series data covering the mentioned period yearly is used. The annual data of IRS is tested against the annual data of costumer price index (CPI), Exchange Rate (EX), Export Volume (EXP) and Money Supply (MO). The chosen variables are due to the limitation of the thesis. The annual data was obtained from the database of International Monetary Fund (IMF). To determinate the correlation between IRS and Economy growth,

annual data of IRS and annual data GDP per capita 1988=100 deflated is used. To further cross-check the correlation between IRS and macroeconomic variables and between IRS and Economic growth, the statistic panel data model is used to the test the aggregated data from the two countries. This would give covering information of the problem. This would also make the study easier to follow, and a descriptive presentation of the data can be accomplished.

3.5. MODEL SPECIFICATION AND ESTIMATION

Due to the unavailability of commercial banks income statements and balance sheets of the countries under study, the empirical specifications of determinants of bank spreads, the independent variable have been based on the alternative method adopted by Chirwa and Mlachila (2004) and others. The most common measure of bank spread, which is the difference between estimated average annual lending rate and the estimated average annual deposit rate. Expressed mathematically;

$$IRS_t = LR_t - DR_t \quad (4)$$

Where, IRS_t = the interest rate spread, LR_t = estimated lending rate which is the interest rate received on loans giving out, and DR_t = estimated deposit rate which equally refer to the interest rate paid out on deposits. The log difference of the consumer price index was also used to represent inflation rate.

Let inflation rate by given by;

$$INF = (\text{Log } CPI_t - \text{Log } CPI_{t-1}) * 100 \quad (5)$$

Where, INF = Inflation rate and CPI = Consumer Price index

The model takes a many factor form as shown below:

$$IRS_t = \alpha_0 + \alpha_1 EX + \alpha_2 MO + \alpha_3 EXP + \alpha_4 INF + \varepsilon_t \quad (6)$$

Where, α_0 = Constant, IRS_t = Interest Rate Spread, EX = Exchange Rate, MO = Money Supply, EXP = Export Volume, INF = Inflation Rate and ε_t = is white noise error term. To have estimates for α_1 (beta) given the data collected, the following assumptions are made about the error term:

- The error term (ε_t) has zero mean value i.e. $E(\varepsilon_t) = 0$ for all t.
- Constant variance of the error term $\text{Var}(\varepsilon_t) = E(\varepsilon_t)$
- ε_t has a normal distribution for all t with mean zero i.e. $\varepsilon_t \sim N(0, \sigma^2)$

The panel data model equation is as below:

$$Y_{it} = \alpha_1 + \beta X_{it} + \varepsilon_{it} \quad (7)$$

Where, α_1 = Constant, β = Coefficient of the explanation variables, X = Explanation Variables, i = Countries, t = Time t, Y_{it} = Interest rate spread for country i at time t and ε_{it} = White noise.

By allowing the constant to vary across the countries, a fixed effect model is obtained. To equally determinate the correlation between interest rate spread (IRS) and economic growth, ordinary least square (OLS) and panel data model is used to test annual data of interest spread constructed from the difference between lending rate and deposit rate against annual gross domestic product growth (GDP_g) deflated (1988=100).

To obtain the economic growth in a country, a conversion of the data has to be made by using the formula below:

$$GDP_g = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \quad (8)$$

Where, GDP_g = Gross Domestic Product Growth, GDP_t = Gross Domestic Product at time t and GDP_{t-1} = Gross Domestic Product at time $t - 1$.

The model used is a single factor represented below:

$$GDP_g = \alpha_0 + \alpha_1 IRS + \varepsilon_{it} \quad (9)$$

Where, IRS = Interest Rate Spread and ε_{it} = White noise.

4. EMPIRICAL STUDY

This section will have the presentation of the two different cases: Chile and Taiwan. There will be an economical background presented for both countries. Where, inflation, unemployment and foreign trade of these countries, are included in the background.

4.1. TAIWAN'S ECONOMICAL BACKGROUND

Economists and politicians all over the world have observed the tremendous postwar development of Taiwan with wonder and amazement. Taiwan from being one of the poorest countries in the world with GDP per capita of less than 50\$ in 1950's, hyper-inflation and complete dependence on outside aid, being a poor agricultural country, has emerged as one of the strongest and richest industrial economies in the world today. Economists all over the world have been seeking the reason of this growth miracle throughout the decades. They have been trying to understand how this growth miracle has occurred and they ask themselves whether the experience is transferable, in whole or at least partly, and whether the economic miracle will continue or decline in a certain time period in future.

