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The Impact of Trade Openness on Gross Domestic Product

A study of the Asian Financial Crisis

Bachelor thesis in Economics

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Abstract

This bachelor thesis in economics examines the Asian financial crisis - its impact on the countries in the region and how well they recovered financially. The countries that are taken into consideration are Japan, Indonesia, South Korea, Philippines, Thailand, Malaysia and Singapore. The variables used to explain the implications of the crisis are GDP, trade openness, unemployment and current account.

Descriptive statistics show that the most closed economy that was affected by a current account reversal was also the hardest hit in terms of GDP. The statistics also show that all the countries under observation have recovered to their situation prior to the crisis in terms of GDP, but not in terms of the level of unemployment.

Two regressions that were performed showed the relation between trade openness and the effect of GDP after the crisis, and the relation of trade openness to growth after the crisis. The regressions show that the more closed an economy is the larger the effect of a crisis. At the same time these countries had the highest growth rates after the crisis and were also among the first to recover. Theoretical reasons for these results are given.

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1 Introduction

In today's modern history the most well known financial crisis of all time is the Wall Street crash of 1929 (Oxford reference, 2008). This financial crisis spread across to most economies around the world. Since then there has been a number of crises, amongst these are those in Russia, Latin America, South-East Asia and now recently the worldwide economic crisis. The frequency of financial crises seems to have been increasing during the last twenty years with major upsets in the economy across the world. The magnitude of each crisis has been altering in size with varying numbers of economies being affected, but one thing is for sure - a financial crisis never goes by unnoticed.

The term financial crisis is very broad and can be used in many situations. It is used when referring to a banking crisis, a recession, a stock market crash, a currency crisis and the bursting of a financial bubble. Thus it is not easy to define what a financial crisis entails. In the case of the Southeast Asian financial crisis it falls under the category of a currency crisis.

“A currency crisis occurs when investors flee from a currency en masse out of fear that it might be devalued. Currency crises are episodes characterized by sudden depreciations of the domestic currency, large losses of foreign exchange reserves of the central bank, and (or) sharp hikes in domestic interest rates.” (Kaminsky, 2008)

There are often many reasons to why a currency crisis occurs and how large the magnitude of the crisis is. In the case of Southeast Asia the economic situation for each country is generally very similar, with the economies built on the same principles. The macroeconomic policies of these countries were very similar and the countries are closely linked through trade. When the crisis hit, originating in Thailand, it immediately spread to many trade partners, a phenomena known as the contagion effect.

In general the Asian economies are viewed as being very open in terms of trade. The level of trade openness varies between the countries, some are more open than others. To a large degree these countries are very dependant on trade in their GDP. Does the level of openness thus have an impact on the countries in Asia when the crisis occurred?

A financial crisis changes the course of history and has a large impact on the personal lives of people. The way in which governments run their economies determines the stability of a country's economy, the economy of their people and to what magnitude the country will be affected.

1.1 Purpose

The Asian financial crisis affected a lot of economies in Asia as well as other economies across the world. The aim of this paper is to analyse what effect the openness of each economy had on the gross domestic product and how long time it took for each country to recover after the Asian financial crisis.

1.2 Outline

The rest of this paper is organized as follows. Section 2 gives a brief background to the Asian financial crisis and previous research on that particular crisis. Section 3 gives a theoretical base to the paper and the theory explaining the hypothesis. Section 4 consists of the

data collected and regression method, whilst section 5 is used to analyse this results. The last section 6 is the conclusion of the thesis, which is followed by a list of references.

2 Background

This section will provide information about the situation prior to the breakout of the financial crisis along with previous researches views on the cause of the crisis.

2.1 History

The Asian financial crisis originated with the fall of the Thai Baht on the 2nd of July 1997 (Montes, 1998). As a direct consequence a number of countries associated with Thailand were affected by this. As found throughout the reading, the countries that were most affected in the crisis were:

1. Thailand
2. Malaysia
3. Indonesia
4. Philippines
5. South Korea
6. Hong Kong

The fall of the Thai Baht was what triggered the actual crisis, but there are so many other factors that play in when the actual crisis broke out. The Southeast Asian economies had been experiencing a very positive economic climate since the beginning of the 1990's.

The interest rates overall in the Asian region were fairly high during the early 1990's up until the crisis hit in 1997. Thailand's interest rate ranged from 9.5% to 12.5% during 1989 to 1997, but by 1999 it had fallen to 4%. Other economies close to Thailand such as Indonesia were also experiencing very high interest rates ranging from 8.82% up to 20% in 1997. The Philippines had similar experiences whilst Malaysia and Korea were looking at more typical numbers around 5%. Due to the high levels of interest, a lot of investors saw the opportunity to invest and in turn get a high rate of return on their investments. This also increased the economic climate with a lot of money inflow to the region's economies (International Financial Statistics Yearbook, 2000).

There are many explanations to the cause of the Asian financial crisis, according to Montes (1998) the four main reasons where:

1. The Southeast Asian economies have their competitive advantage in low cost production. But with China and India emerging their competitive advantage was lost.
2. Ten years of current account deficit and weak macroeconomic policies
3. Banking sectors "undisciplined expansion and diversification in the domestic financial market" (p.1) all of which had been financed by the banks taking short-term loans
4. The contagion effect

The combination of these four factors is what caused the crisis to occur in general, but there are many other aspects that play a certain role.

In 1988 there was a repositioning of production from Japan, Korea and Taiwan over to the Southeast Asian economies. This was the start of an economic export boom that occurred in the 1990's, but that boom was expected to decrease with time. There were heavy capital inflows to these countries at the time which were putting pressure on their currencies. The labour intensive countries such as Thailand, Indonesia and the Philippines had to peg their

exchange rates to the USD so that they would not appreciate, otherwise they could lose their competitiveness in exports (Montes, 1998).

At the end of the day the economic policies and the decisions that were taken were not very well thought through or based on normal economic theory. Many decisions were taken because each country did not want to miss the opportunity to be able to grow and become a part of the world market. In the end the decisions that were taken failed them since they did not listen to the typical warning signs that the economy was in trouble.

2.2 Previous research

The Asian financial crisis is an event that has been widely discussed and researched among economists and there are many viewpoints on what occurred to cause the crisis. On the one hand it was the shift in market expectations and confidence that caused a financial distress. On the other hand it was due to economic structure and policies of the countries in the Southeast Asian region (Corsetti et al., 1999).

The following theories have been used to describe the general reasons towards why the Asian financial crisis occurred and spread, and these will be used in the empirical framework to explain the effect of the crisis on the current account along with the openness of the economies.

2.2.1 Moral Hazard

According to Corsetti et al. (1999) the root to the crisis was the form and situation that the corporate and financial sectors were encouraged to operate under. The governments constantly ignored the common warnings that would have otherwise made someone else think twice about their actions. Companies at the corporate level had constant political pressure to perform. They wanted to see continuously high economic growth rates in the corporate sector and thus they financed a lot of projects through subsidies or certain government policies. Even if firms in the corporate sector were not under any direct plan or subsidy from the government, their general business practice was very risk taking - almost any risk or cost was not large enough to deter them in their quest to achieve success.

The market and firms operated under the impression that the government would help them in the event of financial problems due to the government appearing to want to save them. To be able to cover for the rate of investments, the national banks of these economies had to borrow excessively from countries abroad so that they could provide for the lending at home. This is one very clear sign that shows that the economic policies performed are not correct. This form of economic behaviour is called Moral Hazard, which is defined by Krugman & Obstfeld (2006) as “The possibility that you will take less care to prevent an accident if you are insured against it.” (p. 591) A number of well known and respected economists such as Paul Krugman and Alan Greenspan have stressed that moral hazard is one of the main factors leading up to the crisis (Corsetti et Al, 1999).

But this is only the tip of the iceberg when it comes to the problems of the government policies and actions that have been implemented. There was a lack of supervision and regulation on the financial and banking sector activities, lack of qualified staff in regulation institutes, corrupt lending practices among many other aspects. At the end of the day all these aspects added up to the weakness of the financial system and finally the increased share of non-performing loans (Corsetti et Al, 1999).

2.2.2 Contagion

The theory of contagion can be applied to many parts of economics and many theories. But the exact theory of contagion is not agreed upon by all economists and thus there are many aspects of the theory.

Prior to the last ten to twenty years, contagion was mainly used when referring to spreading and contagiousness effect of various diseases (Claessens and Forbes, 2001). It is only just until recently that the use of the word contagion has come to use among economic theorists when it comes to explaining the movement of economic crisis. In relation to the Asian financial crisis contagion has been widely discussed and been put forward by many economists as one of the main reasons for the crisis appearing in so many countries' economies at the same time.

“Contagion, in general, refers to the spread of market disturbances from one country to the other which is observed through movements in financial prices such as exchange rates, stock prices and interest rates” (Park and Song, 2000, p. 202).

One of the first groups of economists to study the theory of contagion was Eichengreen, Rose and Wyplosz. After the currency crisis in Finland in 1992 they discussed the “contagious” effect of a currency crisis.

According to Glick and Rose (1999) there are two explanations to how and why contagion spreads between countries. One of the main reasons is that due to the macroeconomic or financial similarities between the affected countries. The other main reason is that a downfall in a country's currency gives the country a competitive advantage in the short run. The country's competitors in terms of trade will be at a comparative disadvantage, and the country that appears weakest is most likely to be next in the line to be hit. Furthermore Glick and Rose argue that a currency crisis will often tend to be concentrated regionally, due to trade being strongly negatively affected by distance between countries.

