# An Econometric Analysis of Selected Determinants of Foreign Direct Investment

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We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Master of Business Administration.

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# ABSTRACT

The main focus of this thesis is to analyze the impact of some variable such as Inflation rate, GDP Growth, Financial Development and openness on Foreign Direct Investment (FDI), in selected emerging economics. The sample of countries includes Turkey, Argentina, India, Poland and Hungary. In this study Pooled Regression Analysis will be used to estimate the general effect of some economic variables such as Financial Development, Inflation Rate, Growth Rate of GDP and Openness on FDI based on the data of all countries in our sample.

In addition, we will add several control variables as variables to the right side of our Foreign Direct Investment equation such as last year's FDI or last year Financial Development. At last, this study will present that how each economic variable will effect on Foreign Direct Investment; on the other hand this thesis will present the amount of effect of each economic variable on Foreign Direct Investment.

**Keywords:** Foreign Direct Investment, Financial Development, Inflation Rate, GDP, Openness.

# ÖZ

Bu tezin ana hedefi, gelişmekte olan ekonomilerde Doğrudan Yabancı Yatırım (DYY) Enflasyon oranı, GSYİH Büyüme, Finansal Gelişme ve açıklık gibi bazı değişken etkisini analiz etmektir. Ülkelere örnek olarak Türkiye, Arjantin, Hindistan, Polonya ve Macaristan göstere biliriz. Bu çalışmada Toplanmış Regresyon Analizi Finansal Gelişme, Enflasyon Oranı, GSYİH Büyüme Hızı ve bizim örnek tüm ülkelerin verilerine dayanarak DYY üzerindeki açıklık gibi bazı ekonomik değişkenlerin genel etkisini tahmin etmek için kullanılır.

Ayrıca, değişken olarak bizim Doğrudan Yabancı Yatırım denklemin sağ tarafında geçen yılki DYY veya geçen yıl Finansal Gelişme gibi birkaç kontrol değişkenleri katacağız. Son olarak, bu çalışma nasıl her ekonomik değişkenin Doğrudan Yabancı Yatırımı etkilediğini sunacak; diğer taraftan bu tez, her ekonomik değişkenin Doğrudan Yabancı Yatırım üzerindeki etkisi miktarını sunacak.

**Anahtar Kelimeler**: Doğrudan Yabancı Yatırım, Finansal Gelişme, Enflasyon Oranı, GSYİH, Açıklık.

This thesis is lovingly dedicated to my parents who have been my constant source of inspiration. Without their love and support this thesis would not have been made possible.

# ACKNOWLEDGMENT

I want to thank my kind supervisor Prof. Dr. Serhan Cifticioglu not only for his supervisory, supporting and guiding for this thesis also for providing me the opportunity for researching, reading and writing. In continuing my great thank for Dr. Hesam Shahrivar who helped me patiently to achieve my aims in this study with his helps and guidance. Besides I want to thank my father (Mohammad Reza Rahimov), my mother (Seddigheh Eshghdoust) and my brother (Dr. Mostafa Rahimov) who supported and prayed amorously for my success.

# TABLE OF CONTENT

# LIST OF FIGURES

# Chapter 1

# INTRODUCTION

## 1.1 The Aim of Study

Foreign direct investment is one of the most effective parameters in economic. Many countries changed their economic pattern to improve their foreign direct investment. Now day multinational firms apply foreign direct investment to use the advantage of it and win in economic competition.

The goal of this study is finding the parameters which effect on the foreign direct investment in emerging countries and find how each parameter effect on foreign direct investment. At first we collect data about our samples. Our sample includes Argentina, Hungary, Turkey, India and Poland. On the other hand our variables are growth rate of GDP, inflation rate, financial development and openness. After that we will present a pattern about effect of each parameter in whole emerging country.

## 1.2 Background of Study

When emerging countries today read the business section of the paper, or obtain quotations of their favorite investment, one of the statistics which usually should be noticed is the prediction of FDI. After seeing the GDP of each country, which is usually the most interesting factor, an investor may look some economic variables such as Financial Development and Openness on FDI, price-to-earnings ratio, market capitalization. Despite these variables are ignored by emerging and developed countries, trade volume has relation to these variables.

## 1.3 Significance of Study

The goal of this study is finding the parameters which effect on the foreign direct investment in emerging countries and find how each parameter effect on foreign direct investment. At first we collect data about our samples. Our sample includes Argentina, Hungary, Turkey, India and Poland. On the other hand our variables are growth rate of GDP, inflation rate, financial development and openness.

After that we will present a pattern about the effect of each parameter in the whole emerging country.

## 1.4 Problem Statement

Since FDI use as a one of the significant factors for computing GDP and investigating for annual FDI, I would like to consider FDI as a dependent variable for measuring of GDP. At the first stage of this research, we will find those economic variables which effect on FDI, and then we will suggest a specific formula for predicting and calculating FDI. The significance of this research is predicting of FDI which is quite effective on calculation of GDP. Those emerging countries which looking for investing from developed countries, should aware of these figures in order to optimize and cost reduction.

One of the important factors for FDI is that find those variables which will be effected on calculation of FDI. In chapter two, we will familiarize with the effect of each selected factors in FDI. On the other hand, those of factors which will precisely compute on each other in different years and each one of sample countries in order to formalize a final formula for calculating FDI. In the next stage, we close to our

independent variables with different shapes which will compute from e-views base on each variable.

Finally, we will get to the point that whether our prediction regarding FDI will be will correct or not. In the other words, based on these predictions regarding FDI those emerging countries would be able to make a precise plan in order to investment on those potential countries which will lead to cost reduction of their products.

In the chapter second, the advantage and disadvantage of FDI either emerging countries or developed countries will elaborately discuss with analyzing our variables.

## 1.5 Research Questions

The following questions provide an overview of research in the area of Foreign Direct Investment within the wider discipline of stochastic economics is as follows:

- What is the relationship between FDI and Financial Development?
- What is the relationship between FDI and Growth rate of GDP?
- What is the relationship between FDI and Inflation?
- What is the relationship between FDI and Openness

## 1.6 Summary of Each Chapter

Chapter 2:

In chapter 2, this study will discuss about the parameters which may effect on foreign direct investment and we will meet with the definition of these parameters. In chapter two, there are some theories about foreign direct investment which help us to have a clear idea about foreign direct investment.

Chapter 3:

In chapter 3, there is a description about how we will analyze our data and how we can relate our data, in addition which technique we use for analyzing.

Chapter 4:

Chapter 4 presents the results and will show the effect of each independent variable on foreign direct investment in emerging countries.

Chapter 5:

Chapter 5 is conclusion and it will present a short summary about the relation of our variables and effect of each independent variable on dependent variable (foreign direct investment).

# Chapter 2

# LITERATURE REVIEW

## 2.1 Foreign Direct Investment

Foreign direct investment is a direct investment into services or production in foreign country or buying a foreign company and using its production line, (existing production line). There are many reasons for doing foreign direct investment such as:

1: Free tax

2: Free tariff

3: Cheaper transportation cost

4: Access to endowment

5: Policy of target country

Foreign direct investment is not limited to the productions and includes investment in the securities of target country such as bonds and stocks.

One of the important factor for increasing foreign direct investment is having open economy, it means that having very small barriers to FDI. The best example for open economy is United State of America (Blaine, 2008).

### 2.1.1 Comparative Advantage

Comparative advantage theory devised by Ricardo and he said that comparative advantage is the ability of producing goods and services with lower cost when we compare the cost in other country. Now this study wants to relate this theory with

foreign direct investment. When one country specialized in one good or service it means that the cost of producing of that product in that country is lower than other countries and it's attractive for foreign investor to use lower cost. So the foreign investor enters to the production line of the countries which are specialized in producing one good. However we must know that foreign investor bid more than domestic investors to catch a firm (Porter, 1998).

### 2.1.2 First Mover Advantage

Reymond Veron presented the theory of first mover advantage. It means that the company which presents one good or service for the first time in the world can use the benefit of early entry in market and it called first mover advantage. Now we have to focus on product life cycle. The new product present by developed country. At first that product is used in domestic market, but after a short time other developed countries show their needs to that product, so they invest in those developed countries. After that global need for that product will be appear. At this time, there is a shifting in production line, to developing countries to use the benefit of low cost of production (Marvin B. and Montgomery, David B. Lieberman , 1988).

### 2.1.3 Local Specific Advantage

The endowments in different countries are different and each product needs some resources. However some of these resources are not available in domestic country and the cost of transportation are too much, so these are the reasons for investing in other countries to use the resources of those countries without the cost of transportation. In some developing countries there are many resources, however we cannot find the technological know-how in those countries or we see the lack of management. So developed countries invest in those developing countries and it is useful for both developed and developing countries because the developed country

use the resources and the technological know-how shift to developing countries (Stoll, 1998).

### 2.1.4 Advantage and Disadvantage of Foreign Direct Investment

As we know in foreign direct investment we have two kinds of countries: Home country and Host country.

Home country is that country which invests in other country to use resources or low cost labor to produce production with lower cost and lower price to achieve comparative advantage (Keillor, 2011).

The country which other country invest in it is host country.

### 2.1.5 Advantage for Home Country

1: Using resource

2: Low cost

3: Low price

4: Comparative advantage

5: Achieving large share of market (Poelhekke, 2010).

### 2.1.6 Disadvantage for Home Country

1: The money which invest in host country negatively effect on the balance of payment of home country. Because of the home country produce its product in host country; it must export its product to home country and foreign direct investment substitute for export.

2: Decreasing jobs in home countries and lots of jobs do by foreign labors.

### 2.1.7 Advantage for Host Country

1: Positive effect on balance of payment of host country because of entering foreign currency from home country.

2: Shifting the technological know-how from home country to host country.

3: Increasing jobs in host country.

4: Better living conditions.

5: More export.

6: Less import.

### 2.1.8 Disadvantage for Host Country

1: Intervention of government for higher competition.

2: Negative balance of payment for host country when the firm (foreign firm) imports a lot of goods from other countries (Because out flow of capital).

### 2.1.9 FDI and Government Intervention

As we explained before, foreign direct investment has advantages and disadvantages on both home and host countries. So it will effect on the economics of both home and host countries. These effects may be positive or negative. Sometimes these effects are so large and it is the reason for intervene of governments of each country. Now we want to meet with some strategies which governments apply to support or discourage foreign direct investment (Peng, 2010).

### 2.1.10 The Strategies Which Governments Apply

1: Government –backed insurance for supporting domestic firms to use foreign direct investment by decreasing risks.

2: Some countries eliminate double taxation for foreign income.

3: Some countries place some options for foreign investors to motivate them to in their country.