Taiwan long ago fully navigated its way through the necessary demographic transition, with population growth rates now so low that they are causing concern. The GDP per capita incomes soaring at sustained 7-9 percent annual rates over past three decades. (C. Deyo, 1992)

Taiwan has undergone a shift from agricultural to non-agricultural economic activities. It has reached a point where only 3-4 percent of GDP and only 10-12 percent of labour force employment are generated by agriculture. Taiwan's life expectancy at birth is currently about 76 years, higher than that of many developed countries. As a small country with a population of 23,036,087 (estimated in July 2006), Taiwan is today the twelfth largest trading country in the world and disposes over the third largest foreign exchange reserve. (Wniklar & Greenhalgh 1998)

4.1.1. THE ECONOMY

As mentioned before, Taiwan was until the twentieth century an agricultural economy. Its development was severely damaged by the Second World War. The Chinese Nationalists built up the economy with land reform and educational investment and set about

industrializing Taiwan. Growth was rapid, despite a slowdown in the early 1990s. Today, service industries such as finance are important. China has become Taiwan's largest export market and a large source of imports. The economic ties with the China are expanding all the time. Although Taiwan has small resources of coal and natural gas which can meet some of its energy needs and much has to be imported, still Taiwan has managed to become a leading industrialised economy. Today Taiwan is a leading supplier of electronic goods. There is also a motor vehicle industry. Other industries include petroleum refining, iron and steel, cement, machinery, chemicals, pharmaceuticals, textiles, food processing, fisheries and the production of wood and bamboo products. Aside from the industries, tourism is an important source of foreign currency. (C.Deyo , 1992)

Taiwan has a dynamic capitalist economy with gradually decreasing guidance of investment and foreign trade by the government. Slowly and gradually, most of the large government-owned banks and industrial firms are being privatized. During the past three decades the real growth in GDP has averaged about 8%. Exports have grown very fast, which is considered as a strong base for industrialization.

4.1.2. INFLATION AND UNEMPLOYMENT RATE IN TAIWAN

Inflation and unemployment are really low in Taiwan; the trade surplus is substantial; and has the third largest foreign reserves in the world. Agriculture contributes 3% to GDP, down from 35% in 1952. Traditional labor-intensive industries are steadily being moved off-shore and replaced with more capital- and technology-intensive industries. The Republic of China has become a major investor in Taiwan, Thailand, Indonesia, the Philippines, Malaysia, and Vietnam. The tightening of labor markets has led to an influx of foreign workers, both legal and illegal. Because of its conservative financial approach and its entrepreneurial strengths, Taiwan suffered little compared with many of its neighbors from the Asian financial crisis in 1997-1999. (Ranis, 1992)

4.1.3. FOREIGN TRADE

Foreign trade has been one of the most important features dealing with the rapid growth of Taiwan's economy during the past four decades. Since Taiwan is an export oriented economy, the trade openness is very important for the country's economy. Today Taiwan is considered as one of the largest suppliers of computer monitors and leading PC manufacturer, thus raw materials and capital goods accounts for more than 90 percent of country's total import. Since Taiwan imports most of its energy needs and raw materials, aside from China; United States is the second largest trading partner of Taiwan. Imports are estimated to be 16 percent from US and export is about 20 percent to US. Beside China and US, Japan is one of the most important trading partners of Taiwan. Together Japan and United States accounts for more than 40 percent of Taiwan's import and 56 percent of Taiwan's export goes to Japan. As most of the developed economies in the World Taiwan is now facing the same issues as lack of workers in the future since the population growth is very low in the country. Its future development will have to rely on future transformation to a high technology and service oriented economy. (Ranis, 1992)

4.2. CHILE'S ECONOMICAL BACKGROUND

Chile has pursued generally sound of economic policies for nearly three decades. The 1973-90 military government sold many state-owned companies. The three democratic governments since 1990 have continued privatization, though at a slower pace. The government's role in the economy is mostly limited to regulation, although the state continues to operate copper giant CODELCO and a few other enterprises (there is one state-run bank). Chile is strongly committed to free trade and has welcomed large amounts of foreign investment. Chile has signed free trade agreements (FTAs) with a whole network of countries, including an FTA with the United States, which was signed in 2003 and implemented in January 2004.