Claessens and Forbes (2001) also provide research on the issue of the Asian financial crisis and find a strong relationship between the crisis and the theory of contagion. The fact that the Asian financial markets are well integrated and deal with large amounts of trade between them shows that they are highly dependent on one another. Thus the more tightly linked countries are the larger the positive and negative spillover effects are on between their markets (Claessens and Forbes, 2001).

This aspect of trade and market linkage plays another role apart from just the financial and investment spillover. In this category there is also a presence of competitive devaluation. Through trade linkage, devaluation of the exchange rate reduces the export competitiveness of countries that compete in third markets during a crisis. Countries that have a pegged currency, like the majority of countries affected during the crisis, experience that this puts a greater pressure on their exports in comparison to those who have a floating currency (Claessens and Forbes, 2001).

The macroeconomics of a country prior to or during a financial crisis plays a large role in how widely it is affected by contagion. The way in which a government regulates its financial institutions also affects the investment decisions of the private sector. The countries that were most affected by the Asian financial crisis also had very similar macroeconomic situations. Thus with an outbreak of a financial crisis and one of these countries being affected, then the contagion effect is inevitable since they all have the same weaknesses (Park and Song, 2000).

The economic theorists that have discussed the theory of contagion have based their theories around two different models. The first model that was put forward in 1979 by Paul Krugman, discussing the balance of payments crisis. The other model was put forward by Obstfeld in 1986, viewing a currency crisis as the shifts between different monetary equilibriums in response to self-fulfilling speculative attacks (Glick and Rose, 1999).

3 Theory

In order to show the cause and effects of the Asian financial crisis and how it spread over Asia, the use of economic theory needs to be applied. Financial crisis is something which economic theorists have widely discussed and therefore there are many general theories on how and why a financial crisis occurs. The theory of trade openness explains the recovery and growth of each economy whilst the current account reversal theory is used to explain the magnitude of the drop in the GDP after the crisis.

3.1 The effect of trade openness on GDP

The theory of trade openness is a widely discussed subject and there are many theories on what effect it has on an economy. There are three categories of how open an economy can be, ranging from fully closed to partly open and then full openness. Thus it is hard to define how open a country is that deals with trade but has restrictions.

Another aspect of openness of trade is that certain economists claim that larger countries can afford to be closed, whilst the smaller countries almost have to stay open in order to grow. The small countries face incentives to have an open trade policy in order to benefit from the larger market's spending power. Thus the smaller countries are expected to be more open to trade (Alesina & Wacziarg, 1997).

Empirical growth studies have also shown that outward-oriented economies have higher growth rates in comparison to inward-oriented economies. Certain theorists believe that a country can be open by having favourable policy to exports but barriers to imports, whilst others believe a country is open when it is unbiased in its import/export policies. Recently openness of trade has been widely referred to as being free trade. Thus it is quite clear that the theory behind openness is very broad and is not agreed upon by all (Yanikkaya, 2003).

The determination of a country's openness is thus in accordance of how one views the aspect of trade openness. Certain theorists believe that enhanced free trade increases growth, whilst certain economists believe that protectionism will have a better effect. One of the main reasons for there not being a single theory or it being disputed is because one can not only use one single indicator to measure openness. This is due to there being many different aspects affecting trade (Edwards, 1998).

At the same time, the more open an economy is the larger is the possibility for it to be hit by an external shock, say a financial crisis. But at the same time these open countries have a benefit of their large export sectors, which will help them to reduce an external debt more easily than a closed economy. This is due to that the debt service absorbs a smaller part of the country's total export proceeds in comparison to a less open economy. With a reduced capital inflow, or it being interrupted, the country will have to alter the division of resources from the importing sector to exports, and this will generate the foreign exchange the country needs to cover for external debt. This in turn could have a negative effect on the domestic industries that rely on imported goods for their production, a so-called import compression. At the same time import compression could become even more costly to a relatively closed economy, due to the fact that certain essential inputs might be cut out (Milesi-Ferreti & Razin, 1996).

To conclude a more open economy allows a country to grow faster due to the use of its trade sector. At the same time the more open economy is more vulnerable to an external shock than a closed economy. In accordance with this a more closed economy will not grow as fast but is not as vulnerable to an external shock as an open economy. At the same

time if an external shock were to occur, the more open economy can handle this shock better due to the use of its trade sector.

3.2 Current account reversal

Edwards (2004) defines current account reversal as a decrease in the current account deficit by a minimum of 4% of GDP in a year. Such a reversal is often due to a so-called ‘sudden stop’, which is referred to as an abrupt stop in the inflow of capital to a country, which in the end is highly disruptive since this is mainly foreign capital. On the other hand there are cases of sudden stops without a reversal effect after. The countries that have managed to avoid this have used their international reserves to make adjustments in their current account. Moreover there is the opposite case, that there have been a reversals without a sudden stop, but these countries were not first experiencing large inflows of capital (Edwards, 2004).

Many economists argue that a high amount of capital mobility is extremely troublesome. If a country were to restrict the use of capital it could help prevent the probability that a country will suffer from a sudden stop and current account reversal. Others claim that sudden stops and current account reversals are inversely related to a country’s size of openness (Edwards, 2004).

Edwards uses a ‘treatment effects’ model to test what causes and to what degree, current account reversals as well as sudden stops. His findings indicate that a reversal is more likely to occur under a number of different circumstances such as a large current account deficits, low initial GDP and high occurrence of sudden stops in the region of that country. If a country has a high level of net international reserves then the probability of experiencing a reversal decreases. Furthermore Edwards finds that the effect of current account reversal on growth is highly dependent on trade openness of the economy (Edwards, 2004).

The level of trade openness will determine to what degree a country will be affected in terms of growth if a current reversal occurs. A current account reversal will always have a negative effect on a country’s GDP but the negative effect is dependent on openness. The more open an economy is the smaller the negative effect on GDP will be. This is because, according to Calvo et al. (2003) openness, which is viewed as large supply of tradable goods, reduces the leverage over the current account deficit. In accordance with this the more closed an economy is, the larger the negative effect of a reversal will be on GDP. Thus a more closed economy will be more affected than an open economy by a current account reversal. The reversal explains the magnitude of the drop after a reversal. Thus the larger the reversal is in magnitude of GDP the larger the negative effect on growth after (Edwards, 2004).

4 Empirical Framework

This section clarifies the method that will be used for the analysis and also explains the results that are expected during the Asian financial crisis.

4.1 Method and Hypothesis

The Asian financial crisis affected many countries in East Asia but in different magnitudes. The six countries listed previously and that were widely affected by the crisis were Thailand, Malaysia, Indonesia, Philippines, South Korea and Hong Kong. The aim is to see how the degree of trade openness of each country has affected the growth of GDP when the crisis hit. In order to put the magnitude of the crisis into perspective we will analyse to what degree each country was affected in terms of GDP after the crisis and how well they recovered.

In order to put these figures into perspective they are compared in relation to two countries that are in the Asian region but were not as widely hit by the crisis. The countries used in this case is one smaller economy and one of the world's largest economies: Singapore and Japan.

In order to measure the trade openness of each respective economy the following formula was used:

$$\text{Trade Openness} = \frac{(\text{Import} + \text{Export})}{\text{GDP}}$$

This shows the proportion of goods and services that are entering and leaving the country in terms of the gross domestic product. The theory and calculations of openness are widely discussed and there are many sides to it. This formula is the most used when it comes to showing the most clear and direct measurement of how open a country's trade policy is.

As for the aspect and measure of the current account the analyses are based on the level of the account prior to the crisis, using descriptive statistics on before and after to see if there are any special changes. The current account balance is usually defined simply as the demand for countries exports of goods and services minus their imports of goods and services. But the balance also includes net unilateral transfers of income. There are many factors that affect the balance but the two main determinants are the exchange rate as well as the domestic disposable income. (Krugman & Obstfeld, 2006)

To determine the effects of the crisis the use of two ordinary least square cross-sectional regressions is made. The first regression model is:

$$(1) \text{ Change from 1998 to 2005 in log GDP} = \beta_1 + \beta_2 \text{openness} + \varepsilon_1$$

where β_1 represents the intercept of the trend line, β_2 is the slope of the trend line, illustrating how the change in log GDP is dependent on the level of openness, and ε_1 is the error term. The second regression model is:

$$(2) \text{ log GDP growth after 1997} = \beta_1 + \beta_2 \text{openness average} + \varepsilon_1$$

for this regression β_1 represents the intercept of the trend line, β_2 is the slope of the trend line after 1997, illustrating how the change in log GDP growth is dependent on the average level of openness from 1998 to 2005, and ε_1 is the error term.

For regression (1) it is conducted once with all the countries and once excluding Japan. As for the second regression (2) it will follow the same procedure but this time excluding both Japan and Hong Kong. The reason for this is explained in the empirical results where it is relevant.

The growth rate shows one aspect to recovery, at the same time the levels of unemployment prior to and after is analysed to see if there are any apparent changes and if there is any pattern in the levels during the years. The use of descriptive statistics is used to analyse how the unemployment acts according to the crisis. Unemployment is bound to increase during a crisis and thus one can see if the numbers start to return to the initial level before 1997 and thus indicating a recovery.

The aim of the thesis is to see how the openness of an economy affects the economy through the gross domestic product growth rate after a financial crisis.

Certain theorists believe that the smaller the economy is the more open the economy will be in general. Smaller economies have to be open to benefit from trade to be able to grow faster and recover from an event of financial crisis. At the same time they will also be more vulnerable to an external shock in comparison to a relatively closed economy.