On the other hand, governments apply some policies to reject foreign direct investment. For example home government may increase tax for transferring more profit to domestic country, or governments block investing in specific countries because of political reasons.

However, the most popular form for restriction of foreign direct investment is ownership restrain. Ownership restrains usually is applied for important industries such as military and energy. Some governments require a specific percentage of domestic employment. This strategy is performance requirements. (Peng, 2010)


Figure 1. FDI in Argentina.

As the figure shows FDI (as % of GDP) increase rapidly in 1998 and after that there was a negative slope in the FDI (as % of GDP) in Argentina and, however after 2001 the amount of FDI did not change a lot.

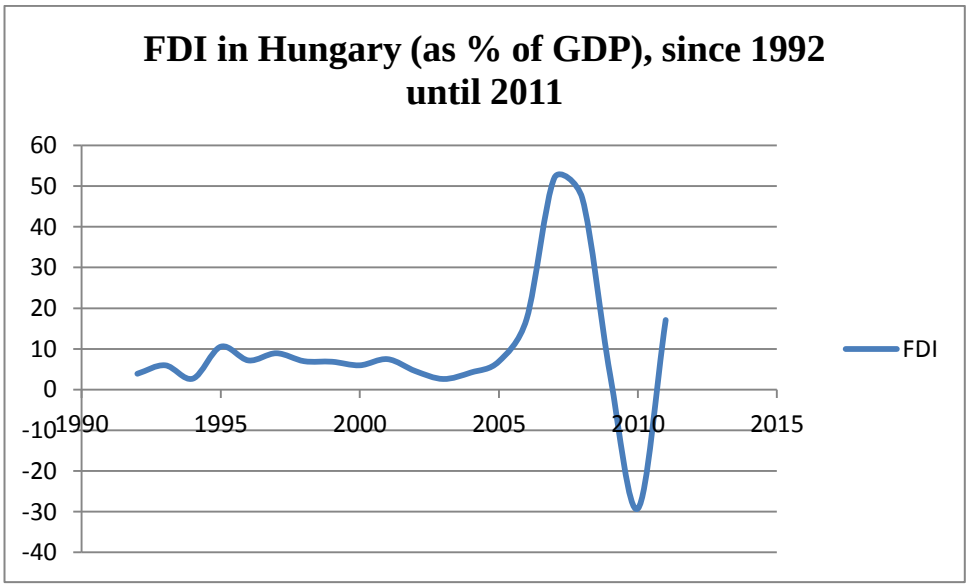


Figure ٢ . FDI in Hungary.

Before 2005 the amount of first was (approximately) constant in Hungary, but after 2005 we can see a high positive slope in FDI until 2007 and after that there was decrease in amount of FDI in Hungary, however again, after 2010 the amount of FDI increase in Hungary.

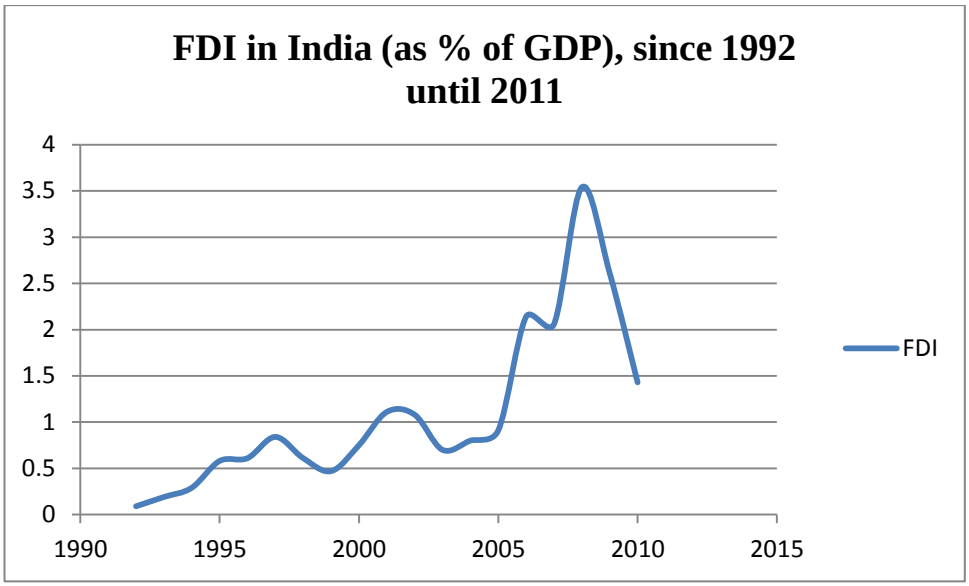


Figure 3. FDI in India.

As the figure shows the slope of FDI is not too much until 2005 in India but after 2005 the amount of FDI (as % of GDP) increase the maximum amount of FDI belong to 2008 and after that we can see a high negative slope on amount of FDI.

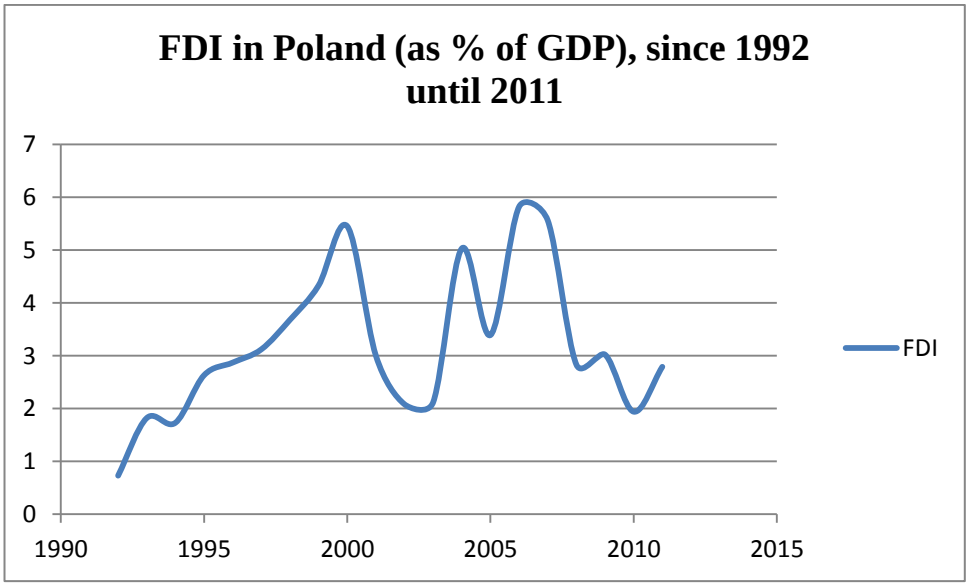


Figure 4. FDI in Poland.

The figure shows that FDI (as % of GDP) increased in Poland until 2000; however since 2000 until 2002 the amount of FDI (as % of GDP) decreased a lot. On the other hand the maximum amount of FDI in Poland belongs to 2007 and after that again the amounts of FDI (as % of GDP) decrease rapidly.

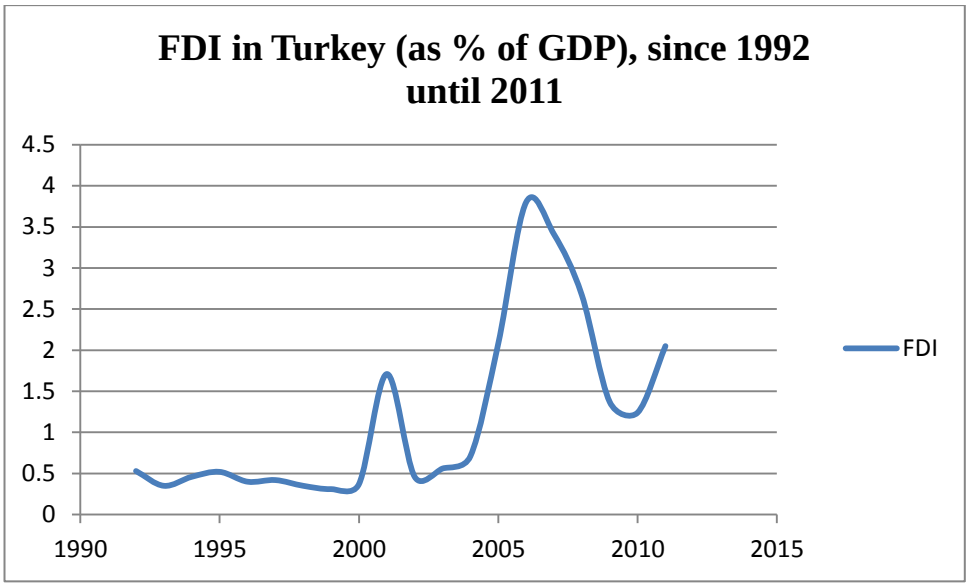


Figure 5. FDI in Turkey.

Since 2004 until 2006 the amount of FDI (as % of GDP) increased rapidly in Turkey and after that until 2010 declined, however after 2010 again there is positive slope in amount of FDI (as % of GDP).

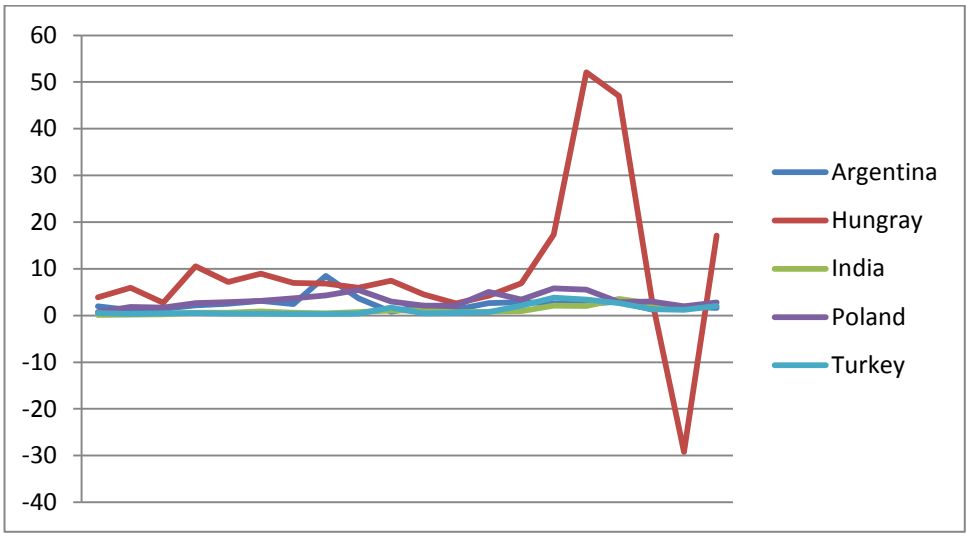


Figure 6. FDI in selected countries (as % of their GDP), since 1992 until 2011

## 2.2 Economic Growth

Economic growth means increase GDP from one period of time to another period of time and it usually calculate annually. GDP increases when the produce of goods and services increase. So the important factor for economic growth is having economic

capacity to produce more. For having economic capacity to produce more, the country needs to have access to highest technology and be aware to technological changes. One of the best indicators which show economic growth is quality of life for people who live in the country. If the quality life and standards of living in one country it means that, that country has economic growth in that period of time (Cohen, 2007).