Since World War I, Chile has developed an industrial capacity to process its raw materials and to manufacture various consumer goods. The major products of its industries are copper and other minerals, processed food, transportation equipment, cement, textiles, iron and steel, paper, and chemicals. Chile's main imports are petroleum, wheat, capital goods, spare parts,

and raw materials. In addition to minerals, it also exports wood products, fish and fishmeal, fruits, and wine. The chief trading partners are the European Union nations, the United States, Japan, and Brazil. Chile became an associate member of Mercosur in 1996, and formally signed a free-trade pact with the United States in 2003.(<http://www.ne.se>)

4.2.1. THE ECONOMY

High domestic savings and investment rates helped propel Chile's economy to average growth rates of 8% during the 1990s. The privatized national pension system (AFP) has encouraged domestic investment and contributed to an estimated total domestic savings rate of approximately 21% of GDP. After a decade of impressive growth rates, Chile began to experience a moderate economic downturn in 1999, brought on by unfavorable global economic conditions related to the Asian financial crisis, which began in 1997. The Chilean economy finished 2004 with growth of 6.0%. Real GDP growth reached 5.7% in 2005 before falling back to 4.0% growth in 2006. Higher energy prices as well as lagging consumer demand were drags on the economy in 2006. Higher Chilean Government spending and favorable external conditions (including record copper prices for much of 2006) were not enough to offset these drags. For the first time in many years, Chilean economic growth in 2006 was among the weakest in Latin America.(<http://www.ddg.com/>)

Agriculture is the main occupation of about 15% of the population; it accounts for about 10% of the national wealth, and produces less than half of the domestic needs. The dependence of the economy on copper prices and the production of an adequate food supply are two of Chile's major economic problems. Wheat, potatoes, corn, beans, sugar beets, and fruit are the chief crops; a variety of vegetables, fruits, and grains are grown in the Vale of Chile, the country's primary agricultural area. The vineyards of the valley are the basis of Chile's wine industry. Livestock production includes beef and poultry. Sheep raising is the chief pastoral occupation, providing wool and meat for domestic use and for export. Fishing is also an important economic activity.(<http://www.economywatch.com/>)

4.2.2. INFLATION AND UNEMPLOYMENT RATE IN CHILE

Chile's independent Central Bank pursues an inflation target of between 2% and 4%. Inflation has not exceeded 5% since 1998. Chile registered an inflation rate of 3.2% in 2006. The Chilean peso's rapid appreciation against the U.S. dollar in recent years has helped dampen inflation. Most wage settlements and loans are indexed, reducing inflation's volatility.

Unemployment stubbornly hovered in the 8%-10% range after the start of the economic slowdown in 1999, well above the 5%-6% average for the 1990s. Unemployment finally dipped to 7.8% at the end of 2006, due largely to the fact that fewer Chileans were entering the workforce rather than to a substantial and sustained creation of new jobs. Most international observers place some of the blame for Chile's consistently high unemployment rate on complicated and restrictive labor laws. Wages have risen faster than inflation as a result of higher productivity, boosting national living standards. In 2006, according to statistics released by Chile's CAS Informática, around 58% of Chileans lived near or below poverty levels; 20.6% in extreme poverty. Despite enjoying a comparatively higher GDP and more robust economy compared to most other countries of Latin America, Chile also suffers from one of the most uneven distributions of wealth in the world. (<http://www.photius.com/>)

4.2.3. FOREIGN TRADE

Chile's economy is highly dependent on international trade. In 2006, exports increased to \$59.0 billion from \$40.5 billion in 2005, and imports increased to \$36.7 billion from \$30.2 billion the previous year. Exports accounted for about 42% of GDP. Chile has traditionally been dependent upon copper exports; the state-owned firm CODELCO is the world's largest copper-producing company.

2006 was a record year for Chilean trade. Total trade registered a 31% increase over 2005. During 2006, exports of goods and services totaled U.S. \$58 billion, an increase of 41%. This figure was somewhat distorted by the skyrocketing price of copper. In 2006, copper exports reached a historical high of U.S. \$33.3 billion. Imports totaled U.S. \$35 billion, an increase of 17% compared to the previous year. Chile thus recorded a positive trade balance of U.S. \$23 billion in 2006. Total trade with Europe also grew in 2006, expanding by 42%. The

Netherlands and Italy were Chile's main European trading partners. Total trade with Asia also grew significantly at nearly 31%. Trade with Korea and Japan grew significantly, but China remained Chile's most important trading partner in Asia. Chile's total trade with China reached U.S. \$8.8 billion in 2006, representing nearly 66% of the value of its trade relationship with Asia.