- **The hypothesis for regression (1)** is that the more open an economy is the more vulnerable it is to an external shock.
- **The hypothesis for regression (2)** is that the more open an economy is the faster it will recover after an external shock, than a more closed economy.

According to the theory on current accounts there is an expectation that there will be a current account reversal effect after a crisis. This is due to the private sector money drop causing the capital account to drop and in order to balance this, the current account will have to balance out the negative impact. Which means that if a current account is experiencing negative numbers in one year and there is a reduction of the current account deficit by 4% of GDP then there is a current account reversal. During these circumstances the smaller the degree of openness of a country, the larger will be the current accounts reversal negative effect on growth, causing a larger drop in the year of the crisis. If on the other hand the country is very open the negative effect will be smaller.

In accordance with the effect the crisis has on GDP there will be different levels of recovery required for each country. The countries that are most affected will be in larger need to recover faster than those who did not suffer by the same magnitude. At the same time the more open an economy is the faster they can recover due to the use of the more open trade sector, in comparison to the more closed economies.

5 Empirical Results

This section illustrates and explains how the countries were affected prior, during and after the financial crisis took place. The countries are separated into two different figures in certain sections, this is due to the viewing of the figure would be too crowded and misleading with all countries on one small graph. Also note the difference in the scales of the figures when making interpretations.

5.1 Unemployment

In order to see how the financial crisis affected each respective country a measure that can be observed is the rate of unemployment of each country before and after the crisis hit. Below there are two figures (5.1.1 and 5.1.2) representing the level of unemployment in each country from the years shortly prior to the crash until year 2005 after the crisis hit.

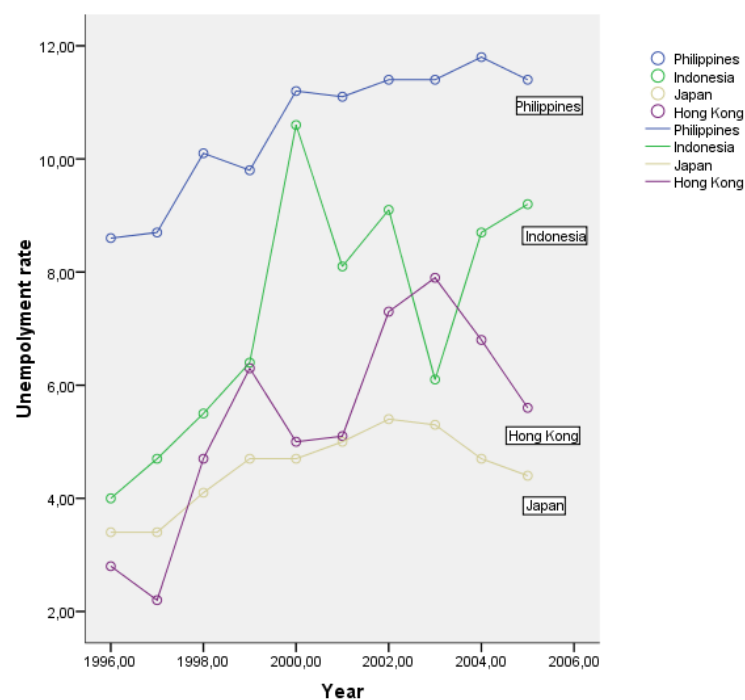


Figure 5.1.1 **Unemployment after 1995**

Source: IMF financial statistics yearbook

Prior to the break-out of the crisis in 1997 the unemployment rates in the region had been varying both up and down. The boom in the East-Asian economies generated a lot of job opportunities and the unemployment numbers started to decrease in certain countries.

The countries that had seen an overall decrease in their unemployment prior to the crisis are Thailand, South Korea, Malaysia, and the Philippines. Whilst the unemployment seems to be increasing in Indonesia and Japan, the figures for Singapore and Hong Kong are fluctuating up and down.

After the crisis the numbers changed drastically for each country, with the change in 1997 to 1998 ranging from a rather small change percentage points in Singapore of 0.8 up to 4.2 percentage points change in South Korea. Observing Indonesia's unemployment we can

see that it has been drastically increasing after the crisis. Japan and Singapore were not drastically affected due to them not being directly hit by the crisis, but the contagion effect caused them to experience an increase in their numbers for 1997 to 1998. The plotted path for Japan is rather horizontal after 1998 indicating almost no change whilst Singapore's plotted line fluctuates up and down.

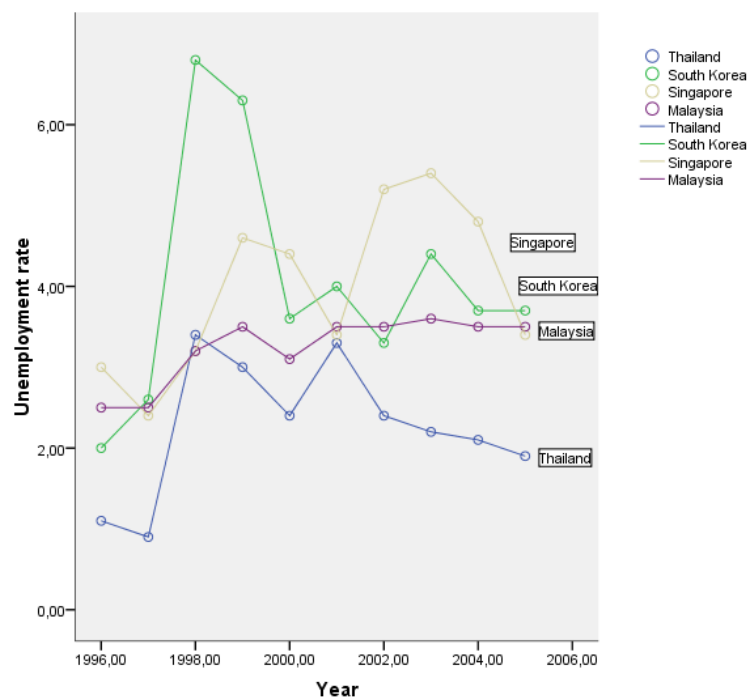


Figure 5.1.2 **Unemployment after 1995**

Source: IMF financial statistics yearbook

From observing the figures it is quite apparent that the financial crisis had an effect on the unemployment rates of each respective country. These countries were all affected in different magnitudes and the development of their figures has taken different paths. Thailand and South Korea have started decreasing their unemployment rates as is seen in the figures above, attempting to move back to the levels prior to the crisis. The unemployment rates of the other countries have either increased or stagnated around the level just after the crisis. But it is clear that none of the countries have come back to the level of unemployment prior to the crisis and therefore have not recovered in this aspect.

5.2 Gross Domestic Product

Japan, which is the most closed economy among those presented, was the first to recover to its initial Gross Domestic Product (GDP) level, already within the second year of the crisis (1999). The figures 5.2.1 and 5.2.2 below, illustrate the level of the log of GDP for each respective country in relation to time. From the figures one can also see the difference in the size of all these economies, and observing the non logged GDP levels in appendix 7, Japan is more than eight times as large as South Korea in terms of GDP in 1998, which is the second largest economy in the sample set. South Korea recovered in 2002 to the same GDP level as 1997 and they have continued to grow after this at a decreasing growth rate (see appendix 6). What is important to remember when observing the figures is that the axis of each respective figure is different.

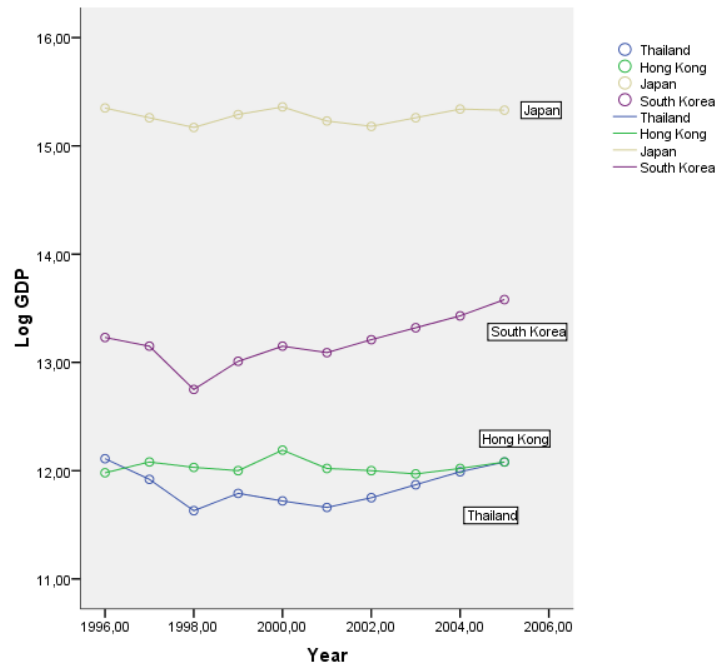


Figure 5.2.1

Log GDP after 1995

Source: IMF financial statistics yearbook

Hong Kong was another country that recovered fast; they were back to their initial GDP in the year 2000 which deviates from their other figures. After this their growth slowed down and had a decreasing trend with the GDP just below the 1997 level for the years 2001 to 2004. They were the only country that recovered only to fall back down below their 1997 level as illustrated by figure 5.2.1.

Thailand and Philippines were the countries that took the longest to recover; they returned to their 1997 level in 2004. The fact that Thailand was amongst those who took the longest to recover is quite understandable since this is where the Asian financial crisis broke out.

Singapore's GDP, as illustrated below in figure 5.2.2, also experienced a very low level of growth in GDP after the crisis, but it has been generally rising. Observing the GDP in relation to recovery in the figure, it shows that the GDP almost returned to the 1997 level much earlier than in 2004, but the numbers were just below this level. At the same time Singapore is the most open economy in the sample set and was among the three countries that took the longest to recover.