### 2.2.1 Impact of Economic Growth on Foreign Direct Investment

When we see economic growth in one country we can say that, the country have the capacity to produce more and for producing more the country needs to reduce the cost of production to use comparative advantage and win in competitive market. For reducing the costs the country needs to shift its production line to the countries which the cost of production such as labor and raw materials in those countries are lower than domestic country. On the other hand, emerging countries which have high economic growth can be more attractive for investors. As we discussed before, one result of economic growth is higher technology, and higher technology can attract foreign investors (Cohen, 2007).

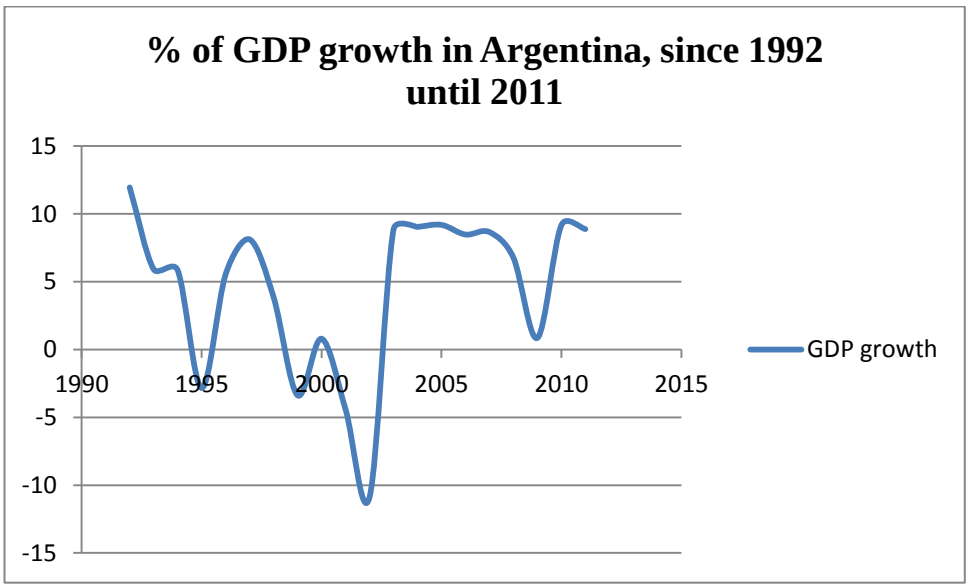


Figure 7. GDP growth in Argentina.

As the figure shows the maximum growth rate of GDP in Argentina belongs to before 1993 and the minimum amount of GDP growth belongs to 2002 on the other hand in 1995, 1994 and 2002 GDP growth in Argentina was negative.


Figure 8. GDP growth in Hungary.

The maximum amount of GDP growth in Hungary belongs to 2004. (Since the country joined to EU) In 2009 the growth rate in Hungary was negative and it was the lowest amount of GDP in last two decades. Hungary's government adjusted convergence programmed update, which include new plan for the correction of excessive deficit by 2009.

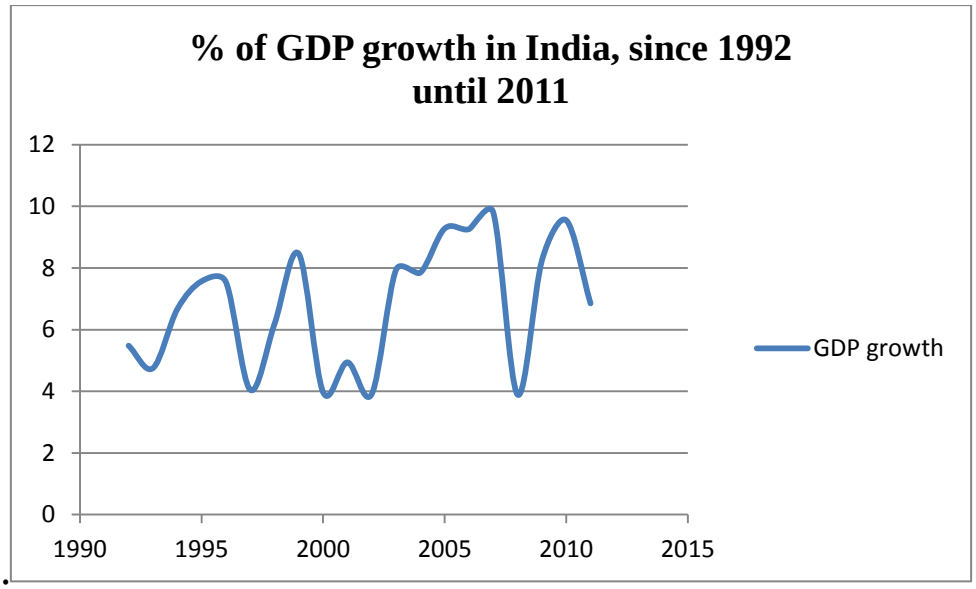


Figure 9. GDP growth in India.

As this figure shows GDP growth rate in India in always positive, however the maximum growth rate of GDP in India belongs to 2007 and the maximum belong to 2002.

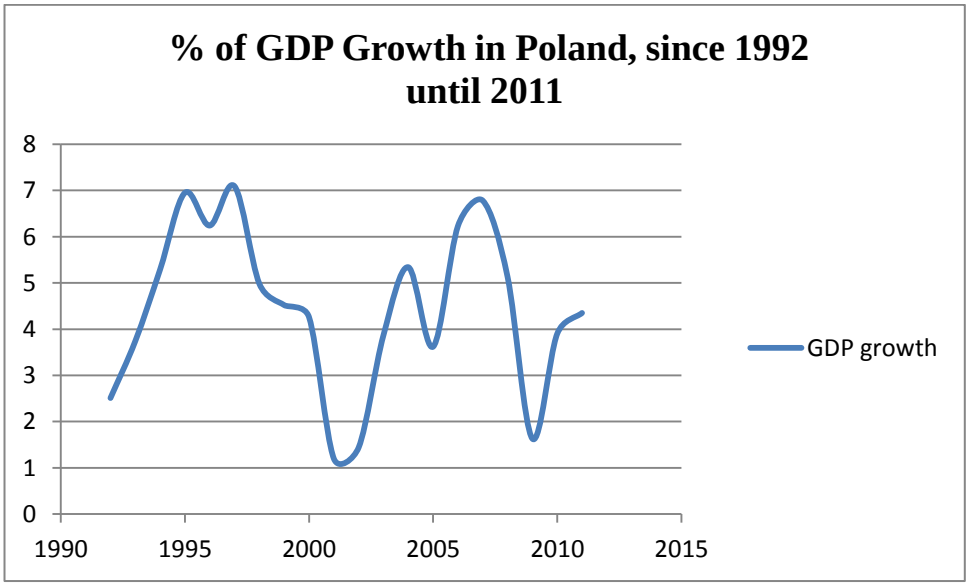


Figure 10. GDP Growth in Poland.

Growth rate of GDP was always positive in last two decades in Poland like India. But between 2000 to 2001 and 2008 and 2009, we can see a high decline of GDP

growth in Poland and the minimum amount of GDP in Poland belongs to 2001 and the maximum is for 1997.

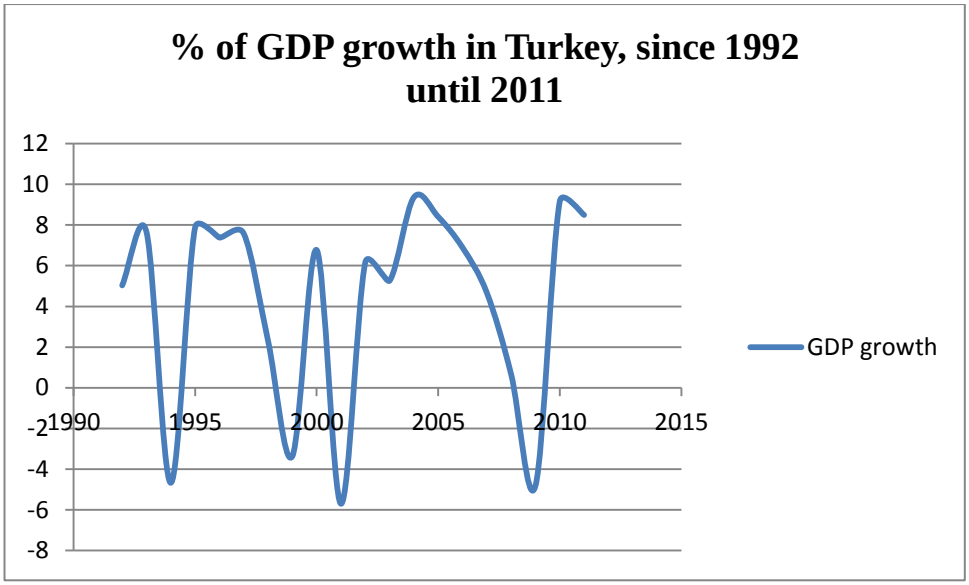


Figure 11. GDP growth in Turkey.

GDP growth in Turkey was negative in 1993, 1998, 2002 and 2008, however the minimum amount of GDP growth is for 2002 and the maximum amount of GDP growth in Turkey belongs to 2004.

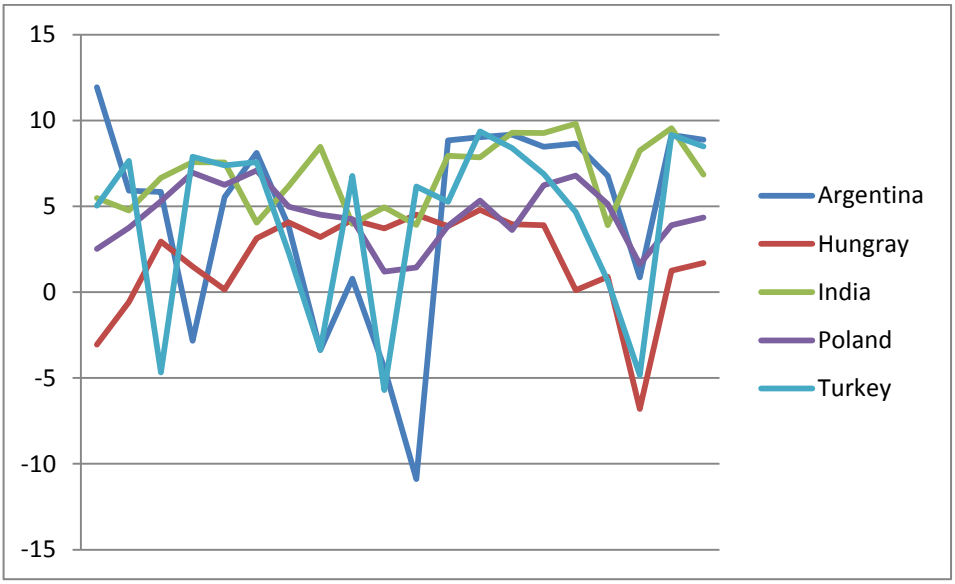


Figure 12. % of Growth Rate of GDP in sample countries, since 1992 until 2011.

