THE IMPACT OF CAPITAL FLIGHT ON ECONOMIC GROWTH

by

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Abstract

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In this study I investigate the impact of capital flight on economic growth. This issue has raised a great discussion in both, theoretical and empirical literature. However, estimates of capital flight for all developing countries in the world have become available only recently. I use this newly available data set, consisting of 139 countries for the period of 2002-2006 and find that capital flight has a negative impact on GDP growth. However, its significance is ambiguous. The results are not robust to specifications, which account for region or year effects.

TABLE OF CONTENTS

LIST OF FIGURES

Number *Page*

LIST OF TABLES

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GLOSSARY

Capital Flight. Illegal conveyance of capital abroad which stays unrecorded in the national accounts.

Capital Export (Outflow). Legal conveyance of capital abroad, which is in a full compliance with all requirements of the law.

Terms of Trade. Relative price of the country's export to import over time under the assumption that both export and import have the same structure.

Capital Formation. Total stock of capital formed in the country in the given period as a share of GDP.

Chapter 1

INTRODUCTION

With the rise of the external debt of transition countries, capital flight out of these countries has also increased. According to the World Bank Residual measure of capital flight, which is defined as a difference between recorded sources of funds and recorded uses of funds, capital flight from developing European countries reached 145 249 million US dollars in 2006, which constituted 44.8% rise to the value of 2005 (Kar, 2008). Similarly, a report of World Financial Integrity Fund, indicates that for the majority of the countries in transition, capital flight exceeds ten percents of GDP (Kar, 2008).. According to another estimate, for Ukraine, from 2004 to September, 2006 the capital flight according to the narrowest Hot Money Method totaled 12.9 billion US Dollars[1].

There exists no generally accepted definition of the term "capital flight". Most of the times this term is related to capital which is shifted out of developing countries. However, if capital shifts out of the developed country, it is usually referred to as capital outflow. Investors from developed countries are seen as responding to investment opportunities while investors from developing countries are said to be escaping the high risks they perceive at home (Ajayi, 1997). Other research separate normal capital outflows (legal flows) of capital

[1] Disappearing Capital. http://czech-transport.com/fne-portal/index.php?aid=295

from capital flight (illegal flows). For the purpose of our research, capital flight is defined as a net illegal outflow of capital from the countries of interest.

Capital flight should be clearly distinguished from the capital export, which consists of conveyance of capital in the full accordance with the law. While capital export is a normal economic phenomenon, which does not harm significantly the economy from the global perspective (capital finds its optimal allocation), capital flight presents a danger and leads to the impoverishment of the economy, worsening the possibility of investments and prospects for further development of the economy (Kosarev, 2000).

There are three main reasons to study the capital flight issue for both developing countries and countries in transition. First, there has been no study performed for the whole world. There was a substantial amount of studies devoted to the influence of capital flight in Sub-Saharan Highly Indebted African Countries. However, as we discuss it later, half of the capital flows out from the Asia region. Moreover, recent estimates of capital flight performed for countries in transition (see, for example, Brada et al. 2008; Kar 2008) highlight the importance and the magnitude of the capital flight for the developing countries and countries in transition in the European region. Thus, it is very interesting to see the overall effect of capital flight, estimated on the global basis.

Second important reason to research the problem of influence of capital flight on the growth of the country is the theoretical notion that the flight of capital is a lost opportunity for the money to work in the country's economy. Moreover, when the capital leaves the country legally, it enters another country legally and can improve its economic condition. However, capital which leaves the country illegally, will not appear in the national accounts of any other country, but rather

will settle down in somebody's pocket. The money fled from the circulation can not produce any additional money in either country.

At last, among others negative consequences of capital flight, researches also note the importance of tax base erosion and the income redistribution problems, created by capital flight (Pastor, 1990).

As the capital flight is an illegal transaction, which aims at avoiding being recorded in official documents, there is no definite measure of the overall amount of capital flight. Thus, researchers have come up with different ways to estimate capital flight. At the moment, there are around five main measures of capital flight, which differ significantly in the methodology used and sometimes diverge significantly in their estimates (Cumby, 1987). As estimating the magnitude of capital flight is a tough task by itself, a lot of studies aim solely at measuring capital flight and do not analyze its consequences.

The main goal of the paper is to measure the effect of capital flight on the growth of real GDP using an available panel dataset, which contains estimates of capital flight by different proxies for all developing countries in the world. In particular, it is of interest to see whether the increasing capital flight really significantly deteriorates the GDP growth. Conceptually, capital flight has a negative influence on the GDP growth through reducing domestic investment. In turn, lower level of domestic investment reduces the capital-labor ratio, which reduces labor productivity and, consequently, the output produced. Capital flight also has an ability to induce negative feedback processes meaning, especially during the periods of uncertainty and crisis. Beja (2006) notes that the issue of capital flight is of great importance nowadays. Particularly, he writes: "As resource constraints become binding, economic growth is further limited. Then more capital flight

could occur. There is also the possibility of being cut off from external sources of funds. Consequently, it becomes more difficult to implement economic policies, and improving the social conditions of people also becomes more difficult."