Both Indonesia and Malaysia recovered within six years (2003) and they have continued to grow after this. The figures in 5.2.2 illustrate a rather steep increase in the growth of the GDP for each of these respective countries.

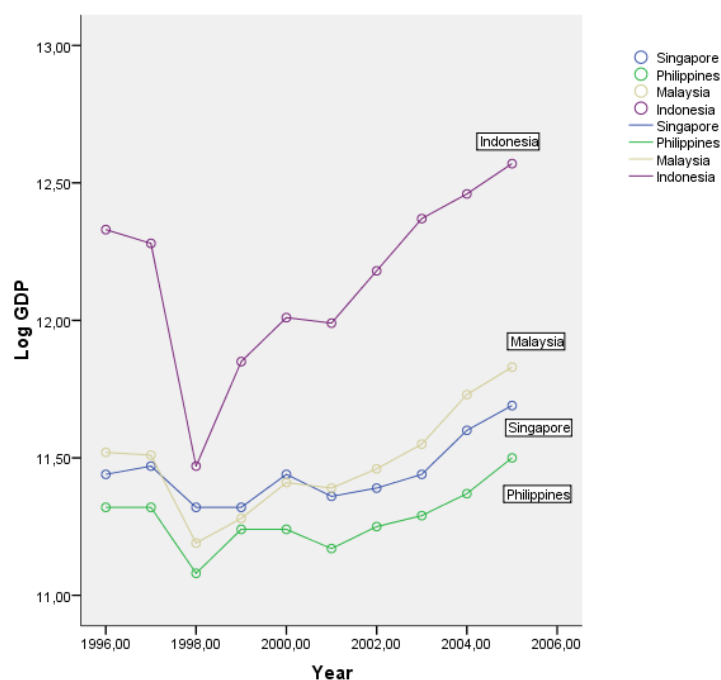


Figure 5.2.2

Log GDP after 1995

Source: IMF financial statistics yearbook

In terms of the GDP all the countries recovered by 2004. The different growth rates and the need to recover is dependant on how each country was affected after 1997, which is discussed in the next section.

5.3 Current Account

The current account balance, as mentioned earlier, is altered mainly by the exchange rate and the amount of disposable income there is within a country. To determine the effect that a change in relative prices of national outcome will have on the current account we need to consider the import and export sector of the country. If foreign products become more expensive than domestic products due to an increase in the real exchange rate, all else equal, a foreign output now buys more domestic outputs, the foreign consumption pattern will move in favour of domestic export. This change will improve the current account of the domestic country. As one considers the same real exchange rate increase effect on import one will see a more complicated situation. To respond to the price shift the domestic consumer will decrease their unit consumption of the more expensive foreign goods. Import is measured in terms of domestic outputs, so increases in real exchange rates does not imply that import have to fall. “Because a rise in the real exchange rates tends to raise the value of each units of imports in terms of domestic output units, imports measured in domestic output units may rise as a result of a rise in the real exchange rate even if imports decline when measured in foreign output units” (pg.410). Because of this import can rise or fall as a consequence of a real exchange rate increase, this creates an ambiguous effect of on the current account. The ‘*volume effect*’ is when consumer’s spending effects import and export quantities, whilst the “*value effect* changes the domestic output worth of a given volume of foreign imports” (pg. 410). Krugman & Obstfeld assume that the volume effect outweighs the value effect and thus a decrease in the exchange rate also decreases the current account. The effect of this at the same time also comes with a time lag; this is because

the import and export order of goods and services are usually planned a certain time ahead. Thus when a depreciation of the currency occurs, the previously ordered goods may reflect the consumption decisions made under the old exchange rate. It takes time for the new orders to adjust to the new price schemes and it takes time for the consumers to adjust. This time lag also has a certain effect on the pass-through of the exchange rate to the import prices, in turn affecting the trade volumes within a country. The time lag that this depreciation causes, and the theory behind, it is referred to as the J-curve (Krugman & Obstfeld, 2006).

The disposable income affects the current account a bit differently. An increase in the disposable income will cause the current account to decrease, because domestic consumption goes towards all goods including imports, whilst the opposite effect is apparent for a decrease in the disposable income (Krugman & Obstfeld, 2006).

Observing figures 5.3.1 and 5.3.2 for each of the country's current accounts one can see that all of the countries that were directly hit by the crisis experienced negative current accounts. With the outbreak of the crisis these countries current accounts went from negative to positive within a period of one year. The magnitude of the reversal varied in size from country to country and in turn affected each country's GDP. According to current account reversal theory put forward by Edwards (2004) the magnitude of the reversals effect on GDP is dependent on the degree of trade openness of each respective country.

The observations in these figures were calculated by the following formula:

$$\frac{CA_t}{\text{Avg GDP}}$$

Where CA_t is the current account of a country in year t and Avg GDP is the GDP average for that country for the years 1998 to 2005. The formula illustrates the form of the figures below, how each current account changed over a normalised GDP.

Observing the figures for the current accounts of each respective country all the countries that were directly hit by the crisis experienced a current account reversal, with the exception of Hong Kong. The figures for Hong Kong prior to 1998 are missing and a possible explanation to this is the change of government in 1997.

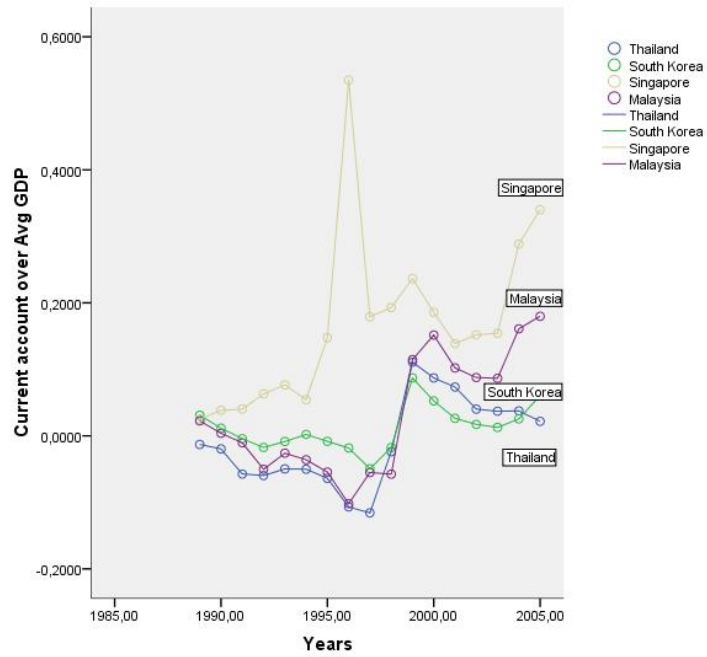


Figure 5.3.1 **Current account over average GDP**

Source: IMF financial statistics yearbook

The most closed economy, Japan, along with the most open economy, Singapore, both have positive figures from 1989 to 2005 in terms of their current account. Comparing these to the other countries all of them have negative current account figures prior to 1998 with the exception of South Korea who had positive figure in 1989 and 1990.

After 1997 the majority of the countries current account figures are positive and show generally higher values than those before 1998. The Philippines experienced negative current account figures between 1999 to 2002.

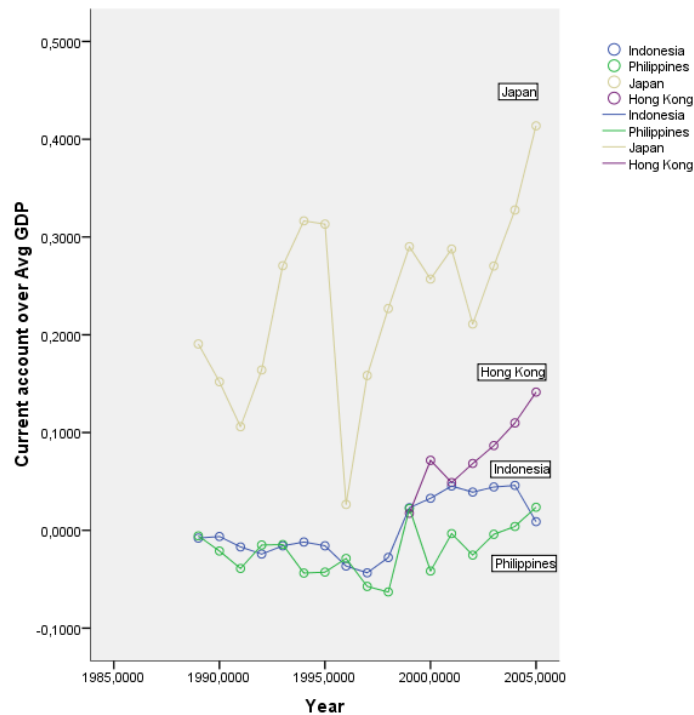


Figure 5.3.2 **Current account over average GDP**

Source: IMF financial statistics yearbook

The magnitude of the reversal of all these country's is shown in the table 5.3.1 below:

Table. 5.3.1 **Current Account Reversal**

Country	Reversal 1997 %
Japan	No reversal
Indonesia	4.29
Korea	11.7
Philippines	No reversal 2.37
Thailand	12.6
Malaysia	13.2
Hong Kong	Data not available
Singapore	No reversal

As mentioned above the data prior to 1997 was missing for Hong Kong and thus we could not calculate or conclude if there had been a reversal in Hong Kong's current account. The Philippines is another exception to the theory; they experience a change in their current account from negative to positive, but this change was only 2.37% of GDP, whilst a reversal is defined as at least a 4% of GDP.