After growing for several years, imports were down in 1998 and 1999, reflecting reduced consumer demand and deferred investment. Imports have rebounded in 2000 and are up 19% over 1999; capital goods make up about 22% of total imports. The United States is Chile's largest-single supplier, supplying 18.5% of the country's imports in 2000, down from 21% in 1999. Chile unilaterally is lowering its across-the-board import tariff--for all countries with which it does not have a trade agreement--by a percentage point each year until it reaches 6% in 2003. Higher effective tariffs are charged only on imports of wheat, wheat flour, vegetable oils, and sugar as a result of a system of import price bands.

The main destinations for Chilean exports were the Americas (U.S. \$39 billion), Asia (U.S. \$27.8 billion) and Europe (U.S. \$22.2 billion). Seen as shares of Chile's export markets, 42% of exports went to the Americas, 30% to Asia and 24% to Europe. Within Chile's diversified network of trade relationships, its most important partner remained the United States. Total trade with the U.S. was U.S. \$14.8 billion in 2006. Since the U.S.-Chile Free Trade Agreement went into effect on January 1, 2004, U.S.-Chilean trade has increased by 154%. Internal Government of Chile figures show that even when factoring out inflation and the recent high price of copper, bilateral trade between the U.S. and Chile has grown over 60% since then. (<http://www.ne.se>)

4.2.4. FINANCE SECTOR

Chile's financial sector has grown quickly in recent years, with a banking reform law approved in 1997 that broadened the scope of permissible foreign activity for Chilean banks. The Chilean Government implemented a further liberalization of capital markets in 2001. Over the last ten years, Chileans have enjoyed the introduction of new financial tools such as home equity loans, currency futures and options, factoring, leasing, and debit cards. The introduction of these new products has also been accompanied by an increased use of

traditional instruments such as loans and credit cards. There are three main ways for Chilean firms to raise funds abroad: bank loans, issuance of bonds, and the selling of stocks on U.S. markets through American Depository Receipts (ADRs). Nearly all of the funds raised through these means go to finance domestic Chilean investment. The government is required by law to run a fiscal surplus of at least 1% of GDP. In 2006, the Government of Chile ran a surplus of \$11.3 billion, equal to almost 8% of GDP. The Government of Chile continues to pay down its foreign debt, with public debt only 3.9% of GDP at the end of 2006. (<http://www.ne.se>)

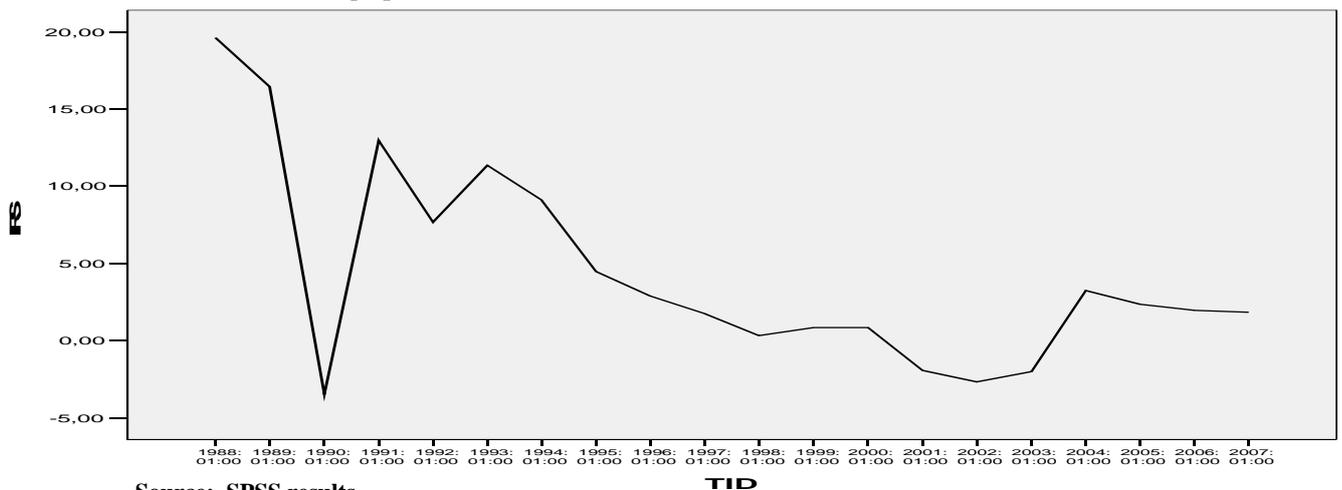
5. ANALYSIS

This chapter analyzes the obtained data from these two cases. The results from the statistical test of significance and evaluation of the working hypothesis/discussion implication will be presented and analyzed in this section.