The model used in the paper is based on the endogenous growth model developed by Michael Hadjimichael (Hadjimichael, 1994). In his research on the determinants of growth Hadjimichael used a whole range of variables to capture the effects of macroeconomic stability on growth. Among them were rate of inflation, private and government investment as a ratio of GDP, the budget deficit (including grants) as a ratio of GDP, percentage change in the real effective exchange rate, growth in real GDP, the rate of inflation, population growth rate. This study analyzes 139 developing countries and countries in transition from all over the world for the period of 2002-2006.

The paper proceeds with the review of relevant literature on the capital flight in Chapter 2. Chapter 3 presents the methodological approach: econometric model used for the analysis and defines main methods of estimating the capital flight. The following two chapters describe the data and estimation results. At last, main conclusions and policy implications are presented in Chapter 6.

Chapter 2

LITERATURE REVIEW

This chapter reviews the main relevant studies on the subject. As, basically every economist is familiar with the growth theory, the background of which is used to measure the effect of capital flight on the economic growth, we will focus our attention in this chapter on the capital flight issue, presenting a short theoretical background of growth models in the next chapter. This chapter goes? in? the following way. It starts with overview of different definition of the capital flight. Then, it presents the measures of capital flight, as well as goes over the studies which tried to estimate empirically the size of capital flights. , it ends by discussing the papers which have measured the effect of capital flight on other macroeconomic variables.

As it was stated earlier, there is no conventional definition of capital flight. For example, some researches include the motivation for the flight in the definition: "acquisition or retention of a claim on non-residents that is motivated by the owner's concern that the value of his asset would be subject to discrete losses or impairment if his claims continued to be held domestically" (Deppler and Williamson, 1987). This definition is similar to Dooley et al. (1994) who defines capital flight as the "accumulation of claims on nonresidents by residents that escape control of the domestic government". For Cuddington (1986) capital flight is short-term private capital outflow which occurs in the response "not only to political crisis but also to economic policy failure". Recent papers provide

somewhat simplified definitions of the capital flight. For example, Schneider (2003) defines it as the outflow of resident capital from a country in response to economic and political risk in the domestic economy. The main subtle point in defining capital flight is whether the researches understand the overall capital outflow from the developing country or country in transition or just an illegal counterpart of it. However, it is quite hard to distinguish between legal and illegal capital flows. For example, the Hot Money Measure, discussed below, is believed to measure only the legal counterpart of the capital flight, while the World Bank Residual Method, the Dooley and the Trade Mispricing models are believed to capture the illegal counterpart of the capital flight.

It is also important to note that capital flight can be originated as by the capital of criminal origin so by the legitimate capital. For example, Kosarev (2000) looks at two different situations: "…legitimately obtained profit entering the flow of capital fleeing abroad in avoidance of taxes becomes the subject of a violation only after its successful illegal conveyance out of the country. And on the other hand, income from drug trafficking or racketeering that is conveyed abroad is criminal right from its origin. Thus capital flight may be associated with an extremely variable degree of offenses depending on the source from which the resources originate."

For the purpose of our research, we will define the capital flight as a net illegal conveyance of capital out of the countries, which is not recorded in the national accounts.

There is a huge gap not only in the definitions of the capital flight, but also in the approaches to measure it. First few approaches were developed in the mid eighties. During that period Cuddington (1986), who focused on the short-term

movements of capital offered a Hot Money measure of estimating capital flight. The main claim made by Cuddington that the regular capital flows, explained by portfolio diversification goals corresponded to long-term flows, while the short term flows consisted the capital flight. In the broadest form, this measure is calculated as a sum of net errors and omissions (NEO) and the recorded capital outflows from the private sector. The narrow measure is defined simply as net errors and omissions from the balance of payments statistics. However, this method is criticized for not capturing the most part of illegal capital flows. There are countries which should have high levels of illegal capital outflow due to the economic and political instability. However, they have zero net errors and omissions entries in the balance of payments (Kar, 2008).

Another approach was developed by Dooley (1986), which is known as a Dooley Method. According to this method capital flight is measured as the part of an increase in external claims that yields recorded investment income which is not reported to the domestic authorities. The main advantage of this method is the ability to differentiate between legal and illegal capital flight, as those assets, which do not generate reported income are believed to be the one, which try to avoid the existing controls and, thus, constituting an illegal capital outflow. While this method produced much larger estimates of capital flow, than the Hot Money Method, the main limitation of this approach is that the data on the short-term private sector capital flows, needed to perform the calculations is no longer available in the balance of payments.

A third approach, which has been widely used by researches, was developed by the World Bank around the same time is called a World Bank Residual Method and is computed as the difference of recorded source of funds and the recorded uses of funds. This broad measure was also used by Morgan Guaranty Bank

(1986), with the only exception in the definition of "uses of funds". Morgan Guaranty Bank also subtracted the increase in the short-term assets of the banking system from the total sources of funds.

Another important approach in estimating the capital flight is called the Trade Mispricing Model and it springs from the fact that for a long time the main channel of transferring funds illegally was through over-invoicing of imports and under-invoicing of exports. Thus, the trade-faking from both activities added together represent the illicit cash flight estimate.