Thus according to the theory of Edwards along with our hypothesis the results of countries that were affected by current account reversals and the effect on their GDP is correct with the acceptance of Malaysia.

5.4 The relation of the 1998 GDP drop to Openness

The theory of current account reversal says that the more closed an economy is the larger the negative effect of on GDP, whilst the more open the smaller is the effect. Figures 5.4.1 and 5.4.2 below illustrate this relationship. The countries that experienced a current account reversal were mentioned in the previous sector. The figures in this section show the relation and effect of a reversal on the GDP.

Edwards claimed that the effect of a current account reversal will always have a negative effect on the level of GDP in a country but the size of this is dependent on the trade openness. The more open a country is the smaller is the negative effect of the reversal on the GDP, whilst a relatively more closed economy GDP will suffer more.

Japan is one of the largest economies in the world and the difference in the level of their GDP in relation to the other countries in this sample is very substantial. In order to give a more true representation they are removed from the figure below 5.4.2.

The figures below, 5.4.1 and 5.4.2, illustrate the theory put forward by Edwards (2004), that the more closed an economy is the more affected it is by a current account reversal. The figures show that on average as the countries are increasing in openness the less they are affected by the crisis in terms of the magnitude of the drop of their GDP from the crisis. The trend line illustrates that increasing openness decreases the magnitude of the drop in GDP.

Among the countries presented in figure 5.4.1 Indonesia is the most closed economy at the time of the crisis with 0.44 degrees of openness, thus in accordance with the reasoning they should also be the most affected after the crisis. Analysing the change in GDP from 1997 to 1998 there is a drop calculated to be 55.76%; the level of GDP more than halved in one year. The drop is quite substantial and a drop of this magnitude causes major shocks in the economy and the establishment and thus in there is great potential for growth in the short run in order to return to the same level of GDP as before.

South Korea is in turn the second most closed economy amongst the affected countries. They show a drop of 33.09% in their GDP from 1997 to 1998, their GDP almost halved in the year of the crisis making them the second most affected by the crisis. Like all other countries they have the potential to recover fast and it is the third fastest growing country after the crisis. Thus both Indonesia and South Korea are in line with the theory that the more closed the economy is the more affected, the exception to this is Malaysia. They are the third most affected country but at the same time the third most open after Singapore, who was not affected in the same magnitude as Hong Kong. The drop in GDP for Malaysia from 1997's level to 1998 was 27.95% of GDP.

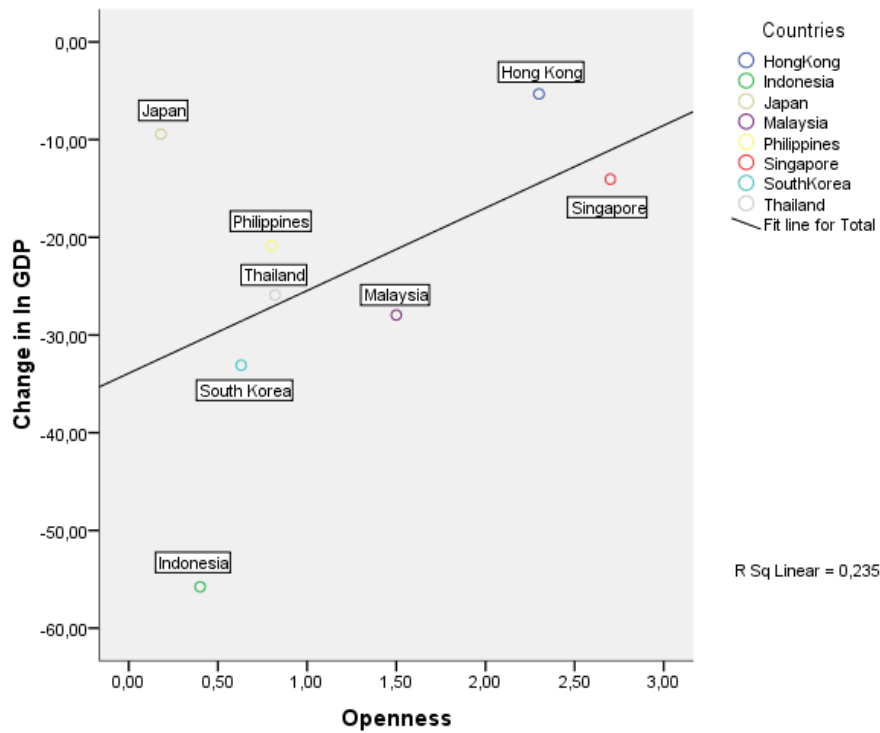


Figure 5.4.1 **The change in log GDP in 1998 in relation to Openness**

Source: IMF financial statistics yearbook

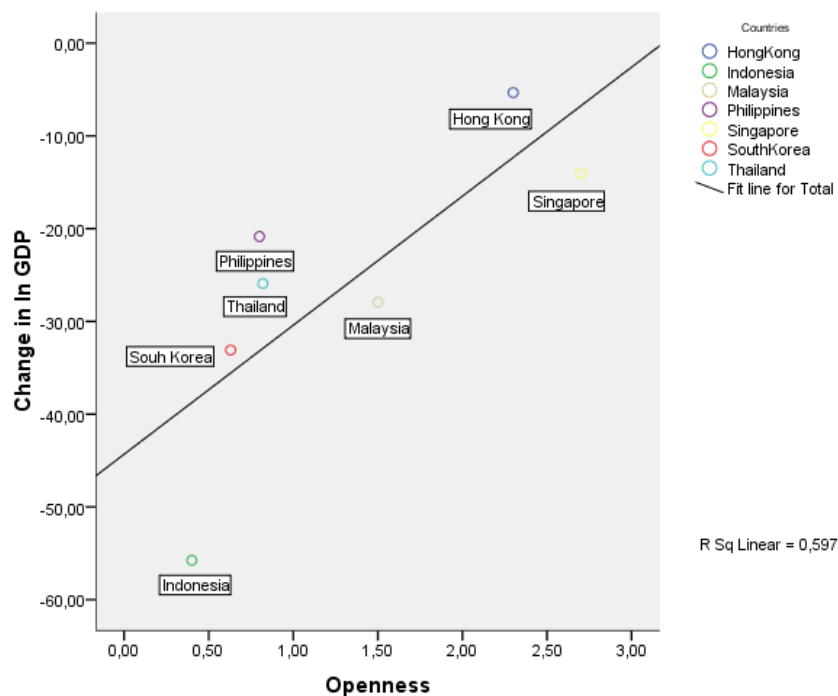


Figure 5.4.2 **The change in log GDP in 1998 in relation to Openness without Japan**

Source: IMF financial statistics yearbook

Hong Kong is the second most open economy in the analysis and as according to the theory of openness they are the least affected country in terms of GDP. The difference from 1997 to 1998 is only a slight drop of 5.33%. Hong Kong was not deeply affected in a large drop in their GDP but on the other hand their growth took a substantial hit.

Thailand is either the fourth most open country or the fifth most closed country depending on how you see it. They are on the other hand the fourth most affected, switching places with the Philippines who are fifth, but should be fourth according to the theory. This can though be explained by the fact that the degree of openness between these countries is very similar, Thailand with 0.8 degrees of openness and the Philippines with 0.77. Comparing the drops from 1997 to 1998 in GDP for each respective country Thailand was more affected with a drop of 25.91% whilst the Philippines had 20.85%. One logical explanation apart from the openness not being very different is that Thailand was the actual origin of the crisis and thus they should be and were more hit by speculative attacks as other countries were affected, in comparison to the Philippines. (See appendix 8)

Japan and Singapore are special cases since they did not experience a reversal and were not directly hit by the crisis. Even though these countries were not affected in terms of a reversal they were both negatively affected by the contagion effect causing a negative climate in the Asian economic area. Contagion as discussed in the previous research sector explains the spreading of the crisis to so many countries and also why it occurred so fast. The main reasons for the contagion effect is based on that the affected countries are all based on similar macroeconomic policies and at the same time are very well integrated through trade. Thus in accordance with this, when an external shock causes problems in one economy it will pass through very easily to the others.

In this case Singapore experienced the largest fall of the two with a decrease of 14.05% in their GDP whilst Japan only had a decrease of 9.44%. The drop in these countries' GDP plays a certain role but for Japan the need to recover to their initial growth rate is not as large as Singapore's. This is because Japan is one of the largest economies in the world and can handle this sort of debt and recover in due time, whilst Singapore is a very small economy which relies highly on their imports and exports as a contribution to GDP.

To test the validity of these results, the estimation results for the trend lines in Figure 5.4.1 and 5.4.2 (regression (1)) are presented in Table 5.4.1 below.

Table 5.4.1

Regression of change in log GDP on openness

	All countries	All countries except Japan
Slope coefficient	8.455	13.013
t-statistic	1.358	2.722
p-value	0.223	0.042
R^2	0.225	0.597

Looking at the p-value when all countries are included, we would not reject the null hypothesis that openness has no linear effect on the change in log GDP at a significance level

of 1 %. As we can see from figure 5.4.1, and as confirmed by the sign of the estimated slope coefficient in table 5.4.1 when all countries are used, there is an increase in log of GDP a decreasing negativness in that change as the openness of a countries is increasing. This is not in line with the stated hypothesis that the more open an economy is the more vulnerable they are to an external shock. As Japan is removed from the regression the same conclusion is reached. In figure 5.4.2 one can see a steeper trend line than in figure 5.4.1, which is also reflected in the regression results, strengthening the conclusion that, in other words, the more closed an economy is the more affected it would be.