5.1. INTEREST RATE SPREAD

Taking a general look at the interest rate spread for the two countries, where occasional upwards movement is discovered, but in general the movement was downward. The spread when compared to that of developed countries, for example Sweden and United Kingdom it was on the high side. The interest rate spread of Sweden and United Kingdom was just 0.5 to 2.0 percent while in one of the case countries the spread could reach as high as 20 percent.

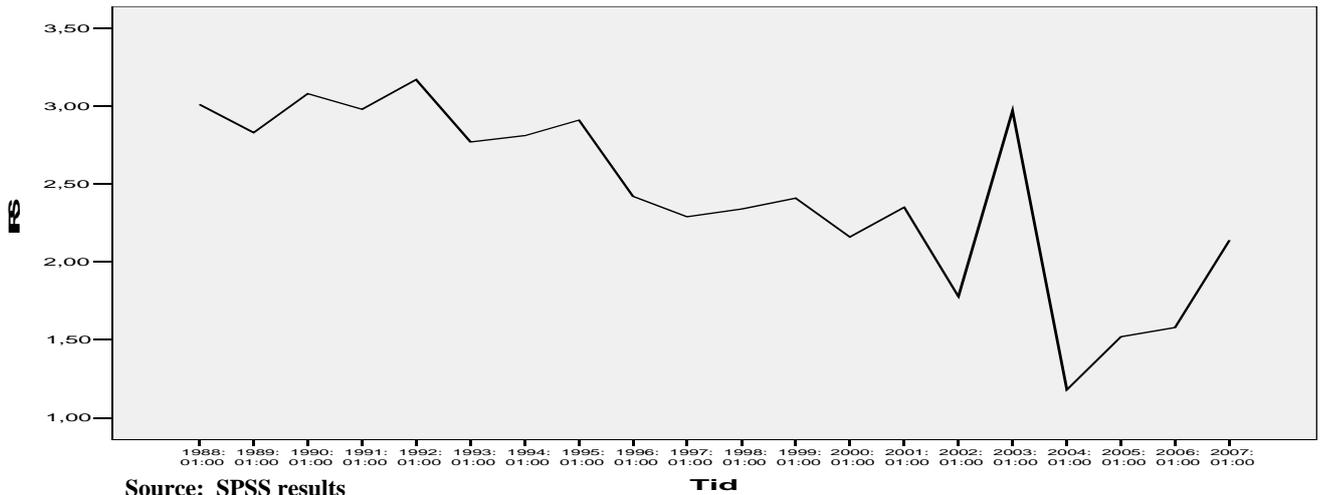
Table. 5.1. Sequence graph of Taiwan's IRS over time.



Source: SPSS results

Taiwan starts with a high interest rate spread, 19.62 percent in 1988 but from the figure above one can observe that in the year 2007 the spread dropped to 1,83 percent. As mentioned before, developing countries often have very high IRS compared to industrialized countries. The figure above is a perfect example that shows how Taiwan from being a developing country has emerged to be an industrialized country.

Table. 5.2. Sequence graph of Chile's IRS over time.



The figure above explains the economic development of Chile during 1988 to 2007. Chile had a more constant interest rate spread development than Taiwan. Chile started in 1988 with an interest rate spread of 3.01 percent and today has a spread of 2.68 percent. From this figure one can see that Chile has an IRS similar to an industrialized country although it is still considered as a developing country.

5.2. INTEREST RATE SPREAD AND MACROECONOMIC FACTORS

Interest rate spread (IRS) on the one hand (dependent variable) and the following macroeconomic factors; Export volume (EXP), Exchange rate (EX), Money supply (MO), Inflation (INF) on the other (independent variables) were tested to find out what kind of impact these variables have on each other using annual data from 1988 to 2007. This could be achieved by using ordinary least square (OLS) and panel data model, which can be seen in formula (6) and (7), respectively. The results of the study are expressed both mathematically and in sets of tables. Below are the sets of tables expressing the findings of the correlation between the interest rate spread and the chosen macroeconomic factors of each country using OLS.