## 2.3 Macro Stability

Macro stability means that national economy decrease the effect of external shocks and the result of macro stability is sustaining growth.

External shocks include:

1: Currency fluctuation

2: Interest fluctuation

Based on IMF and EUs definition of macro stability, there are five variable for measuring macroeconomic stability:

1: Low and stable in inflation.

2: Low long term interest rate.

3: Low national debt relative to GDP.

4: Low deficits.

5: currency stability.

These variables can show the position of selected country in global market and the risk of investing in that country in short term and long term (McAleese, 2004).

### 2.3.1 Impact of Inflation Rate on Foreign Direct Investment

As a matter of fact, inflation rate determine the shape of people life and people life can show the position of country in the world. If the inflation rate be low, the standards of living increase and the value of domestic currency will increase. So the economic growth will happen. As we see before when the economic growth happen, the country will increase its production, so it needs to use foreign direct investment. On the other hand, emerging countries with low inflation rate are more attractive for foreign investors because of low fluctuation of their currency, stable economic

environment which exist in those countries and their economic growth, which can reduce the risk of investing.

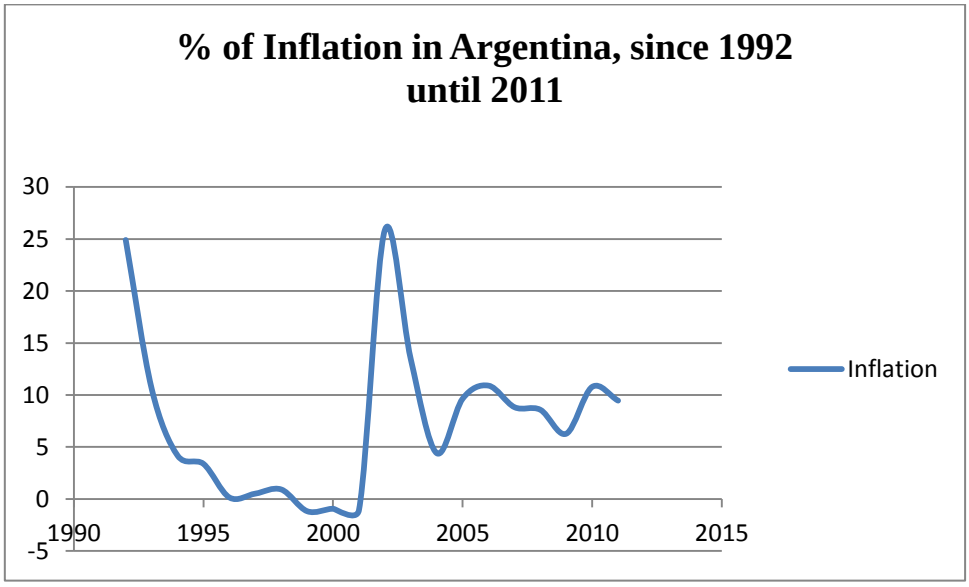


Figure 13. Inflation in Argentina.

Since 1998 until 2001 inflation rate in Argentina was negative, however in 2002 inflation rate in Argentina increase a lot because of currency crisis that happened in that years. On the other hand since 1992 until 1994 and since 2002 until 2003 the inflation rate in Argentina declined.

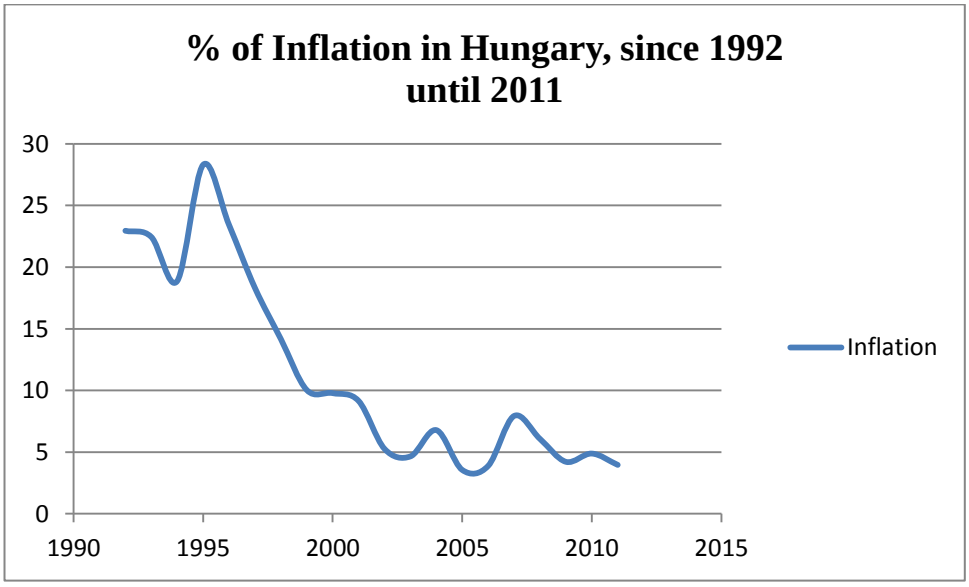


Figure 14. Inflation in Hungary.

As the figure shows the inflation rate in Hungary decreased a lot since 1996 until 1999. In 1989 privatization in Hungary started. GDP decreased and inflation accelerated however in 1995-1996 the recovery started.

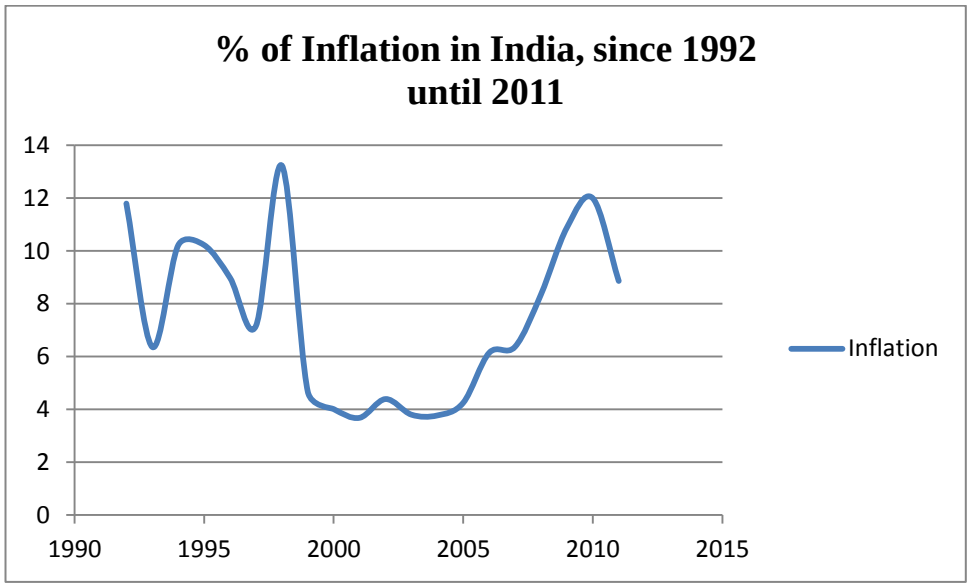


Figure 15. Inflation in India.

The minimum inflation rate in India was for 2001 and maximum inflation rate belongs to 1998 however since 1998 until 1999 the inflation rate in India decreased a lot.

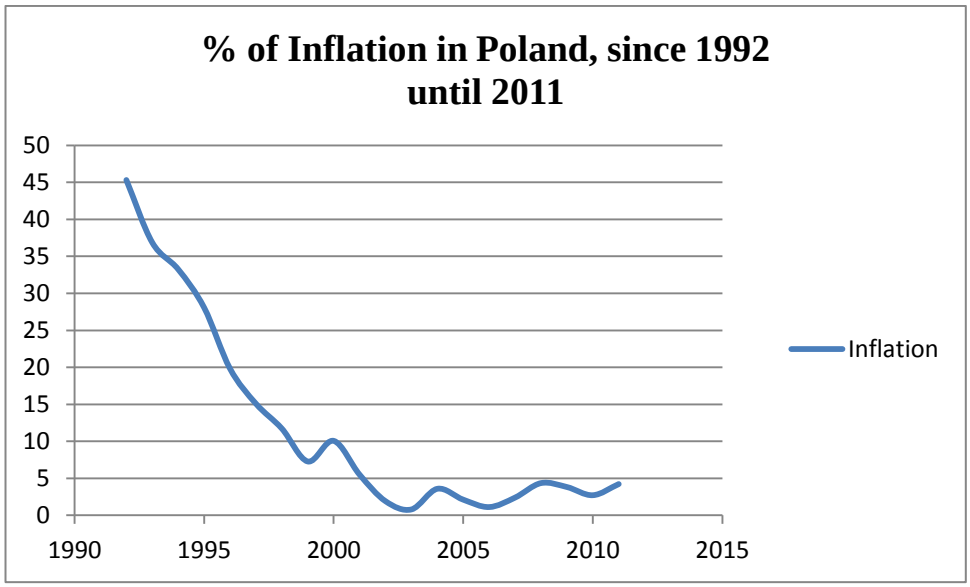


Figure 16. Inflation in Poland.

As the figure shows the inflation rate in Poland was over 45% in 1992 and decreased until 2004. However inflation rate in Poland was under 5% since 2002 until 2011 and the inflation rate in Poland was recorded at 1.70% in January of 2013 being a member of European is one of the reasons for decreasing inflation rate in Poland.