There have been two main literature streams in estimating the capital flight itself. First stream examine the issue of capital flight as a portfolio diversification choice, made by each individual (Zak, 2006; Sheets, 1995). Second stream examines the capital flight as a country-specific phenomenon. While the first stream of researches find an evidence, that the main determinants of the capital flight are inflation rates and financial risks, the second stream find a strong evidence in favor of political uncertainty as a main reason for capital flight (Alesina, 1989; Lensik, 1998). James Boyce provides an extensive overview of the papers, estimating the capital flight (Boyce, 2002).

One of the first attempts to measure the magnitude of capital flight in transition European countries was made by Nathan Sheets, who has evaluated the capital flight for five countries in Central and Eastern Europe for the period of 1988-1993 (Sheets, 1995). Josef Brada, et al. have performed a wider analysis of twelve transition economies of Central and Eastern Europe for the period 1995-2005 (Brada, 2008). However, both papers conclude that the capital flight out of countries in transition is in line with the main explanation of capital flight, which is "driven by differences in interest rates and investors' expectations about future

tax rates, inflation, etc. in their countries as well as by the ease with which they are able to transfer their wealth overseas" (Brada, 2008). The most recent research has been performed by Dev Kar and Devon Cartwright-Smith for the whole range of developing countries and countries in transition in 2002-2006 (Kar, 2008). The authors estimate capital flight using the Hot Money, the World Bank and Trade Mispricing measures. Their estimates of the capital flight for the developing countries are used in the paper to estimate the effect of capital flight on the real economic growth.

Coming to the last part of our literature review, which discussed the effect of capital flight on other macroeconomic variables, it should be noted that the issue of capital flight has been studied from a few different perspectives. There is a stream of research devoted to the analysis of foreign direct investment and capital flight issue. For example, Chander Kant performed factor analysis to see how capital flight cointegrates with other macroeconomic variables. He finds that up to 40% of government-guaranteed external borrowings leave the developing countries as capital flight (Kant, 1996). However, there is a less empirical literature on the determination the influence of capital flight on economic growth. The most relevant to us are endogenous growth models, which determine the effect of external debt, and more rarely of capital flight itself, among the other macroeconomic variables. The model, used in this paper is based on the model presented by Michael Hadjimichael. In his paper, the author defines the whole group of factors, influencing the growth, such as: macroeconomic stability (inflation, fiscal and exchange rate policies), trade policy, structural policies, financial intermediation, external debt, terms of trade changes and foreign assistance (Hadjimichael, 1994). Ibi Ajayi (1997) has incorporated the model by Hadjimichael (1994) to estimate the effect of capital flight on the real growth of GDP for Kenya. Her specification included such variables, as growth

domestic investment, inflation rate, percentage change in the real effective exchange rate, percentage change in terms of trade, fiscal deficit as a percentage of GNP, capital flight, debt/export and debt/service ratios (Ajayi, 1997). Another study performed by Edsel Beja, used counterfactual calculations to find that capital flight reduced the economic growth of Philippines from 1 to 2.3 percent between 1970 and 1999 (Beja, 2007). The author uses the same proxy of capital flight as our paper. Thus, it is of our interest to compare the results obtained with this study.

Our research will be able to contribute significantly to the literature on the topic, as the analysis will be performed not for a single country, but for a wide range of developing countries (139) from all over the world, using the recently computed proxies of capital flight by Dev Kar (Kar, 2008).

Chapter 3

METHODOLOGY

Theoretical Framework

The research paper is based on the standard theory of growth, which was significantly extended by empirical testing to explain the economic growth by the increasing number of factors. However, to complete the picture, I find it necessary to present the theory, which explains the behavior of individuals who transfer their money abroad.

Thus, consider a model, presented by Fisher (1991), with the time differenced production function of the simplest form:

$$Y_t = F(A_t, a(\ )K_t, b(\ )H_t), \text{ where}$$

A_t is an efficiency factor, which in the empirical set up includes not only technology level, but also represent, for example, the quality of government in the economy or other institutional factors (Fisher, 1991). K_t and H_t represent physical and human capital respectively, $a(\ )$ and $b(\ )$ are its efficiency factors.

Differentiating equation yields:

$$GY = \alpha_1 A / \dot{A} + \alpha_2 (a / \dot{a} + K / \dot{K}) + \alpha_3 (b / \dot{b} + H / \dot{H}), \text{ where}$$

α_i are corresponding elasticities and GY is the growth rate of aggregate output.

Since the development of the theory, a vast amount of researches has been performed to estimate the economies growth. Fisher (1991) alone found over 40 different cross-sectional growth studies, where well over 50 different regressors

were used to explain the growth of the economy, such as variables related to trade and trade policy, exchange rates; fiscal policy; political and social stability and rights; human capital; and macroeconomic policy and outcomes (Fisher, 1991). Thus, the model specification used in this paper is based on the previous research in the field and some specific papers, concerning the capital flight issue.

Much less can be said on theoretical framework underlying the individuals' decision to illegally transfer the capital abroad. We know that people engage in this activity to: "avoid government taxation, wealth expropriation, or unfavorable developments; to search for a better treatment of and investment returns to capital; or some other reasons" (Beja, 2007). However, the models presented in the literature on the capital flight usually have small if any account for the desire to perform capital transfers illegally. For the purpose of exposition, we will discuss the most well-known model.