Taiwan:

Table 1.3. Results of the OLS test for Taiwan:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10,200	3,805		2,681	,008
	Export	1,02E-05	,000	,752	5,557	,000
	Exchange Rate	-,007	,150	-,004	-,047	,963
	Money Supply	-1, 1E-06	,000	-1,359	-7,727	,000
	INF	,182	,273	,031	,667	,505

a Dependent Variable: IRS

Source: SPSS results

The case of Taiwan, as it can be seen in the result provided; the inflation does not have any impact on IRS due to low unemployment rate in the country. Neither the exchange rate has any impact on IRS, which can depend on the high degree of export. The estimation of these results, implementing the formula (6), at 10% significant level for p-probability value, that is 90% confidence interval, is expressed as following equation:

$$\text{IRS} = 10,200 + 0,0000102\text{EXP} - 0,0000011\text{MO} + \varepsilon \quad (10)$$

(0,008)
(0,000)
(0,000)

The equation implies that the interest rate spread in Taiwan is positively correlated to export volume and negatively correlated to money supply. Alternative, 1 percent increase in interest rate spread obtains a 0, 00000011 percent reduction in money supply and 0,0000102 percent increase in export volume. Or, stated positively, a reduction in interest rate spread 1 percent will lead to an increase in money supply and a reduction in export volume, with the same amount as previously mentioned.

Chile:

Table 1.4. Results of the OLS test for Chile:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,542	,182		13,992	,000
	Export	1,29E-05	,000	,282	1,538	,012
	Exchange Rate	-,001	,001	,140	1,051	,294
	Money Supply	-3,71E-05	,000	-,694	-2,594	,010
	INF	,263	,048	,351	5,466	,000

a Dependent Variable: IRS

Source: SPSS results

In the case of Chile the scenario is different. IRS is affected by export, money supply and even inflation. Similarly to Taiwan, the exchange rate does not have any impact on IRS, which can also depend on the high degree of export. The estimated equation of these results, implementing the formula (6), at 10% significant level for p-probability value, that is 90% confidence interval, can be seen below:

$$\text{IRS} = 2,542 + 0,0000129\text{EXP} - 0,0000376 \text{MO} + 0,263\text{INF} + \varepsilon \quad (11)$$

$$(0,000) \quad (0,012) \quad (0,010) \quad (0,000)$$

In the case of Chile, three of four economic variables tested have correlation with interest rate spread as shown above. Export volume and inflation are positively correlated while money supply is negatively correlated. The equation shows that 1 percent rise in interest rate spread increases export volume by 0,0000129 percent, increases inflation by 0,263 percent and decreases money supply by 0,0000376 percent.

Both countries Taiwan and Chile shows a positive significant correlation between Export and IRS. This mainly depends on the free trade policy that countries have, free trade generates more import and export.

Contrary to expectation, the result shows that the correlation between interest rate spread and the macroeconomics factors vary from country to country. This mainly depends on the difference in political situation, the different economic and political policies of various governments, the high inflation rates and the market structure of the countries. The value of the coefficients gives the magnitude of adjustment in the event that the systems move out of equilibrium.

5.3. INTEREST RATE SPREAD AND ECONOMIC GROWTH

Gross Domestic Product Growth (dependent variable) and interest rate spread (independent variable) are tested from 1988 to 2007, to find out if there is any correlation. Formula (9) is implemented in this part of the study. The result for both cases of studies can be seen below:

Table 1.5. The results of the IRS and GDP growth correlation test using OLS: Taiwan

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	296717,607	16959,290		17,496	,000
IRS	5002,905	1877,399	-,610	-2,665	,021

a Dependent Variable: GDP

Source: SPSS results

Table 1.6. Model Summary for Taiwan

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,725(a)	,526	,518	3,86441

Source: SPSS results

Table 1.7. The results of the IRS and GDP growth correlation test using OLS: Chile

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	318247,056	26329,485		12,087	,000
IRS	75655,768	9511,565	-,905	-7,954	,000

a Dependent Variable: GDP

Source: SPSS results

Table 1.7. Model Summary for Chile

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,602(a)	,363	,352	,45549

Source: SPSS results

The outcome of the test showed that there is a positive correlation between interest rate spread and economic growth for both countries, Taiwan and Chile. For Taiwan, the degree of correlation (R^2) is as high as 52.6 percent and for Chile 36.3 percent. The result of the panel data model implies that there is positive correlation between interest rate spread and economic growth in developing countries.