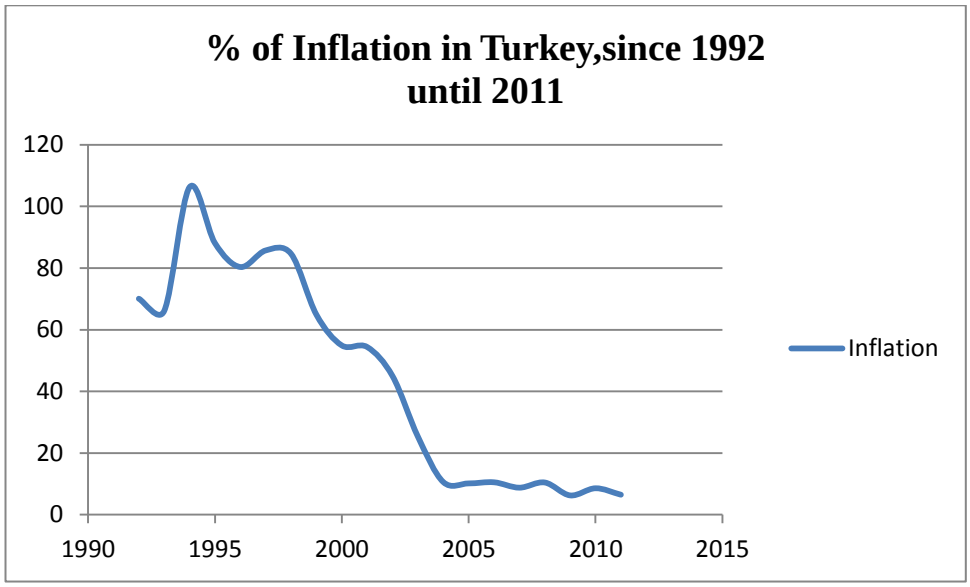


Figure 17. Inflation in Turkey.

We can say that inflation rate in Turkey was constant since 2004 to 2011 and it was around 10% how the maximum amount of inflation rate in Turkey belongs to 1994 and it was over than 100%. In 2005 Turkey dropped six zones from it 8 currencies. The decline in Turkey's inflation is because of contraction monetary policy, fiscal policy and decline in Budget Deficit.

## 2.4 Openness

Openness means that having low barriers with other countries for trading and investing. Openness is one of the most effective factors for foreign direct investment because the country with low barriers can use the low tariffs and low tax and etc., for investing in target country (Long, 2004).

For calculating openness we use two parameters: IMPORT and EXPORT

OPENNESS= IMPORT+EXPORT (as a percentage of GDP)

### 2.4.1 Impact of Openness on Foreign Direct Investment

As we know, openness means decreasing barriers for import and exports more. When a country reduces its barriers with other countries, it can transfer its productions and other things with no or low tax and it will find new area which can invest in it with low cost and it can reduce its price to win in competitive market.


Figure 18. Openness in Argentina.

The amount of export and import increased in Argentina since 2001 until 2002 (because employment has been recovering very quickly since the end of 2002 and poverty has decreased substantially).

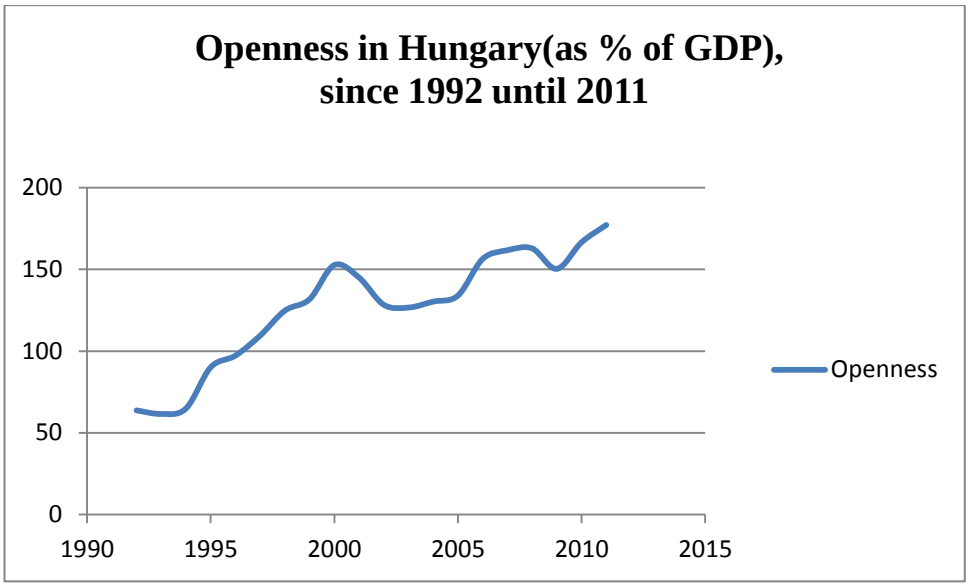


Figure 19. Openness in Hungary.

As the figure shows since 1994 until 2000 experienced liberalization in market in 1990 and changed its economy from socialist economy to market economy and it is a member of OECD since 1995, a member of EU since 2004 and a member of WTO since 1990.

OECD (Organization for Economic Cooperation and Development)

WTO (World Trade Organization)

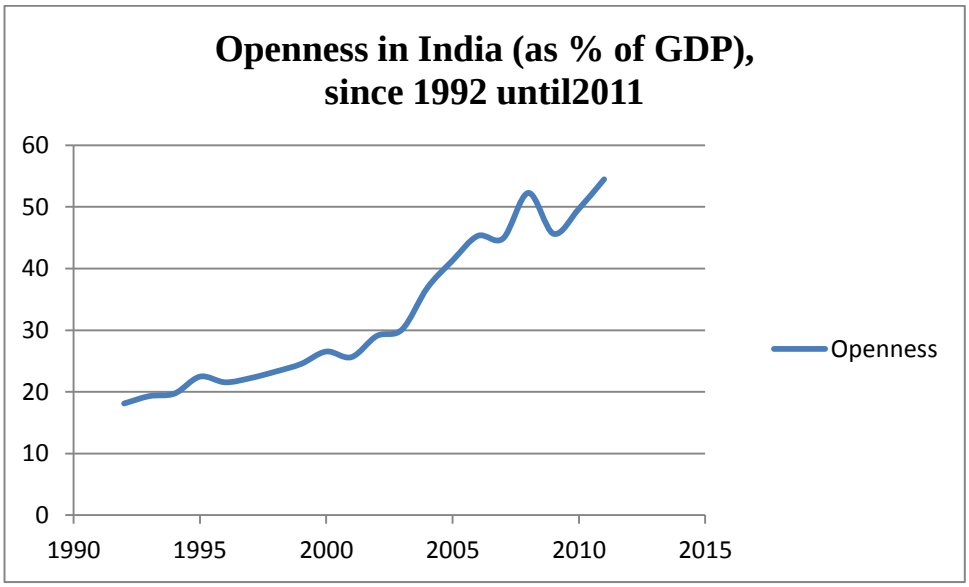


Figure 20. Openness in India.

The figure shows that since 2003 import and export have increased. The reason is service export have opened up new chance since liberalization started and exporting business s services and software services helped India to increase the amount of its export.

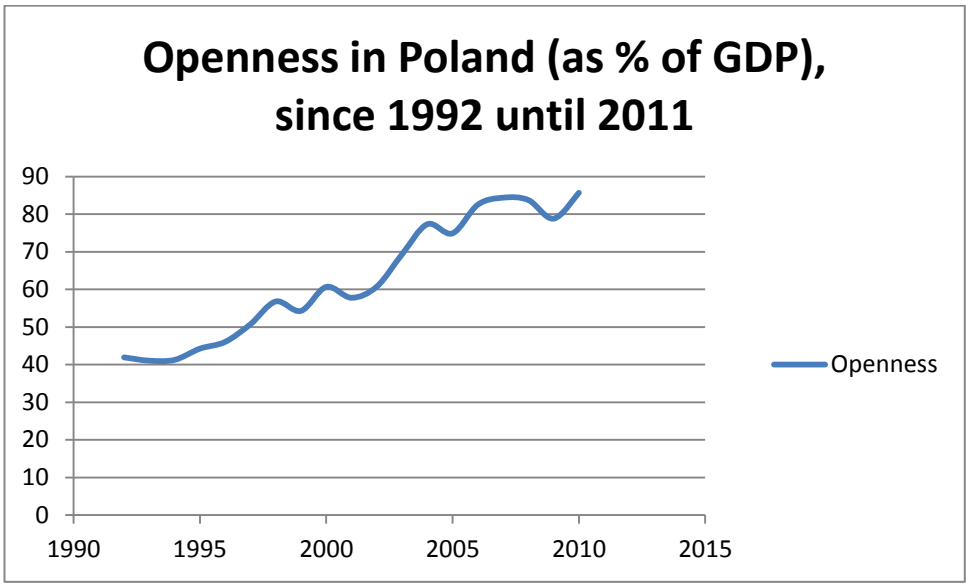


Figure 21. Openness in Poland.

As we see in this figure, we can say that the amount export and import as a percent of GDP is increasing and the maximum amount of openness belongs to 2011.

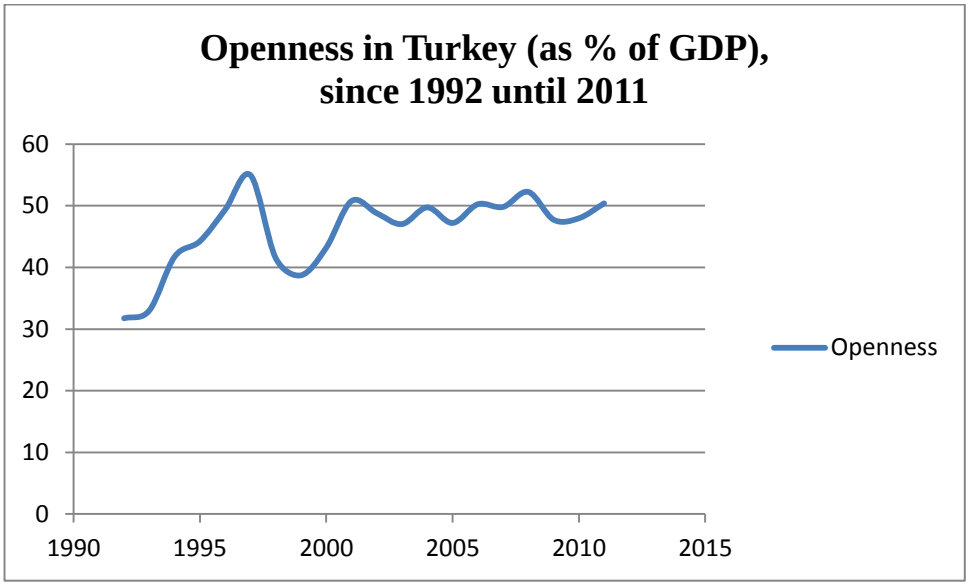


Figure 22. Openness in Turkey.