5.5 Openness of countries and growth

This section analyses what relation the openness of a country has on its average growth level after the crisis.

The figure 5.5.1. below shows a decreasing trend between GDP growth and increasing openness. The most closed economy in the sample, Japan, was the third largest economy in the world in 2005 (CIA World factbook, 2005) measured in purchasing power parity of GDP and therefore it is not surprising that they are more closed than the other countries. The growth level is very low but they are not in the same need to grow as other countries as explained by the theory of openness, that a large economy can afford to be more closed. At the same time the growth rate has not changed much from the years prior to the crisis; it has been rather maintained. Furthermore the case of Hong Kong is also very special since it has been experiencing an average decrease in its growth rate level after the crisis.

In order to give a more true representation of how the countries growth rates were affected after the crisis, another figure was provided excluding Japan and Hong Kong.

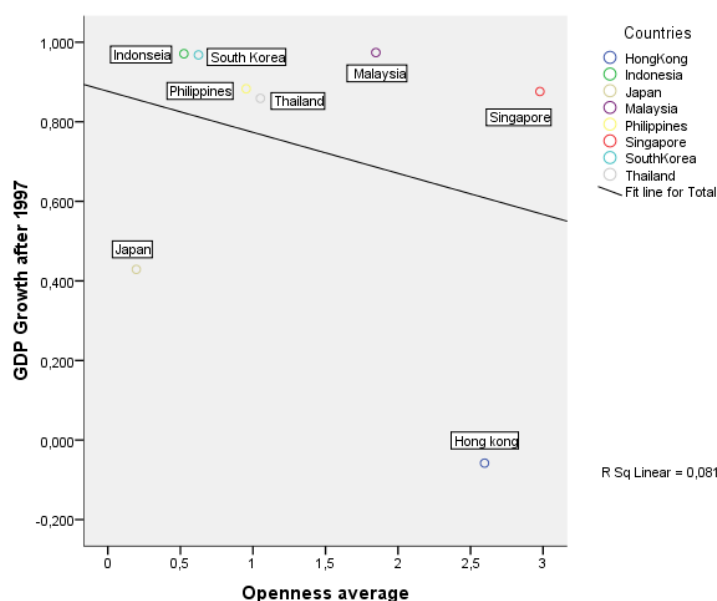


Figure 5.5.1 **The effect of openness on average growth after 1997**

Source: IMF financial statistics yearbook

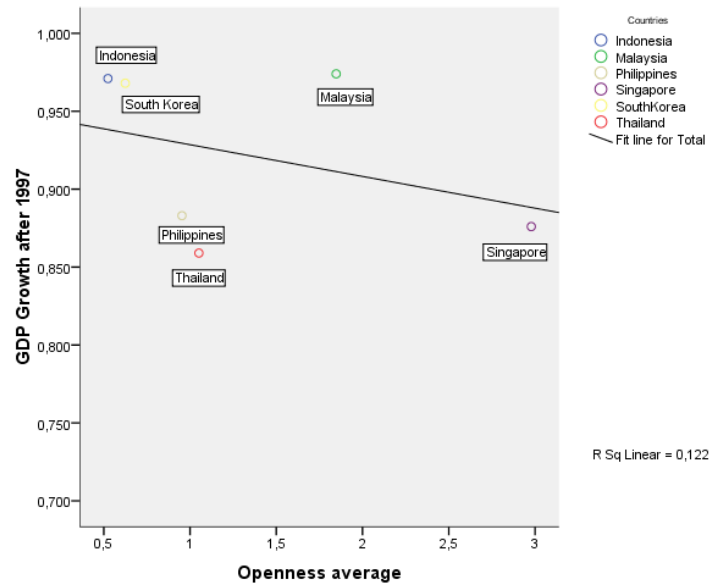


Figure 5.5.2 **The effect of openness on average growth after 1997 - Without Hong Kong and Japan**

Source: IMF financial statistics yearbook

Figure 5.5.2 illustrates how the openness of each country is related to the rate of growth after 1997, measured by the gradient of the growth trend line (see appendix 9). The figures for openness are taken from appendix 5. Observing the figure we can see that all countries are following the same pattern, that the more open an economy is the smaller the growth is after the crisis.

The countries that are most affected when a crisis occurs are usually the most eager and in need to recover faster than the less affected naturally. Since they were hit in a larger magnitude they have a larger amount to recover until they return to the level before the crisis. The theory says that the more open a country is the more vulnerable they are to an external shock, at the same time they are more able to handle a shock with the help of their trade balance. Thus if a more closed economy is hit they do not have the same abilities to deal with the crisis and should thus be more affected by a crisis.

As Thailand was the origin of the crisis and Indonesia, Malaysia and South Korea were the most affected and were considered in trouble, the International Monetary Fund offered to help all of these countries in their financial situation along with other organisations such as the World Bank. All these except Malaysia accepted to be helped both financially and with policies. South Korea, the largest of the economies, received the most funding - a total of 58.4 billion dollars US, with 21.1 billion dollars US coming from the IMF. Indonesia which is second largest in terms of GDP received 49.7 billion dollars US whilst Thailand received 17.2 billion dollars US (IMF, 2005).

With funding from the IMF and the World Bank these countries have had a helping hand in their struggle to recover from the crisis. Indonesia, which was the most affected country, was also in need to recover the fastest. Looking at their growth rate after the crisis they are the second fastest growing after the crisis. Figure 5.5.1 shows that Malaysia has the highest growth rate out of the countries in the sample and it is tightly followed by Indonesia and South Korea. According to the logic, the most affected countries should be those who

should have the fastest growth rate to recover faster. Thus Indonesia and South Korea are in line with the logic but Malaysia is going against the logic slightly.

Both the Philippines and Thailand have very similar levels of growth after the crisis, similar to how they were affected by the crisis. In this case the Philippines has been growing slightly faster than Thailand, even though Thailand was in larger need to grow faster in accordance to what magnitude they were affected in. The reason again for Thailand not being able to maintain a higher growth is due to it being the origin of the crisis and a lot of structural reforms taking place in the country.

The observation for Hong Kong which was excluded in figure 5.5.1 since it is the only country with a negative average growth from 1997 to 2005. In other words the crisis has affected Hong Kong very negatively but in a different sense in comparison to the other countries. (See appendix 7)

Statistics for the trend lines are presented in Figures 5.5.1 and 5.5.2 (regression (2)) above are presented in table 5.5.1 below.

Table 5.5.1

Regression of average Growth after 1997 on Openness

	All countries after 1997	All countries after 1997 except Japan and Hong Kong
Slope Coefficient	-0.103	-0.020
t-statistic	-0.729	-0.745
p-value	0.494	0.498
R^2	0.081	0.122

Whether one decides to have all the countries in the regression or exclude Japan and Hong Kong, the outcome is similar. As is seen from figure 5.5.1 and 5.5.2 and as confirmed by the sign of the estimated slope coefficients in table 5.5.1 there is a negative relation, showing that the GDP growth will decrease as average openness is increasing. However for both of the regressions one can not reject the null hypothesis that there is no linear effect of openness on average growth. At the same time the R-squared values for the regressions in table 5.5.1 are both very low, meaning that the goodness of fit of the regressions is not so strong. In other words both the figures and regressions show that the relation between openness and growth is not so strong.

As mentioned earlier the IMF along with the World Bank provided a lot of funding towards South Korea and Indonesia who were the second and third most growing economies after the crisis. At the same time they are the two most closed countries that were affected, and the two most affected in terms of the magnitude of the drop in GDP. The countries that were most affected are in greater need to recover fast than those less affected. This could have certain implications for testing the theory put forward.

An interesting observation is that for all the countries the average openness increases in the period 1998 to 2005 in comparison to the period before the crisis 1989 to 1996 even though these countries were experiencing a very large growth period at that time (see ap-

pendix 5). An explanation for this is that the countries had to open their trade sector in order to recover from the drop that they experienced after the crisis. If a country trades more this takes a larger percent of their total GDP, thus they become more open.

6 Conclusion

The Asian financial crisis effectively put an end to what was known as the 'Asian miracle'. As the thesis shows, many countries in Asia were affected, all of them in different magnitudes. The thesis shows what a financial crisis can do to a region and the economic climate. What is important to remember is that there are many implications on the rest of the world when a crisis of this magnitude hits a large economic region as Asia. This is something that has not been covered within the thesis due to the magnitude of information and knowledge one would have to have in order to draw any relevant conclusion.

This thesis shows that the degree of openness has an effect on how a country is affected during a financial crisis in terms of its current account, which in turn affects the growth of its GDP. The first regression results show that the effect of openness on the drop in GDP after the Asian financial crises, that the more closed an economy is the larger the drop in GDP after a crisis. Looking further at how openness affects growth in the years after the crisis there is no direct indication of a linkage of that the more open the higher the growth rate will be. The descriptive statistics and the regression show that the more closed a country is the more they will grow (although this is not statistically significant) which was not in accordance to the hypothesis.

One conclusion that can be drawn from the analysis is that all the countries have recovered in terms of their level of GDP. But a total recovery has not been achieved since the unemployment rate prior to the crisis is lower in all countries than what it is for all the years after. It is important though to remember that the growth levels for the majority of the countries was very high prior to the crisis, something which they all had not experience before and thus it is hard to expect for these countries to return to the same level under eight years.

Suggestions for further research that could be of use and give a more concentrated direct answer is to analyse more deeply a very specific area such as only looking at the current account effect. Since there is a problem to explain a valid result when one takes into many aspects into their analysis.