There are basically three types of models in the capital flight's literature: risk expropriation models, political economy models and public finance models (Collier, 1999). However, only the first class of models has an empirical implication. The most well-known model was developed by Kouri (1978) and Dornbush (1988). It tries to distinguish between the regular portfolio diversification incentives and relative risk incentives. The main goal is to show, that except of the regular portfolio diversification, agents have incentives to transform the capital abroad, which can be caused by macroeconomic instability and other factors. On the basis of this model, Sheets (1995) suggests few possible channels of capital flight. First, macroeconomic and political instabilities may increase the variance of the domestic asset, which in turn increases the last term in the equation and leads to the fall in demand for domestic asset. Second, even though the expected return on the assets is high in transition countries, financial

sector inefficiencies, heavy tax burdens and loose monetary policy can decrease the rate of return on the domestic capital and result in the decrease in the demand for the domestic asset. This, in turn, results in the illegal capital outflow, which is aimed at avoiding this heavy tax burden and arises as a result of a loose monetary policy.

The Econometric Model

As we have stated above, in order to investigate the effect of the capital flight on the economy growth we will use the model based on the Hadjimichael (1994) model. In particular, the equation describing the model is:

$$Y_{it} = \alpha_{it} + \beta X_{i(t-1)} + \gamma CF_{i(t-1)} + \varepsilon_{it},$$

Where dependent variable Y_{it} is the per capita growth of the GDP, $X_{i(t-1)}$ represent the set of control variables taken with the lag and $CF_{i(t-1)}$ is the proxy for capital flight. The capital flight variable enters the model with the lag for two reasons. First, is that intuitively, the money which flee out of the economy this year will affect the economic growth in the next period. Second reason is that the lag of the capital flight helps us to avoid endogeneity problem between growth of GDP and capital flight in our empirical analysis. The main hypothesis is to test that γ has a negative significant value. If this is true, then we will be able to measure the effect of capital flight on the economic growth. Control variables include lagged value of the capital formation as a ratio of GDP, growth in the consumer price index (rate of inflation), growth in terms of trade and rate of population growth. We will proceed with the discussion on variables consideration in the next subchapter.

For our panel data pooled OLS, fixed and random effect estimation techniques will be used. However, there are few important econometric issues which need to be addressed. First, having several proxies of macroeconomic stability may result

in the multicollinearity in the explanatory variables. However, this issue can be tackled by computing the correlation between the corresponding variables. If the correlation is large, it means that these explanatory variables contain similar information and should not be both included in the regression.

Another more important problem is the possible problem of endogeneity between the capital flight and growth, as we can not state for sure which variable determines which. From the point of view, presented in the paper, capital flight deteriorates the economy growth through the number of channels. In contrast, other studies performed to estimate the magnitude of the capital flight have used the growth of GDP as their explanatory variable (Schineller, 1997). As has been stated above, in order to cope with this problem we use the lag of capital flight, as there is little chance that a GDP growth this year has an influence on the capital flight last year.

At last, as we have previously discussed, different specifications of the growth model tend to have a whole range of different explanatory variables. As we have included only a few, our model may incur the problem of omitted variables. Our choice of the variables was mainly based on the paper of Sala-i-Martin, who has found a range of variables strongly related to growth (Sala-i-Martin, 1997).

Variable Consideration

In this subchapter we would like to explain the motivation of including the explanatory variables in our model's specification. However, we will first start with our dependant variable:

Capital Flight

The Global Financial Integrity Fund performed and estimation of the three different measurements of the capital flight for the period of 2002-2006 for all

the developing countries in the world (see Kar, 2008). In this research we have used their data to proxy the capital flight for 139 countries developing countries (See Appendix A). Kar estimated the capital flight using Hot Money Method, World Bank Residual Method and Trade Mispricing Model. Then, six different combinations of economic models were tested and the one that provides the most comprehensive and reliable estimate according to Kar's opinion was selected for our research. In particular, it consisted of combination of a World Bank Residual Model, estimated using change in external debt and a Trade Mispricing model, estimated using gross excluding reversals method (see Kar, 2008). To come up with such combination the author first excluded the Hot Money Method, due to data limitations on it. Then, he has chosen between two methods of computing World Bank Proxy: the change in external debt (CED) and net flow of debt (NDF) as a source of financial resources. The CED method was chosen, as it perceived to have fewer gaps in the data and more up-to-date information in comparison with NDF method. The second counterpart of our capital flight proxy was the Trade Mispricing proxy, estimated using gross excluding reversals method. The initial version of trade mispricing model was estimated with net method, which gave a credit to many developing countries for the return of capital, while in fact those countries did not implement any economic reforms to get this capital back. Thus, such netting policy was reducing the real amount of capital flight and researches started to use the trade mispricing proxy excluding the capital inflows (gross excluding reversal method). Hence, the following combination was chosen as a measure of capital flight for our research:

$$Capital\ Flight = World\ Bank\ (CED) + Trade\ Mispricing\ (GER)$$

We further provide the formulas to proxy capital flight by these methods:

World Bank: Residual Method. The unrecorded flows occur when the sources of funds exceed the recorded use of funds:

$$\begin{array}{cc} \leftarrow Source\ of\ \ funds\ \rightarrow & \leftarrow Use\ of\ \ funds \rightarrow \\ K = \left[\Delta External\ Debt + FDI(net)\right] & - \left[CA\ Deficit + \Delta \mathrm{Re} serves\right] \end{array}$$

Trade Mispricing Model. The data on world trade exports and imports is reported to the IMF by the Direction of Trade Statistics, which make it a feasible task to estimate the illegal flows by the estimation method, presented below:

$$K = \left[X_i\right] - M_j / \beta + \left[M_i / \beta\right] - X_j,$$

Where X and M capture the mispricing on export and import respectively, and β is the adjustment factor for the cost of insurance and freight. It can be the case that the bilateral trade yields an overstatement of exports or understatement of imports, which might result in the wrong sings. The authors followed the common practice in netting out such wrong sings and using the "gross excluding reversals" estimates.

Among control variables used in the model specification we have: lagged gross capital formation as a ratio of GDP, percentage change in the consumer price index (rate of inflation), percentage change in terms of trade and the rate of population growth.

Gross capital formation. This variable reflect the positive effect of physical capital on growth, predicted by the theory of growth. It is taken with lag to avoid endogeneity with the growth in GDP.

Initial level of GDP (log). Researches note, that this variable helps to capture initial state of the economy and control for some heterogeneity across countries (Demchuk, 2003). Taken into account that we have only developing countries in the sample, we would assume that richer countries overall will tend to have higher growth rates. We have used 2001 as the initial year to account for the level of GDP.

Rate of inflation. Using the change in consumer price index as the percentage change in the rate of inflation allow us to account for one of the important macroeconomic factors, which are believed to have an important negative influence on growth (Hadjimichael, 1994).

Percentage change in terms of trade. As Hadjimichael (1994) states: "an improvement in the terms of trade were to reduce input prices relative to output prices, firms would have an incentive to raise quantity supplied." Thus, we would expect it to have a positive influence for the next year on the growth of GDP. Thus, we take this variable with the lag.

Rate of population growth. By the theoretical notion of the growth model, population growth is believed to have a significant negative effect on the economy per capita growth, affecting the steady state.

Life Expectancy at 2001. Is another measure of human capital which has proven to have a positive effect on economic growth (Sala-i-Martin, 1997).

Index of Economic Freedom. Computed by the Heritage Foundation, this index is a composite of ten equally weighted specific economic freedoms, such as business freedom, trade freedom, fiscal freedom, government size, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption and labor freedom. Ranging from 0 to 100 this index has perceived to capture the most important components of economic growth.

Political Right Index. This index measures the degree of freedom in the electoral process, political pluralism and participation, as well functioning of government.

Computed by the World Resources Institute, this index measures political rights on the scale from 1 to 7, with 1 being the most free. This index has a negative correlation to an index of economic freedom of 37%, as many of the freedoms appear in the country simultaneously.

Thus, the expected signs of the regression coefficients, based on the model specification are summarized in the table below.

Table 1. Expected Signs of the Variables

Independent Variable	Expected Sign
Capital Flight	Negative
Gross Capital Formation	Positive
Initial Level of GDP	Positive
Initial Life Expectancy	Negative
Inflation Rate	Negative
Growth in Terms of Trade	Positive
Population Growth	Positive
Index of Economic Freedom	Positive
Political Rights Index	Negative

Estimation Techniques

1. *Pooled OLS*. Using this method we estimate:

$$GGDP_{it} = X_{it}\beta + (u_i + e_{it}),$$

where u_i is a country specific effect and e_{it} is an idiosyncratic error term.

OLS estimator will be unbiased and consistent only if $Corr(X'_{it}\varepsilon_{it}) = 0$, where $\varepsilon_{it} = u_i + e_{it}$ is the composite error. This assumes that both $Corr(X'_{it}e_{it}) = 0$ and $Corr(X'_{it}u_i) = 0$. However, we often want the country-specific effect to correlate

with our explanatory variables. This fact makes our last assumption very restrictive.

2. *Fixed effects estimation*. Using this method we estimate:

$$GGDP_{it} = \beta(X_{it} - \bar{X}_i) + (e_{it} - \bar{e}_i)$$

We use fixed effects estimation to avoid unobserved heterogeneity caused by country-level effects. It introduces dummy variables to allow for the country-specific but time-constant omitted variables. All variables in the model are expressed as deviations from their means.

3. *Random effects estimation*.

If our vector of explanatory variables does not vary much over time, fixed effect method can lead to not very efficient estimates. If the country-specific effect does not correlated with X_{it}, fixed effect estimator will be inefficient. In this case random effects can be used to the estimate the model. The estimator will be unbiased and consistent for fixed T and $N \to \infty$. However, if $Cov(X_{it,} u_i) \neq 0$, random effect estimator is inconsistent. We use Hausman test to choose between fixed effects and random effects estimation.