The maximum degree of openness is for 1997, after that 1999 openness decline, however since 2002 until 2011 degree of openness didn't change a lot in Turkey.

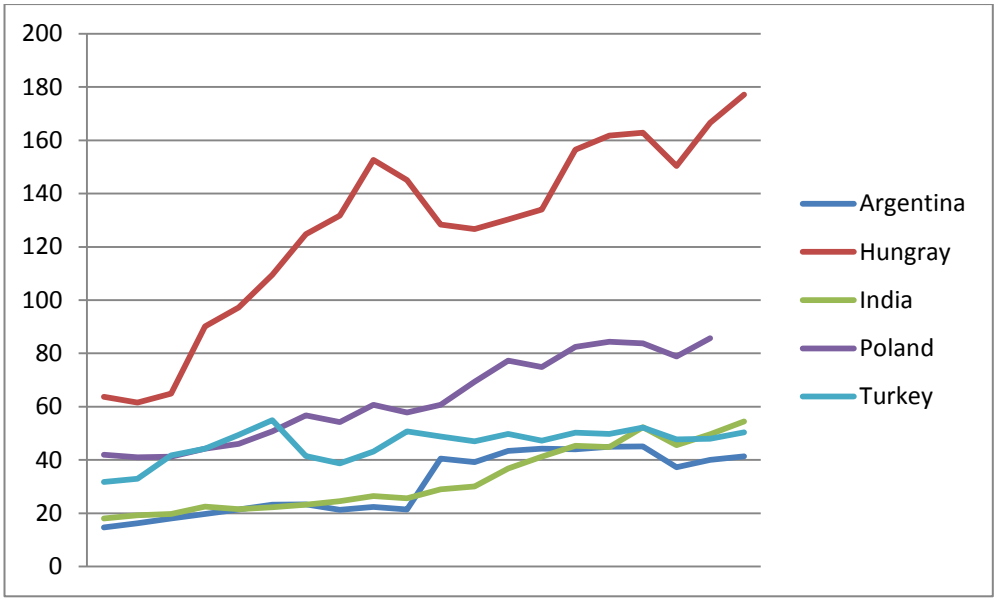


Figure 23. Openness (as % of GDP) in selected countries, since 1992 until 2011.

## 2.5 Financial Development

Financial system can increase economic growth through these two channels:

1: Increasing the available resources to financial investment. (Mobilizes saving)

2: Supervising and helping investment project.

In the other words, the countries which are developed more in domestic financial market are better in supervising investment project and mobilizing saving which guide to increasing economic growth (Gabriel, 2013).

### 2.5.1 Effect of Financial Development on Foreign Direct Investment

The important result of financial development is introducing new technology. Having new technology is one of the basic instruments to produce. So the country with new technology is ready to invest and as we know for winning in competitive market, the country needs to reduce its cost, so it will invest in countries low cost of production.

On the other hand, technological growth will decrease the cost of production. Now we can say that financial development increase the amount of foreign direct investment by introducing new technology (Durham, 2004).

In this study we measure Financial Development by this formula:

Financial Development = last year's total credit to private sector / GDP


Figure 24. Financial Development in Argentina.

The economic crisis happened in Argentina since 1999 until 2002 and as the figure shows a declined happened in financial development in Argentina since 1999. So we can say that economic crisis had negative effect on financial development in Argentina.

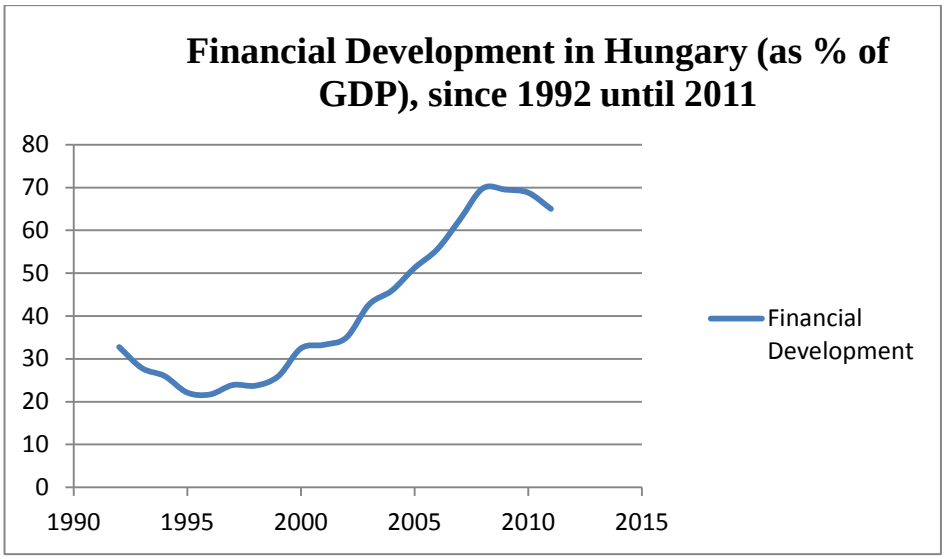


Figure 25. Financial Development in Hungary.

In December of 2002 head of European Union in Denmark officially invites Hungary to be a member in 2004 and as the figure shows financial development had increased since 2002 to 2008.

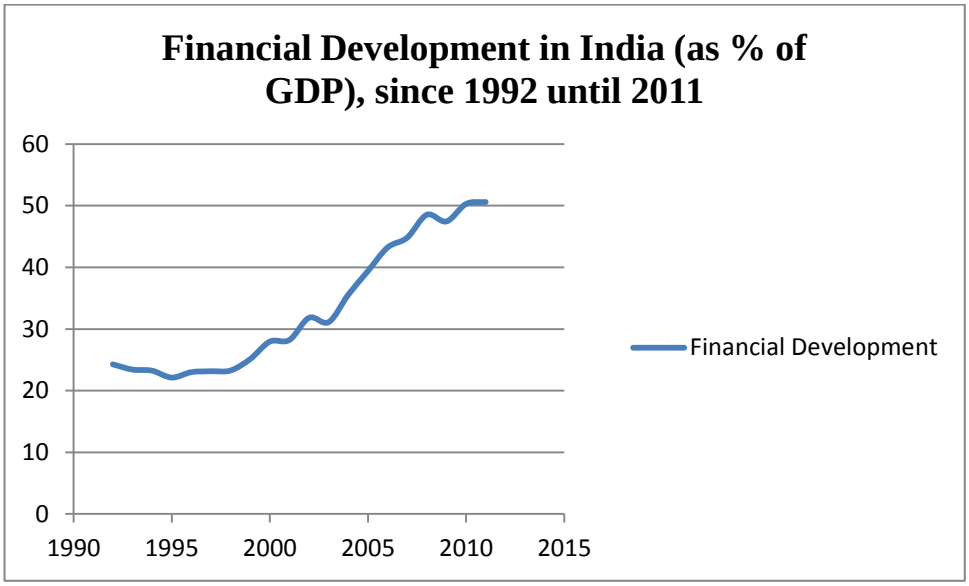


Figure 26. Financial Development in India.

The new private-sector bank is one of the reasons for increasing financial development in India. New private-sector banks are the bank which started their operation after 1991. With the background of financial sector reforms an economic reform.

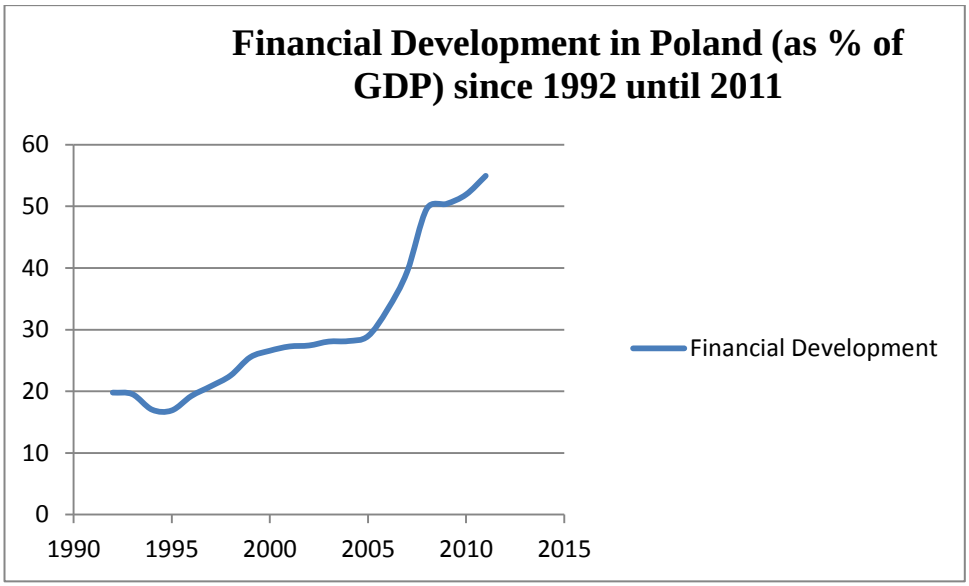


Figure 27. Financial Development in Poland.

Since 1992 to 1997, Poland changed its orientation to a market-oriented country and some banks privatized by government. On the other hand, the rest recapitalized by government and present legal reforms which the sector competitive.

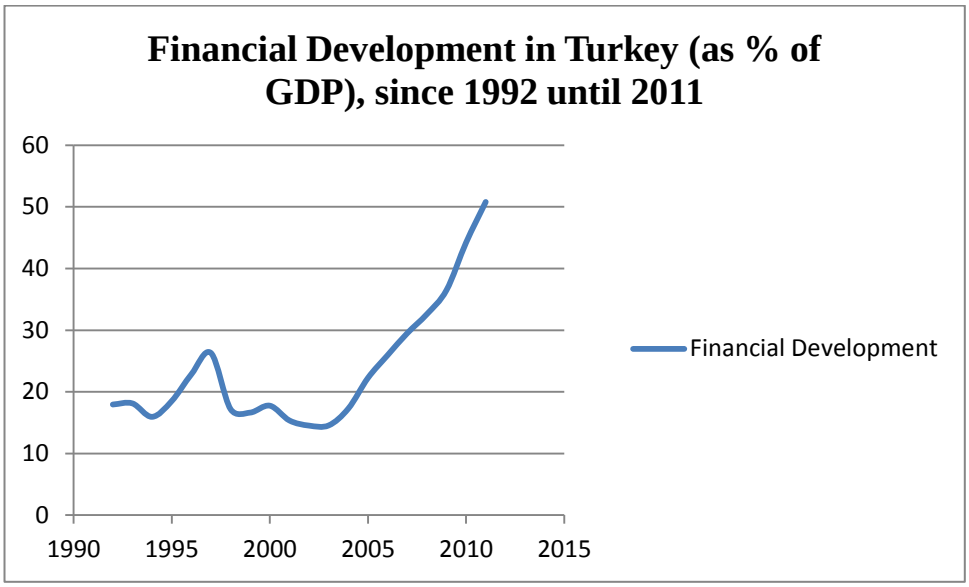


Figure 28. Financial Development in Turkey.