Furthermore a suggestion is to analyse the affected trading partners who are located in another region to see if they were affected in the same way as the countries in the Asian region.

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Appendix 1

Unemployment rates (%) Period Average

Years	Thailand	South Korea	Singapore	Malaysia	Indonesia	Philippines	Japan	Hong Kong
1989	1.4	2.6	2.2	6.3	2.8	8.4	2.3	1.1
1990	2.2	2.4	1.7	5.1	2.5	8.11	2.1	1.3
1991	2.7	2.3	1.9	4.3	2.6	9	2.1	1.8
1992	1.4	2.4	2.7	3.7	2.7	9.8	2.2	2
1993	1.5	2.8	2.7	3	2.8	9.3	2.5	2
1994	1.3	2.4	2.6	2.9	4.4	9.5	2.9	1.9
1995	1.1	2	2.7	2.8		9.5	3.2	3.2
1996	1.1	2	3	2.5	4	8.6	3.4	2.8
1997	0.9	2.6	2.4	2.5	4.7	8.7	3.4	2.2
1998	3.4	6.8	3.2	3.2	5.5	10.1	4.1	4.7
1999	3	6.3	4.6	3.5	6.4	9.8	4.7	6.3
2000	2.4	4.4	4.4	3.1	6.1	11.2	4.7	5
2001	3.3	4	3.4	3.5	8.1	11.1	5	5.1
2002	2.4	3.3	5.2	3.5	9.1	11.4	5.4	7.3
2003	2.2	3.6	5.4	3.6	10.6	11.4	5.3	7.9
2004	2.1	3.7	4.8	3.5	8.7	11.8	4.7	6.8
2005	1.9	3.7	3.4	3.5	9.2	11.4	4.4	5.6

Source: International Monetary Fund financial statistics yearbook

Appendix 2

Unemployment

Years	Thailand	South Korea	Singapore	Malaysia	Indonesia	Philippines	Japan	Hong Kong
1988	929000	435000	46000	482000	2106000	1954000	1550000	38000
1989	433000	463000	31000	389000	2083000	2009000	1420000	30000
1990	710000	454000	26000	315000	1952000	1993000	1340000	37000
1991	869000	436000	30000	314000	2032000	2267000	1360000	50000
1992	456000	465000	43000	271000	2199000	2263000	1420000	55000
1993	646000	550000	44000	317000	2246000	2379000	1656000	57000
1994	423000	489000	44000	228000	3738000	2622000	1920000	56000
1995	375000	419000	47000	248000		2704000	2098000	96000
1996	354000	425000	54000	217000	4287000	2546000	2250000	87000
1997	293000	557000	46000	215000	4197000	2640000	2303000	71000
1998	1138000	1463000	62000	287000	5062000	3043000	2787000	154000
1999	986000	1353000	90000	314000	6030000	3017000	3171000	208000
2000	813000	974000	96000	299000	5813000	3459000	3198000	167000
2001	119000	899000	72000	342000	8005000	3653000	3395000	175000
2002	826000	752000	110000	344000	9132000	3874000	3588000	256000
2003	761000	818000	111000	370000		3936000	3504000	277000
2004	741000	868000		367000		4249000	3134000	241000
2005	666000	887000		372000		4145000	2940000	201000

Source: International Monetary Fund financial statistics yearbook

Appendix 3

Series Key:

PA = Population growth (annual %)

PT = Population Total

Country Name	Series	YR1989	YR1990	YR1991	YR1992	YR1993	YR1994
Hong Kong	PA	1,0359	0,3213	0,8292	0,8397	1,7178	2,2520
Hong Kong	PT	5686200	5704500	5752000	5800500	5901000	6035400
Indonesia	PA	1,7688	1,7938	1,7179	1,6420	1,5662	1,4903
Indonesia	PT	175063344,00	178232000,00	181320358,03	184322300,55	187231804,74	190042962,43
Korea, Rep.	PA	0,9602	1,1472	0,9264	0,9088	0,8960	0,8971
Korea, Rep.	PT	42380000	42869000	43268000	43663000	44056000	44453000
Malaysia	PA	2,8857	2,7980	2,6923	2,6007	2,5408	2,5242
Malaysia	PT	17603827	18103341	18597361	19087376	19578569	20079056
Japan	PA	0,4094	0,3414	0,3104	0,2482	0,2468	0,3407
Japan	PT	123116000	123537000	123921000	124229000	124536000	124961000
Philippines	PA	2,3839	2,3567	2,3309	2,3069	2,2767	2,2396
Philippines	PT	59799928	61225972	62669859	64132377	65609257	67095197
Singapore	PA	2,9429	3,8814	2,8504	3,0038	2,5306	3,1343
Singapore	PT	2931000	3047000	3135100	3230700	3313500	3419000
Thailand	PA	1,2696	1,2355	1,2021	1,1701	1,1472	1,1347
Thailand	PT	53624669	54291323	54947895	55594639	56236105	56877831

Country Name	Series	YR1995	YR1996	YR1997	YR1998	YR1999	YR2000
Hong Kong	PA	1,9801	4,4386	0,8325	0,8348	0,9551	0,8816
Hong Kong	PT	6156100	6435500	6489300	6543700	6606500	6665000
Indonesia	PA	1,4144	1,3947	1,3750	1,3554	1,3357	1,3160
Indonesia	PT	192750000,00	195457134,30	198163293,95	200867393,24	203568332,74	206265000,00
Korea, Rep.	PA	1,4295	0,9535	0,9379	0,7220	0,7104	0,8355
Korea, Rep.	PT	45093000	45525000	45954000	46287000	46617000	47008111
Malaysia	PA	2,5320	2,5463	2,5377	2,4900	2,3930	2,2654
Malaysia	PT	20593952	21125065	21668014	22214316	22752310	23273615
Japan	PA	0,3818	0,2564	0,2621	0,2527	0,1897	0,1736
Japan	PT	125439000	125761000	126091000	126410000	126650000	126870000
Philippines	PA	2,1991	2,1547	2,1153	2,0913	2,0871	2,0946
Philippines	PT	68587012	70080887	71579068	73091778	74633277	76213060
Singapore	PA	3,0390	4,0644	3,3566	3,3979	0,7989	1,7329
Singapore	PT	3524500	3670700	3796000	3927200	3958700	4027900
Thailand	PA	1,1275	1,1270	1,1203	1,0907	1,0307	0,9509
Thailand	PT	57522738	58174703	58830127	59475310	60091464	60665589

Country Name	Series	YR2001	YR2002	YR2003	YR2004	YR2005
Hong Kong	PA	0,7325	0,3667	0,3667	0,3667	0,3667
Hong Kong	PT	6714000	6738663.76	6763418.13	6788263.43	6813200
Indonesia	PA	1,3240	1,3320	1,3400	1,3480	1,3560
Indonesia	PT	209014094,83	211816758,36	214674159,94	217587497,82	220558000,00
Korea, Rep.	PA	0,7321	0,5509	0,4904	0,4856	0,4399
Korea, Rep.	PT	47353519	47615132	47849227	48082163	48294143
Malaysia	PA	2,1308	2,0130	1,9186	1,8560	1,8156
Malaysia	PT	23774848	24258296	24728210	25191441	25652985
Japan	PA	0,2197	0,2325	0,2140	0,0337	0,0094
Japan	PT	127149000	127445000	127718000	127761000	127773000
Philippines	PA	2,1043	2,1055	2,0944	2,0674	2,0286
Philippines	PT	77833803	79489929	81172343	82867926	84566163
Singapore	PA	2,6967	0,9141	-1,4764	1,2534	2,3505
Singapore	PT	4138000	4176000	4114800	4166700	4265800
Thailand	PA	0,8633	0,7862	0.730080774166714	0,7034	0,6974
Thailand	PT	61191592	61674588	62126510	62565066	63002911

<http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showRepo>

Appendix 4

Current account in millions of US\$

Years	Thailand	South Korea	Singapore	Malaysia	Indonesia	Philippines	Japan	Hong Kong
1988	-1654	14505	1937	1867	-1397	-390	79250	
1989	-2498	5361	2964	315	-1108	-1456	63210	
1990	-7281	-2003	3122	-870	-2988	-2695	44080	
1991	-7571	-8137	4880	-4183	-4260	-1034	68200	
1992	-6303	-3944	5915	-2167	-2780	-1000	112570	
1993	-6364	990	4211	-2991	-2106	-3016	131640	
1994	-8085	-3867	11400	-4520	-2792	-2950	130260	
1995	-13554	-8507	41373	-8469	-6431	-1980	11040	
1996	-14691	-23006	13854	-4596	-7663	-3953	65880	
1997	-3024	-8167	14919	-4792	-4889	-4351	94350	
1998	14048	40558	18286	9529	4096	1546	120700	2507
1999	11050	24522	14361	12604	5783	-2874	106870	10248
2000	9313	12251	10728	8488	7992	-225	119660	6993
2001	5101	8033	11760	7287	6901	-1744	87800	9786
2002	4691	5934	11918	7190	7824	-279	112450	12412
2003	4772	11950	22317	13381	8107	288	136220	16470
2004	2759	28174	26318	14871	1563	1633	172060	15728
2005	-7857	14981	33212	19980		2338	165780	20233