Chapter 4

DATA DESCRIPTION

This research is based on the cross-section and time-series data on the 139 countries in transition from Africa, Asia, Europe Middle East and North Africa (MENA) and Western Hemisphere. Even though the Western Hemisphere is a half of the world, only the 15% of total population live there. Table 1 in the Appendix A presents the set of the countries by the region. Most of the data was taken from the World Development Indicators CD. However, the proxy for the capital flight was created using the World Bank and Trade Mispricing Model estimates, performed by Global Financial Integrity program research (Kar, 2008). The time frame is limited by these estimates, which are presented for the 2002-2006 years. It should be noted, that the data collected by Dav Kar has been normalized by a two-stage filtration process. Under filtration the author understood procedure of nullification of such observations, which did not satisfy the filtration criteria. Hence, during the first stage countries survived the filtration had at least three out of five years of capital flight. On the second stage, countries survived had their capital flight exceeding 10 percent of their exports.

Descriptive statistics of the variables under consideration is presented in the Table 2 Appendix B. For each variable we have approximately 690 observations, which include 5 time periods (2002-2006 years) and 139 countries. The dependent variable is the growth of real GDP per capital, which averages 0.1271%.

Illicit capital flight variable is measured as a share of country's GDP. Descriptive statistics suggests that illicit capital outflows account on average for 10.60 percent of GDP.

Figure 1 and 2 in the Appendix C shows the total capital flight from the developing countries by the region for the 2002-2006 years. We see that half of the capital flee out of Asia. This does not come at surprise. Even after early nineties, when a lot of countries in Asia have attracted massive capital inflows called "Asian Miracle" it soon faced a massive capital outflows, both legal and illegal, turning the situation to "Asian Crises" (Shibuya, 2001).

Figure C3 shows dynamics of the ratio of capital flight to GDP over the regions. We see that MENA is the only region, for which the capital flight constantly increased over the 5-years period. Both, Africa and Asia had a downward trend in the Amount of capital flight since 2004. It is interesting to note that even though in absolute terms Asia accounts for the half of all illicit outflows, in terms of ratio of Capital flight to GDP it gives the leading place to MENA region since 2005. Looking at Figure C4 in the Appendix C, which presents the dynamics of GDP per capita growth, we see, that Asia exhibits the most evident link between capital flight and GDP per capita growth. For example, increase in the capital flight in 2002 and 2003 followed by a decrease in GDP growth in 2003 and 2004, while decrease in the capital flight in 2004 was followed by and increase in GDP growth in 2005.

It is also interesting to note, that index of economic freedom averages 58.30 out of 100, which is quite high for the developing countries. Africa has the lowest average level of freedom with Nigeria having the absolute minimum and the

countries from Western Hemisphere have the highest average economic freedom (See Table B.3, Appendix B).

Population growth, which has perceived to have a negative influence on economic growth, averages 1.4 percent. An interesting fact is that mostly European countries, such as Armenia, Georgia, Lithuania and Russia exhibit negative population growth for the whole time span.

Chapter 5

ESTIMATION RESULTS

Even though the growth regressions are very likely to have country- or region-specific effects, we will start the estimation from the OLS procedure. The coefficients for the POLS regression have the expected sign. However, we know that the POLS is very restrictive. Choosing between POLS and fixed effect procedure, discussed in the Chapter 3, we analyzed the statistics from the F-test for common intercept, which favored the fixed effect estimation. Proceeding with the random effect estimation we performed a Hausman test, where we could not accept the null that the difference in coefficients is non-systematic. Thus, the fixed effect estimation should be applied for the analysis.

To check whether our data exhibits serial correlation, as we suspected earlier, we performed Wooldridge test for serial autocorrelation. However, we could not reject the H_0 of no serial correlation. To tackle another possible problem of heteroskedsticity, we have performed Breusch-Pagan / Cook-Weisberg test for heteroskedasticity. As we could not reject the null hypothesis of constant variance, we conclude that the data does not exhibit heteroskedastic error terms.

The main results are presented in Table 2. As we have noted earlier, all explanatory variables are taken with the lag to show, how these variables, formed last year, influence the economics growth in the current year. As was noted above, we discuss the results, obtained with the fixed effect model.

Table 2. Main Estimation Results

Explanatory Variables (taken with the lag)	**POLS**	**Fixed Effect***	**Random Effect**
	Dependant variable:	Dependant variable:	Dependant variable:
	Growth in GDP	Growth in GDP	Growth in GDP
Capital Flight	0.024	-0.14**	-0.028
	(.067)	(.073)	(0.067)
Capital Formation	0.003***	0.007***	0.004***
	(.0008)	(0.002)	(.001)
Terms of Trade Growth	0.135***	0.087	0.120***
	(0.045)	(0.0.420)	(0.040)
Initial Value of GDP	0.0001	-	-0.0001
(log)	(0.003)		(0.005)
Population Growth	-0.038***	-0.003	-0.032***
	(0.005)	(.032)	(0.007)
Inflation Rate	-0.001	0.004***	-0.0009***
	(0.0008)	(0.001)	(0.0002)
Initial Life Expectancy	0.0004	-	0.0006
	(0.0007)		(0.001)
Political Rights Index	0.009***	-0.009	0.008*
	(0.003)	(0.014)	(0.004)
Index of Economic	-0.002**	0.0007	-0.001
Freedom	(0.001)	(0.002)	(0.001)
Constant	0.1748**	-0.055	0.124
	(0.088)	(0.153)	(0.126)
R-sq	0.3256	0.1624	0.3134
F-Test		F(78, 223) = 3.78	
Hausman Test		χ^2 =40.82	
Robust standard errors in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