5.4. DISCUSSION OF FINDINGS

The findings of this study, regarding the relationship between IRS and economic growth, resulted positive to the expectations. A strong positive relationship exists between IRS and economic growth. Reason that could be advance for this may have been that despite the high lending rate charged by financial institutions, the investors were able to still take loan to finance high yielding investments that could still pay back the loan, thus increasing economic growth. This now leave us with another area for further research that is to what extent was the economic growth, the causal relationship between the IRS and economic growth. Another reason according to Emeuga (1999) may have been influenced then by forces outside the financial sector. The findings reveal that interest rate spread is an important factor in promoting economic growth in a developing economy.

There seems to be a positive relationship between IRS and inflation. The results supports the hypothesis that IRS may increase with rising inflation as financial institutions need more compensation for the risk and also for the reduction in the real value of their fund. Inflation increases nominal rate and reduces the real rate. It is in line with the findings of Chirwa and Mlachila (2004) in their study of financial reforms and IRS in the commercial banking system in Malawi. They observed that spreads increased significantly following liberalisation, and that high spreads can be attributed as to high monopoly power, high reserve requirements, high central bank discount rates, and high inflation.

There exist a significant negative relationship between IRS and money supply in the economy. This is because when there is large supply of loanable funds compare to the number of investors seeking business loans or credits, there will be competition among financial institutions jostling for clients, when this arises, and they will have no choice than to reduce their lending rate. Which subsequently causes the IRS to reduce or on the alternative when there is short supply of loanable funds compare to the number of investment opportunities available, financial institutions will tend to seize the opportunity to increase lending rates. This turn results in increased IRS.

The significant positive relationship between IRS and export volume could be attributed to the reason that as export volume increases more earnings for exporters in the form of foreign exchange. When this happens, exporters who desire to make more money by increasing their

production will approach institutions for loans and those who realise that export business is now booming may equally approach the bank for loan. Financial institutions knowing that there are more borrowers compare to the amount of money available for lending could result in using loan rationing in increased IRS.

This study shows that due to the various economic reform policies be adopted by the different governments of these countries, the imperfect loan markets and the different market structure, they all are affected differently by macroeconomic factors. This is in line with the work of Feder and Just (1980) and Nathan and Neave (1989).

6. CONCLUSION

This thesis deals mainly with financial markets and institutions and its role on the economic growth, in this case Chile and Taiwan. The IRS (interest rate spread) is used as the main tool, to examine Chile and Taiwan regarding their economical growth between 1988 and 2007.

The main reason Taiwan and Chile is been chosen is due to vast differences in the geographical location of the countries and even political and economical.

Economic growth is one of the most controversial and well-debated subjects among economists and politicians all over the world. Through out the thesis an effort has been made to discuss financial markets and institutions as well as the economic growth and the different factors that affect economic growth.

The Solow model is considered to be the heart of growth theory and the starting point of almost every economic discussion. The Solow model is discussed thoroughly throughout the paper in order to make it easier to understand the growth theory.

It is considered to be important to inform the reader about some flaws and weaknesses which might be seen in the paper. The time series during (1988-2007) have been used for empirical test mainly depends on difficulties being faced to obtain all the important information regarding the chosen variables. Since the economical growth and the role of financial markets in promoting economical growth is a very wide subject, it is almost impossible to cover all the aspects and discuss all the factors of importance, still the major effort has been made to mention and discuss the most important topics. In order to achieve a more concrete result one needs to examine more countries than only Taiwan and Chile, but unfortunately it has not been possible to perform the mentioned scenario due to length and time limitation concerning the thesis.

The study provides evidence of the correlation between interest rate spread and some macroeconomical factors such as; costumer price index (CPI), Exchange Rate (EX), Export Volume (EXP) and Money Supply (MO). The result shows that the correlation between interest rate spread and the macroeconomics factors vary from country to country. This mainly depends on the difference in political situation, the different economic and political policies of various goverments, the high inflation rates and the market structure of the

countries. It also provides some evidence that the interest rate spread and economic growth are significantly related.