As the figure shows since 2003 financial development has increased. In 2003 Turkey experienced 5.9% growth rate which was more than long-run average rate of 4.1% and the target of 8%. The main sources of finance where developing in the loans of

banking system, higher foreign borrowing by non-bank and bank sector and increase in net errors.

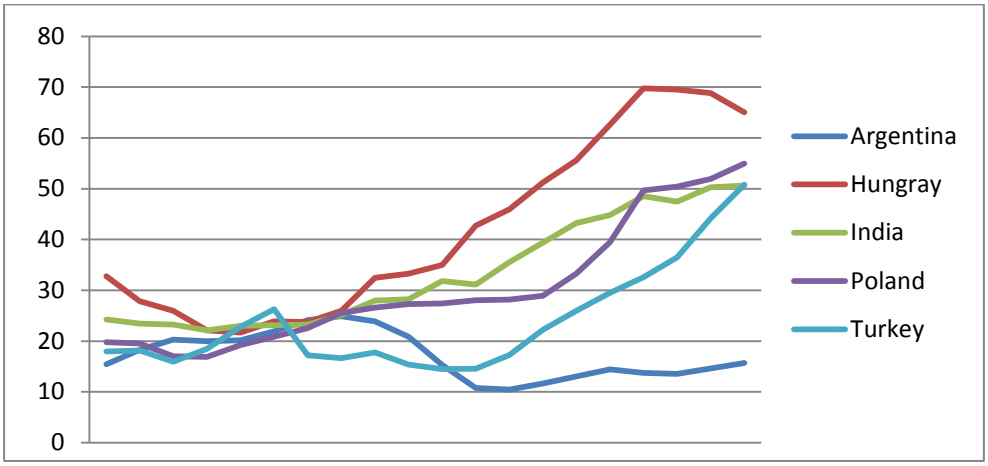


Figure 29. Financial Development in selected countries (as % of GDP), since 1992 until 2011.

# Chapter 3

# METHODOLOGY, DATA AND HYPOTHESIS TO BE TESTED

## 3.1 Regression Analysis

Regression analysis technique is used to modeling variables and it will show the relation between dependent variable and independent variables. In addition it shows how much the dependent variable will change if any independent variable changes and other be constant. Sometimes if the independent variable increases the dependent variable decrease and the negative sign of independent variable will show this relation.

A linear regression model is usually like this:

$$Y= \alpha + \beta X + \varepsilon$$

If the number of independent variable be more than one, the right side of equation will change. For example if there are two independent variables, the equation will be like this:

$$Y=\alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

It is obvious that this equation is linear in factors of$\beta_1 and \beta_2$, there are no limitation on how Y and X relate to the original explained and explanatory variables of interest. However the left side of equation will be constant because, there is just one dependent variable and the equation will show the effect of independent variables on dependent variable.

ε is error, and it assumed to have value equal zero and nonzero value foe error could be related into α. On the other hand it is undertake that ε is independent of X.

There are many kinds of techniques which used for carrying out regression analysis. The most familiar and easiest method is ordinary least square. OLS will decrease the sum of squared vertical distance between the responses predicted and observed responses and at last it will give us a simple equation that presents the results.

Existence of the coefficients in the equation is the sign of relation among dependent and independent indicators. For finding reliable results we are not allowed to use correlated variables.

There are some problems by applying least squares technique. Least squares may present badly when there are some data which are far from the average interval, and the solution is dropping those kinds of data.

### 3.1.1 Pooled Regression Analysis

Pooled regression analysis is statistical method and usually applied in econometrics which relates with two-dimensional panel data? Data which include time series observation of number of individuals is panel data.

### 3.1.2 Three Types of Data Sets Which Are Applied in Economics

1-Time series – the most frequent forms of data which is accessible simply.

2-Cross Section – This data usually is noted over geographic or demographic groups.

3-Panel Data – This model has combination the two above forms. There is a cross section, but cross sectional observation is happened over the time

Panel data (Longitudinal data) is a statistical method that is applied by epidemiology, econometrics researchers. Panel analysis is a suitable method to examine group of people considering the time dimension of data.

Panel data regression can be like this:

$$Y_{it}=a + bX_{it}+\varepsilon_{it}$$

Where:

X is independent variable

Y is dependent variable

i is individual index

$\varepsilon_{it}$ Is the error

a, b are coefficients

## 3.2 Points

Based on statement about the error term, we must to present fixes effects and random effects. So $\varepsilon_{it}$ is very important in panel data.

In random effects, error is supposed to vary stochastically over i or t, however in fix effect error is supposed to vary non-stochastically over i or t.

## 3.3 Data

Economic indicators that are selected as variable for conducting regression analysis are Inflation Rate, Growth Rate of GDP, Financial Development and Openness. The data are related to 1992-2011 for five countries Argentina, Hungary, Poland, India and Turkey. The total number of observations is 500.

## 3.4 Hypothesis to Be Tested

a) Does Inflation rate have negative effect on Foreign Direct investment? ( or it has positive effect)

b) Does GGDP have positive effect on Foreign Direct Investment? ( or it has negative effect)

c) Does Financial Development have positive effect on Foreign Direct Investment? ( or it has negative effect)

d) Does Openness have positive effect on Foreign Direct Investment? ( or it has negative effect)

So:

e) H□0: Inflation has positive effect on FDI

H1: Inflation has negative effect on FDI

f) H0: Growth Rate of GDP has negative effect on FDI

H1: Growth Rate of GDP has positive effect on FDI

g) H0: Financial Development has positive effect on FDI

H1: Financial Development has negative effect on FDI

h) H0: Openness has positive effect on FDI

H1: Openness has negative effect on FDI

# Chapter 4

# POOLED REGRESSION RESULTS

In this chapter we put the all data for the five countries (Argentina, Hungary, India, Poland, and Turkey) in one table in excel. This table includes Inflation, GDP Growth, Financial Development, Openness and Foreign Direct Investment since 1992 until 2011. For finding the relation between data, the excel table will imported to another software which is E-views. The output of E-views program is the regression formula, which shows the relation between data and R-squared. On the other hand E-views provide T-Statistic and Probability. For finding the level of significant for each independent variable, we have to use T-Statistic or Probability.

The important output of E-views is Coefficient which shows the amount of effect of each independent variable on dependent variable. If the coefficient be positive, the independent variable has positive effect on dependent variable, and if the coefficient be negative, the independent variable has negative effect on dependent variable.

In this chapter:

- T-value of each estimated coefficient written in parenthesis under it.
    a. If the coefficient is significant at 10% ⟶ t-value is marked with one star (t-value)*
    b. If the coefficient is significant at 5% ⟶ t-value is marked with two stars (t-value)**

c. If the coefficient is significant at 1% → t-value is marked with three stars (t-values)***

- FDI (1) is: One year lagged value of FDI (as a % of GDP)
- FDI (2) is: Two years lagged value of FDI (as a % of GDP)
- FDI (3) is: Three years lagged value of FDI (as a % of GDP)
- GGDP is: Growth Rate of GDP.
- INF is: Inflation Rate.
- OP is: Openness.
- FD is: Financial Development.
- FDI is: Foreign Direct Investment.
- INF (1) is: One year lagged value of inflation.
- OP (1) is: one year lagged value of openness (as % of GDP) .
- FD (1) is: one year lagged value of financial development (as % of GDP).

## 4.1 Effect of FDI (1), FDI (2), FDI (3), INF (1), FD (1), and OP (1) on Foreign Direct Investment

FDI= -1.660123 +0.984131FDI (1) -0.770405FDI (2) +0.0217571FDI (3)
(5.60)*** (-3.94) *** (1.52)
-0.013036INF (1) +0.061322FD (1) +0.036662OP (1)
(-1.47) (2.09)** (2.73) ***
R-squared= 0.842739 Adjusted R-squared=0.830485

S.E. of regression= 3.167925

So:

1% increase in FDI (1) leads to 0.984121% increase in FDI (as % of GDP).

1% increase in FDI (2) leads to 0.770405% decrease in FDI (as % of GDP).

1% increase in FD (1) leads to 0.061322% increase in FDI (as % of GDP).

1% increase in OP (1) leads to 0.036662% increase in FDI (as % of GDP).

Inflation is INSIGNIFICANT

FDI (3) is INSIGNIFICANT

Openness of last year is significant at 1% level.

Financial Development of last year is significant at 5% level.

## 4.2 Effect of FDI (1), FDI (2), FD (1) and OP (1) on Foreign Direct Investment

FDI= -4.784760 +0.542594 FDI (1) -0.511441 FDI (2) +0.143682 FD (1)
(3.77)*** (-3.25) *** (5.05) ***
+0.075759 OP (1)
(3.15)***
R-squared=0.762398 Adjusted R-squared=0.751084

S.E. of regression=3.733708

So:

1% increase in FDI (1) leads to 0.542595% increase in FDI (as % of GDP).

1% increase in FDI (2) leads to 0.511441% decrease in FDI (as % of GDP).

1% increase in FD (1) leads to 0.143683% increase in FDI (as % of GDP).

1% increase in OP (1) leads to 0.075759% increase in FDI (as % of GDP).

Financial Development of last year is significant at 1% level.

Openness of last year is significant at 1% level.

## 4.3 Effect of FDI (1), FDI (2), FDI (3), FD (1) and OP (1) on Foreign Direct Investment

FDI= -2.071529 +0.986826 FDI (1) -0.769594 FDI (2) +0.221841 FDI (3)
(5.66)*** (-4.00) *** (1.57)
+0.071361 FD (1) +0.034765 OP (1)
(2.55)** (2.68) ***
R-squared=0.841438 Adjusted R-squared=0.831272

S.E. of regression=3.160563

So:

1% increase in FDI (1) leads to 0.986826% increase in FDI (as % of GDP).

1% increase in FDI (2) leads to 0.769594% decrease in FDI (as % of GDP).

1% increase in FDI (3) leads to 0.221841% increase in FDI (as % of GDP).

1% increase in FD (1) leads to 0.071361% increase in FDI (as % of GDP).

1% increase in OP (1) leads to 0.034765% increase in FDI (as % of GDP).

FDI (3) is SIGNIFICANT at 12%

Financial Development of last year is significant at 5%, however we can say that it is significant at 1%, because the probability is 0.0124.

Openness of last year is significant at 1% level.