Source: International Monetary Fund financial statistics yearbooks

Appendix 5

Openness to Trade

Year	Thailand	South Korea	Singapore	Malaysia	Indonesia	Philippines	Japan	Hong Kong
1989	0.6322	0.5363	3.1280	1.2005	0.3758	0.4460	0.1641	2.1133
1990	0.6585	0.5096	3.0742	1.3012	0.4142	0.4790	0.1716	2.1415
1991	0.6701	0.4962	2.8922	1.4155	0.4281	0.4774	0.1589	2.2383
1992	0.9011	0.4783	2.7243	1.3498	0.4392	0.4767	0.1514	2.3359
1993	0.6648	0.4566	2.7320	1.3681	0.4112	0.5515	0.1386	2.2834
1994	0.9566	0.4654	2.8163	1.5627	0.4064	0.5619	0.1402	2.3108
1995	0.7545	0.4931	2.8738	1.6762	0.4254	0.6171	0.1478	2.5411
1996	0.7016	0.4826	2.7616	1.5304	0.4075	0.6638	0.1635	2.3859
1997	0.7942	0.5193	2.6712	1.5524	0.4399	0.7715	0.1780	2.2550
1998	0.8513	0.6192	2.5475	1.8077	0.7932	0.9328	0.1730	2.1478
1999	0.8161	0.5773	2.7228	1.8757	0.5165	0.8851	0.1662	2.2745
2000	1.0601	0.6429	2.9290	1.9765	0.5772	0.9865	0.1837	2.1140
2001	1.0907	0.5994	2.7649	1.8194	0.5413	0.9407	0.1835	2.3469
2002	1.0382	0.5702	2.7266	1.8062	0.4505	0.9912	0.1921	2.4892
2003	1.0867	0.6047	3.1649	1.7904	0.3975	0.9868	0.2018	2.8731
2004	1.1735	0.6933	3.3966	1.8473	0.4173	0.9848	0.2212	3.1961
2005	1.2939	0.6895	3.5729	1.8547	0.4996	0.9176	0.2436	3.3317
AVG 89-96	0.7424	0.4898	2.8753	1.4255	0.4135	0.5342	0.1545	2.2938
AVG98-05	1.0513	0.6245	2.9782	1.8472	0.5242	0.9532	0.1956	2.5967
Avg 89-05	0.8908	0.5549	2.9117	1.6315	0.4671	0.7453	0.1753	2.4340

Source: Import & Export figures from Comtrade Database and GDP from DDP World Bank Quick Query Database

Appendix 6

GDP Growth rate (%)

Years	Thailand	South Korea	Singapore	Malaysia	Indonesia	Philippines	Japan	Hong Kong
1988	13	11	11	10	6	7	7	8
1989	12	7	10	9	9	6	5	8
1990	11	9	9	9	9	3	5	4
1991	9	9	7	10	9	-1	3	6
1992	8	6	6	9	7	0	1	6
1993	8	6	12	10	7	2	0	6
1994	9	9	12	9	8	4	1	6
1995	9	9	8	10	8	5	2	2
1996	6	7	8	10	8	6	3	4
1997	-1	5	8	7	5	5	2	5
1998	-11	-7	-1	-7	-13	-1	-2	-6
1999	4	9	7	6	1	3	0	3
2000	5	8	9	9	5	6	3	8
2001	2	4	-2	0	4	2	0	0
2002	5	7	4	4	4	4	0	2
2003	7	3	3	6	5	5	1	3
2004	6	5	9	7	5	6	3	8
2005	5	4	7	5	6	5	2	7

Source: IMF International Financial Statistics yearbook

Appendix 7

Gross Domestic Product in USD Millions

Years	Thailand	South Korea	Singapore	Malaysia	Indonesia	Philippines	Japan	Hong Kong
1989	72 251	230 473	30 117	38 849	101 455	42 575	2 940 288	68 752
1990	85 345	263 777	36 842	44 024	114 426	44 312	3 018 271	76 887
1991	98 234	308 185	43 165	49 134	128 168	45 418	3 451 454	88 833
1992	80 929	329 886	49 716	59 151	139 116	52 976	3 767 083	104 002
1993	125 009	362 136	58 158	66 894	158 007	54 368	4 324 015	119 958
1994	103 754	423 434	70 679	74 481	176 892	64 085	4 760 420	135 542
1995	167 896	517 118	84 291	88 832	202 132	74 120	5 247 609	144 230
1996	181 689	557 644	92 552	100 852	227 370	82 848	4 635 652	158 966
1997	150 891	516 282	95 867	100 169	215 749	82 344	4 258 576	176 312
1998	111 860	345 432	82 399	72 175	95 446	65 172	3 856 551	166 909
1999	132 562	445 399	82 611	79 148	140 001	76 157	4 368 738	163 283
2000	122 725	511 658	92 717	90 320	165 021	75 913	4 667 449	196 121
2001	115 536	481 899	85 615	88 001	160 447	71 216	4 095 487	166 593
2002	126 877	546 934	88 266	95 164	195 661	76 814	3 918 333	163 781
2003	142 640	608 148	93 152	103 992	234 772	79 633	4 229 097	158 572
2004	161 340	680 492	109 157	124 749	256 837	86 930	4 605 934	165 886
2005	176 420	791 427	119 778	137 163	286 969	98 712	4 549 110	177 772

Source: DDP World Bank Quick Query Database

Appendix 8

	Openness	Fall in GDP Us\$ Millions	Fall in GDP 1997 to 1998	Slope before	Slope after	Difference in slope
Japan	0.17	402025	-9.44%	0.857	0.429	-0.428
Indonesia	0.44	120303	-55.76%	0.988	0.972	-0.016
South Korea	0.52	170850	-33.09%	0.979	0.968	-0.011
Philippines	0.77	17217	-20.85%	0.981	0.882	-0.099
Thailand	0.8	39031	-25.91%	0.892	0.86	-0.032
Malaysia	1.5	27994	-27.95%	0.993	0.974	-0.019
Hong Kong	2.3	9403	-5.33%	0.994	-0.058	-1.052
Singapore	2.7	13468	-14.05%	0.993	0.875	-0.118

Appendix 9

Before 1997

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,005	,000	,993	22,760	,000
(Constant)	-6,976	,412		-16,928	,000

The dependent variable is ln(HongKong).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,004	,000	,988	16,750	,000
(Constant)	-5,617	,480		-11,712	,000

The dependent variable is ln(Indonesia).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,005	,000	,992	21,422	,000
(Constant)	-7,884	,479		-16,453	,000

The dependent variable is ln(Malaysia).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,004	,000	,981	13,533	,000
(Constant)	-5,237	,563		-9,309	,000

The dependent variable is ln(Philippines).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,006	,000	,992	21,055	,000
(Constant)	-9,817	,579		-16,953	,000

The dependent variable is ln(Singapore).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,004	,000	,979	12,609	,000
(Constant)	-5,981	,669		-8,946	,000

The dependent variable is ln(South Korea).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,004	,001	,893	5,236	,001
(Constant)	-6,114	1,626		-3,759	,007

The dependent variable is ln(Thailand).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Year	,002	,001	,858	4,413	,003
(Constant)	-1,871	,998		-1,874	,103

The dependent variable is ln(Japan).

After 1997**Coefficients**

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	-6,141E-5	,000	-,058	-,142	,891
(Constant)	2,541	,863		2,943	,026

The dependent variable is ln(Hong Kong).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,006	,001	,971	9,875	,000
(Constant)	-8,623	1,118		-7,710	,000

The dependent variable is ln(Indonesia).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,003	,000	,974	10,582	,000
(Constant)	-4,446	,647		-6,876	,000

The dependent variable is ln(Malaysia).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,002	,000	,883	4,597	,004
(Constant)	-1,206	,782		-1,543	,174

The dependent variable is ln(Philippines).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,002	,000	,876	4,446	,004
(Constant)	-1,424	,859		-1,658	,148

The dependent variable is ln(Singapore).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,004	,000	,968	9,435	,000
(Constant)	-5,099	,801		-6,363	,001

The dependent variable is ln(South Korea).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,002	,001	,859	4,119	,006
(Constant)	-1,969	1,063		-1,852	,113

The dependent variable is ln(Thailand).

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Y	,000	,000	,429	1,164	,289
(Constant)	1,650	,761		2,169	,073

The dependent variable is ln(Japan).

Appendix 10

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	-33,908	9,007		-3,764	,009	-55,949	-11,868
	Openness	8,455	6,228	,485	1,358	,223	-6,785	23,696

a. Dependent Variable: Change in GDP

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	418,264	1	418,264	1,843	,223
Residual	1361,782	6	226,964		
Total	1780,046	7			

The independent variable is Openness.

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
,485	,235	,107	15,065

The independent variable is Openness.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	-44,321	7,894		-5,615	,002	-64,612	-24,030
	Openness	13,913	5,111	,773	2,722	,042	,776	27,050

a. Dependent Variable: Change in GDP without Japan

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	917,322	1	917,322	7,411	,042
Residual	618,862	5	123,772		
Total	1536,184	6			

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
,773	,597	,517	11,125

The independent variable is Openness.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	,877	,233		3,758	,009	,306	1,447
	Openness average	-,103	,141	-,285	-,729	,494	-,449	,243

a. Dependent Variable: GDP Growth after 1997

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	,077	1	,077	,531	,494
Residual	,870	6	,145		
Total	,947	7			

The independent variable is Openness average.

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
,285	,081	-,072	,381

The independent variable is Openness average.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	,949	,043		21,968	,000	,829	1,069
	Openness average	-,020	,027	-,349	-,745	,498	-,096	,056

a. Dependent Variable: GDP Growth after
1997 without Japan and Hongkong

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	,002	1	,002	,554	,498
Residual	,013	4	,003		
Total	,015	5			

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
,349	,122	-,098	,057

The independent variable is Openness average.