The Governments of developing countries must try to make necessary infrastructures required to make some well functioning and effective financial system as an important tool for economic growth and to bring sustainable development forward.

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APPENDIX

GENERAL INFORMATION OF TAIWAN

GDP: Purchasing power parity-\$631.2 billion (estimated 2005)

GDP- real growth rate: 3.8 % (estimated 2005)

GDP-per capita: purchasing power parity-\$ 27600 (estimated 2005)

Agriculture: 1.6%, Industry: 2.9%, Services: 69% (estimated 2005)

Population below poverty line: 0.9 % (estimated 2005)

Household income/consumption by percentage: Lowest 6.7%, Highest 41%

Inflation rate (consumer prices): 2.3% (estimated 2005)

Labour force: 10.6 million (2005)

Labour force by occupation: Services 58.2%, Industry 35.8%, Agriculture 4-5%
(Estimated 2005)

Unemployment rate: 4.2% (estimated 2005)

Budget: Revenues: \$41.67 billion; Expenditures: \$50.26 billion, including capital expenditures of \$14.4 billion (estimated 2005)

Industries: Electronics, petroleum refining, armaments, chemicals, textiles, iron and steel, machinery, cement, food processing, vehicles, consumer products, pharmaceuticals etc.

Industrial production growth rate: 4.1% (estimated 2005)

Agriculture-products: rice, corn, vegetables, fruit, tea, pigs, poultry, beef, fish etc.

Exports: \$170 billion (estimated 2005)

Export-commodities: computer products and electrical equipment, metals, textiles, plastic and rubber products, chemicals etc.

Export-partners: China 21.6%, US 16.2%, Hong Kong 15.1%, Japan 7.7% (estimated 2005)

Imports: \$ 181.6 billion (estimated 2005)

Imports-commodities: machinery and electrical equipment 44.5%, minerals, precision instruments etc.

Import-partners: Japan 25.3%, US 11.6%, China 11%, South Korea 7.3% (estimated 2004)

Debt-external: \$81.64 billion (estimated 2005)

Currency: 1 New Taiwan Dollar (NT\$) = 100cents

Exchange rates: New Taiwan dollars per US dollar -31.71(2005) 29.67 (2006)

GENERAL INFORMATION OF CHILE

GDP: purchasing power parity - \$212.671 billion (2006)

GDP - real growth rate: 4.0% (2006)

GDP - per- capita: purchasing power parity - \$12,983 (2006)

GDP - composition by sector: agriculture: 6.2% industry: 32.5% services: 61.3% (2006)

Population below poverty line: 13%

Household income or consumption by percentage share: lowest 10%: 1.2% highest 10%: 47.0% (2005)

Inflation rate (consumer prices): 2.6% (2006)

Labour force: 6.2 million (2004 est.)

Labour force - by occupation: agriculture 13.6%, industry 23.4%, services 63% (2003 est.)

Unemployment rate: 8.0% (2006)

Budget: revenues: \$21.53 billion expenditures: \$19.95 billion, including capital expenditures of \$3.33 billion (2004 est.)

Industries: copper, other minerals, foodstuffs, fish processing, iron and steel, wood and wood products, transport equipment, cement, textiles

Industrial production growth rate: 7.8% (2004 est.)

Agriculture - products: wheat, corn, grapes, beans, sugar beets, potatoes, fruit; beef, poultry, wool; fish; timber

Exports: \$59.9 billion f.o.b. (2006)

Exports - commodities: copper, fish, fruits, paper and pulp, chemicals, wine

Exports - partners: U.S. 14%, Japan 11.4%, the People's Republic of China 9.9%, South Korea 5.5%, Netherlands 5.1%, Brazil 4.3%, Italy 4.1%, Mexico 4% (2004)

Imports: \$36.2 billion f.o.b. (2006)

Imports - commodities: consumer goods, chemicals, motor vehicles, fuels, electrical machinery, heavy industrial machinery, food

Imports - partners: Argentina 17%, U.S. 14.1%, Brazil 11.1%, the People's Republic of China 7.1% (2004)

Debt - external: \$43.3 billion (2004)

Currency: Chilean peso (CLP)

Exchange rates: Chilean pesos per U.S. dollar - 530.32 (2006), 559.75 (2005), 609.37 (2004), 691.43 (2003), 688.94 (2002), 634.94 (2001), 539.59 (2000)