## 4.4 Effect of FDI (1), FDI (2), FDI (3), INF (1) and FD (1) on Foreign Direct Investment

FDI= -1.114351 +1.101354 FDI (1) -0.808501 FDI (2) +0.292091 FDI (3)
(6.81)*** (-4.21) *** (2.10) **
-0.006264 INF (1) +0.093982 FD (1)
(0.75) (3.41) ***
R-squared=0.829657 Adjusted R-squared=0.818738

S.E. of regression=3.275857

So:

1% increase in FDI (1) leads to 1.101354% increase in FDI (as % of GDP).

1% increase in FDI (2) leads to 0.808501% decrease in FDI (as % of GDP).

1% increase in FDI (3) leads to 0.292091% increase in FDI (as % of GDP).

1% increase in FD (1) leads to 0.093982% increase in FDI (as % of GDP).

Inflation is INSIGNIFICANT.

Financial Development is significant at 1% level.

## 4.5 Effect of FDI (1), FDI (2), FDI (3), GDP, INF, FD and OP on Foreign Direct Investment

FDI= -1.469989 + 0.945534 FDI (1) -0.728370 FDI (2) +0.197937 FDI (3)
(5.25)*** (-3.67) *** (1.41)
-0.122054 GGDP -0.009721 INF + 0.082496 FD +0.036680 OP
(-1.61) (-0.96) (2.38)** (2.77) ***
R-squared=0.847702 Adjusted R-squared=0.833675

S.E. of regression=3.137980

So:

1% increase in FDI (1) leads to 0.945534% increase in FDI (as % of GDP).

1% increase in FDI (2) leads to 0.728370% decrease in FDI (as % of GDP).

1% increase in GGDP leads to 0.122054% decrease in FDI (as % of GDP).

1% increase in FD leads to 0.082496% increase in FDI (as % of GDP).

1% increase in OP leads to 0.036680% increase in FDI (as % of GDP).

FDI (3) is INSIGNIFICANT.

Inflation is INSIGNIFICANT.

GGPP is SIGNIFICANT at 12%.

Financial Development and Openness are significant at 1% level.

# Chapter 5

# CONCLUSION

Regression results present that Financial Development of last year and current Financial Development have positive effect on Foreign Direct Investment. As we know, Foreign Direct Investment has positive effect on growth rate of GDP. So by increasing Financial Development, growth rate of GDP will increase. On the other hand, regression results present that, countries have to improve their domestic financial system before attempting on attract Foreign Direct investment.

Regression results also show that Openness of last year and Current Openness have positive affect on Foreign Direct Investment. It means that by reducing the barriers, decreasing tariffs, or dropping tariffs and improving the transportation ways, the amount of Foreign Direct Investment will increase.

The next variable which effects on Foreign Direct Investment is Inflation Rare. Current Inflation Rate and Inflation Rate of last year have negative effect on Foreign Direct Investment. Inflation Rate and Macro Stability have negative relation. High Inflation Rate in a country means that the Macro Stability in that country is low. So developed countries cannot predict financial environment of countries with high Inflation Rate and do not accept the risk of investing in these countries.

In addition, regression results present that Financial Development has more effect on Foreign Direct Investment rather than Inflation Rate, Growth Rate of GDP and Openness. So emerging countries have to focus on Financial Development and Financial System to attract more Foreign Direct Investment.

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# APPENDICES

## Appendix 1-

Dependent Variable: FDI
Method: Panel Least Squares
Date: 01/02/13 Time: 14:17
Sample (adjusted): 1992 2008
Periods included: 17
Cross-sections included: 5
Total panel (unbalanced) observations: 84
White cross-section standard errors & covariance (d.f. corrected)

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|---|---|---|---|---|
| 0.0000 | 5.253148 | 0.179994 | 0.945534 | FDI(1) |
| 0.0004 | -3.672725 | 0.198319 | -0.728370 | FDI(2) |
| 0.1626 | 1.410033 | 0.140378 | 0.197937 | FDI(3) |
| 0.1109 | -1.612880 | 0.075674 | -0.122054 | GGDP |
| 0.3368 | -0.966694 | 0.010056 | -0.009721 | INF |
| 0.0196 | 2.384718 | 0.034594 | 0.082496 | FD |
| 0.0070 | 2.774601 | 0.013220 | 0.036680 | OP |
| 0.2066 | -1.273911 | 1.153918 | -1.469989 | C |

| | | | |
|---|---|---|---|
| 3.981071 | Mean dependent var | 0.847702 | R-squared |
| 7.694335 | S.D. dependent var | 0.833675 | Adjusted R-squared |
| 5.215428 | Akaike info criterion | 3.137980 | S.E. of regression |
| 5.446935 | Schwarz criterion | 748.3658 | Sum squared resid |
| 5.308492 | Hannan-Quinn criter. | -211.0480 | Log likelihood |
| 2.601926 | Durbin-Watson stat | 60.43176 | F-statistic |
| | | 0.000000 | Prob(F-statistic) |

## Appendix 2-

Dependent Variable: FDI
Method: Panel Least Squares
Date: 01/09/13 Time: 10:12
Sample (adjusted): 1992 2008
Periods included: 17
Cross-sections included: 5
Total panel (unbalanced) observations: 84
White cross-section standard errors & covariance (d.f. corrected)

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|---|---|---|---|---|
| 0.0157 | -2.470960 | 0.838350 | -2.071529 | C |
| 0.0000 | 5.664899 | 0.174200 | 0.986826 | FDI(1) |
| 0.0001 | -4.007566 | 0.192035 | -0.769594 | FDI(2) |
| 0.1188 | 1.577125 | 0.140661 | 0.221841 | FDI(3) |
| 0.0124 | 2.559050 | 0.027886 | 0.071361 | FD(1) |
| 0.0090 | 2.680673 | 0.012969 | 0.034765 | OP(1) |

| | | | |
|---|---|---|---|
| 3.981071 | Mean dependent var | 0.841437 | R-squared |
| 7.694335 | S.D. dependent var | 0.831272 | Adjusted R-squared |
| 5.208127 | Akaike info criterion | 3.160563 | S.E. of regression |
| 5.381756 | Schwarz criterion | 779.1544 | Sum squared resid |
| 5.277924 | Hannan-Quinn criter. | -212.7413 | Log likelihood |
| 2.672102 | Durbin-Watson stat | 82.78330 | F-statistic |
| | | 0.000000 | Prob(F-statistic) |

## Appendix 3-

Dependent Variable: FDI
Method: Panel Least Squares
Date: 01/09/13 Time: 10:13
Sample (adjusted): 1992 2008
Periods included: 17
Cross-sections included: 5
Total panel (unbalanced) observations: 84
White cross-section standard errors & covariance (d.f. corrected)

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|---|---|---|---|---|
| 0.2928 | -1.059215 | 1.052054 | -1.114351 | C |
| 0.0000 | 6.813421 | 0.161645 | 1.101354 | FDI(1) |
| 0.0001 | -4.210637 | 0.192014 | -0.808501 | FDI(2) |
| 0.0389 | 2.101147 | 0.139015 | 0.292091 | FDI(3) |
| 0.0010 | 3.416807 | 0.027506 | 0.093982 | FD(1) |
| 0.4542 | -0.752128 | 0.008329 | -0.006264 | INF(1) |

| | | | |
|---|---|---|---|
| 3.981071 | Mean dependent var | 0.829657 | R-squared |
| 7.694335 | S.D. dependent var | 0.818738 | Adjusted R-squared |
| 5.279785 | Akaike info criterion | 3.275857 | S.E. of regression |
| 5.453415 | Schwarz criterion | 837.0367 | Sum squared resid |
| 5.349583 | Hannan-Quinn criter. | -215.7510 | Log likelihood |
| 2.783638 | Durbin-Watson stat | 75.97996 | F-statistic |
| | | 0.000000 | Prob(F-statistic) |

## Appendix 4-

Dependent Variable: FDI
Method: Panel Least Squares
Date: 01/09/13 Time: 12:00
Sample (adjusted): 1992 2009
Periods included: 18
Cross-sections included: 5
Total panel (unbalanced) observations: 89
White cross-section standard errors & covariance (d.f. corrected)

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|---|---|---|---|---|
| 0.0003 | 3.775303 | 0.143722 | 0.542594 | FDI(1) |
| 0.0016 | -3.254465 | 0.157150 | -0.511441 | FDI(2) |
| 0.0000 | 5.056949 | 0.028413 | 0.143682 | FD(1) |
| 0.0022 | 3.153073 | 0.024027 | 0.075759 | OP(1) |
| 0.0000 | -4.322454 | 1.106954 | -4.784760 | C |

| | | | |
|---|---|---|---|
| 3.902472 | Mean dependent var | 0.762398 | R-squared |
| 7.483656 | S.D. dependent var | 0.751084 | Adjusted R-squared |
| 5.527221 | Akaike info criterion | 3.733708 | S.E. of regression |
| 5.667032 | Schwarz criterion | 1171.009 | Sum squared resid |
| 5.583575 | Hannan-Quinn criter. | -240.9613 | Log likelihood |
| 1.064230 | Durbin-Watson stat | 67.38316 | F-statistic |
| | | 0.000000 | Prob(F-statistic) |

## Appendix 5-

Dependent Variable: FDI
Method: Panel Least Squares
Date: 01/02/13 Time: 14:17
Sample (adjusted): 1992 2008
Periods included: 17
Cross-sections included: 5
Total panel (unbalanced) observations: 84
White cross-section standard errors & covariance (d.f. corrected)

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|---|---|---|---|---|
| 0.0000 | 5.605191 | 0.175575 | 0.984131 | FDI(1) |
| 0.0002 | -3.948074 | 0.195134 | -0.770405 | FDI(2) |
| 0.1316 | 1.523989 | 0.142764 | 0.217571 | FDI(3) |
| 0.1443 | -1.474914 | 0.008839 | -0.013036 | INF(1) |
| 0.0393 | 2.096607 | 0.029248 | 0.061322 | FD(1) |
| 0.0078 | 2.732404 | 0.013417 | 0.036662 | OP(1) |
| 0.1075 | -1.628430 | 1.019462 | -1.660123 | C |

| | | | |
|---|---|---|---|
| 3.981071 | Mean dependent var | 0.842739 | R-squared |
| 7.694335 | S.D. dependent var | 0.830485 | Adjusted R-squared |
| 5.223686 | Akaike info criterion | 3.167925 | S.E. of regression |
| 5.426254 | Schwarz criterion | 772.7529 | Sum squared resid |
| 5.305117 | Hannan-Quinn criter. | -212.3948 | Log likelihood |
| 2.674169 | Durbin-Watson stat | 68.77212 | F-statistic |
| | | 0.000000 | Prob(F-statistic) |