Looking first at the variable of interest we see that the capital flight does affect the economics growth negatively. The estimation results suggest that the change in Capital Flight to GDP by 1 percentage point affects the economic growth by -

0.14 percent. Comparing the magnitude of the Capital Flight variable, it should be noted that it is lower than in other studies, performed for one particular country. For example, Ajayi (2001) finds that for Kenya the magnitude of the coefficient is 0.551, which is also measured for 1 percent extra capital flight. At the same time, Beja in his study for Philippines found that capital flight reduced the economic growth of Philippines by the magnitude of 1 to 2.3 percent (Beja, 2007). However, it is hard to compare the studies in this field for three reasons: different countries, different time periods, different definitions of capital flight and measurement errors in computing proxies of capital flight. For example, Beja finds that four different research papers, which used the same proxy for capital flight for the same period for the same countries, found different capital flight estimates: while Vos and Yap estimated capital flight from the Philippines for 1975-1979 to be 2718 millions US dollars, Beja estimated it to be 4533 millions. All the difference accounted only for the different datasets used for the analysis (Beja, 2007).

Another explanatory variable, which influences economic growth, is capital formation. We see that in our model it is significant at 1 percent level. An increase in one percentage point of capital formation to GDP ratio will increase the per capita GDP growth by 0.007 percent.

As the initial value of GDP and initial life expectancy have the same values for each year, they drop out of the fixed effect estimation.

The population variable appears to have no significant effect in our model specification. However, some theorists predict, that this should be the case. For example, Working Group on Population Growth and Economic Development, citing Solow (1956) and Phels (1968) note, that "population growth, acting

through capital dilution, should have no further effect at all on the growth rate per capita output" (WGPG, 1986).

Inflation rate has a significant positive effect on GDP per capita growth. Even though traditionally we expect inflation to have negative impact on per capita GDP growth, empirical literature explains the fact of positive impact by two threshold levels, which the data exhibits. For example, Li Min notes: *"…for developing countries, the data suggest the presence of two thresholds in the function relating economic growth and inflation. When the rate of inflation is below the first threshold, the effects of inflation on the economic growth rate are insignificant or even positive…" (Min, 2006)*. She estimates the first level of threshold being 14% a year. In our case, the level of inflation is lower than the first threshold level.

Performing the fixed effect estimation for each region separately we see, that the capital flight has a significant influence only for Europe and the Western Hemisphere.

Table 3. Estimating the Capital Flight for Regions

Dependant variable: Growth in GDP per Capita	**Fixed Effect**
	Explanatory Variable: Capital Flight
Africa	-0.068
	(0.308)
Asia	-0.04
	(0.158)
Europe	**-0.298****
	(0.126)
MENA	-0.09
	(0.156)
Western Hemisphere	**-0.192***
	(0.113)

The possible explanation of the insignificant effect is a small number of observations for the regions.

Another way to see that the data exhibits country-individual effect and the fixed effect estimation procedure is the most appropriate is to control for regions (see Table D3, Appendix D). As there is more similarity of the countries in one region, the region dummies capture this country effect. Taken Asia as a control group, we see that Middle East and North Africa, as well as Europe have different intercept.

Controlling for year dummies in the specification we find, that the effect of capital flight is insignificant.

Table 4. Regression Results with Year Dummies

	Fixed Effect*
	Dependant variable:
	Growth in GDP
Capital Flight	**-0.07**
	(0.075)
Capital Formation	0.008***
	(0.002)
Political Rights Index	-0.006
	(0.013)
Index of Economic	0.0008
Freedom	(0.0023)
Terms of Trade Growth	0.082**
	(0.041)
Population Growth	-0.013
	(0.032)
Inflation Rate	0.004***
	(.001)
Year 2003	Dropped
Year 2004	-0.026**

	(0.013)
Year 2005	-0.038***
	(0.012)
Year 2006	0.006
	(0.0125)
Constant	-0.057
	(0.1498)
R-sq	0.2073

Thus, we see that the year dummies account for all the effect of capital flight. The year dummies control for the spuriocity of data: when the capital flight and growth in per capita GDP have the same upward or downward trends. Another reason for the insignificance of capital flight is the presence of measurement error. As we use proxy to estimate capital flight, there is a high possibility to have a measurement error, which will bias our results. At last, we could have not enough observations to capture this effect. As capital flight accounts on average for the 10 percent of GDP, its effect on the per capita GDP growth could be too small. The possible intuitive explanation for this finding is that the capital flight, which leaves the country illegally, tends to come back legally to its owners in the same or the next period to the country of origin, and there is no urgent need to control for these movements.

CONCLUSIONS AND POLICY IMPLICATIONS

In this research we analyze the impact of capital flight on the GDP growth in the developing countries and countries in transition. For this purpose, we used a recently computed data on estimates of capital flight, performed by the members of the Global Financial Integrity Project.

We found, that the capital flight does negatively affect the economic growth, however the significance of the estimate comes at a question. This impact has a country-individual origin, which motivated us to use fixed effect estimation procedure. However, after controlling for years, we find that the effect of capital flight is insignificant.

From the graphical analysis we found that even though in absolute terms the total capital flight for the period of 2002-2006 from Asia accounts for the half of all capital outflows, looking at the dynamic of Capital Flight to GDP ratio we see that MENA region has higher level of Capital Flight which was also constantly growing during the whole period under consideration. It is also important to note, that in the last year of analysis, Capital Flight to GDP ratio has also greatly increased for Europe and Western Hemisphere. It is also seen that Asia exhibits the most evident link between capital flight and GDP per capita growth. For example, increase in the capital flight in 2002 and 2003 followed by a decrease in GDP growth in 2003 and 2004, while decrease in the capital flight in 2004 was followed by and increase in GDP growth in 2005.

Of course there is no doubt in the society that the capital flight is a lost opportunity for the economy and, thus, is bad. However, the empirical analysis performed in the paper casts a doubt on the significance of this effect on GDP

per capita growth. Initially, we found negative significant effect of capital flight on the economic growth. However, after controlling for the years effect, the capital flight turned out to have no significant effect on GDP per capita growth.

There are three major reasons for the results obtained. First, as capital flight was measured as a proxy, the results could be biased because of the measurement error. As there is no definite measure of capital flight, measurement error is a common problem in the research in this field. Second, the amount of observations available could be not enough to obtain a significant result. At last, the effect of capital flight on the GDP per capita growth could be too small to be significant. Thus, the possible implication for further research is to construct the estimates for a longer time span.

It is stated in the European Network on Debt and Development Report on Capital Flight that: "…great opacity granted by the existing financial system makes it extremely difficult to assess the real dimensions of the problems (of capital flights) and to effectively resolve them" (Ruiz, 2008). Thus, assuming that we used a good underlying theory and that the same pattern will be observed by the economy in the future, we believe that the fact that our research showed no significant effect of capital flight on the economic growth could allow policy makers to dwell more on other problems of developing countries. At last, we can assume that the capital flight, which leaves the country illegally, tends to come back legally to its owners in the same or the next period to the origin, and there is no urgent need to control for these movements.

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APPENDIX A

Table A.1. Countries used for the analysis, by region

Africa	Asia	Europe	Middle East and North Africa	Western Hemisphere
Angola	Afghanistan	Albania	Algeria	Argentina
Benin	Bangladesh	Armenia	Algeria	Bahamas, The
Botswana	Brunei Darussalam	Azerbaijan	Bahrain	Barbados
Burkina Faso	Cambodia	Belarus	Egypt, Arab Rep.	Belize
Burundi	China	Bosnia and Herzegovina	Iran, Islamic Rep.	Bolivia
Cameroon	Fiji	Bulgaria	Israel	Brazil
Cape Verde	India	Croatia	Jordan	Chile
Central African Republic	Indonesia	Cyprus	Kuwait	Colombia
Comoros	Malaysia	Czech Republic	Lebanon	Costa Rica
Congo, Dem. Rep.	Maldives	Estonia	Libya	Dominica
Congo, Rep.	Mongolia	Georgia	Morocco	Dominican Republic
Djibouti	Nepal	Hungary	Oman	Ecuador
Equatorial Guinea	Pakistan	Kazakhstan	Qatar	El Salvador
Ethiopia	Papua New Guinea	Kyrgyz Republic	Saudi Arabia	Grenada
Gabon	Philippines	Latvia	Syrian Arab Republic	Guatemala
Gambia, The	Samoa	Lithuania	Tunisia	Guyana
Ghana	Solomon Islands	Macedonia, FYR	Yemen, Rep.	Haiti
Guinea	Sri Lanka	Malta		Honduras
Guinea-Bissau	Thailand	Moldova		Jamaica
Kenya	Tonga	Poland		Mexico
Lesotho	Vanuatu	Romania		Nicaragua
Liberia	Vietnam	Russian Federation		Panama
Madagascar		Slovak Republic		Paraguay
Malawi		Slovenia		Peru
Mali		Tajikistan		St. Kitts and Nevis
Mauritania		Turkey		St. Lucia
Mauritius		Ukraine		St. Vincent and the Grenadines
Mozambique				Suriname
Namibia				Trinidad and Tobago
Niger				Uruguay
Nigeria				Venezuela, RB
Rwanda				
Senegal				
Seychelles				
Sierra Leone				
South Africa				
Sudan				
Swaziland				
Tanzania				
Togo				
Uganda				
Zambia				
Zimbabwe				

APPENDIX B

Table B.2. Descriptive Statistics

Variable		Mean	Std.dev.	Min	Max	Observations
GDP Growth Per Capita	Overall	.1271	.1334	-.6643	1.1197	N =573
	Between		.0753	-.0479	.3450	n =97
	Within		.1107	-.5569	1.2947	T =5.907
Log of Initial GDP Level (2001)	Overall	23.5910	2.6310	17.6226	30.8285	N =616
	Between		2.6440	17.6226	30.8285	n =88
	Within		0	23.5910	23.5910	T =7
Capital Formation	Overall	22.9986	8.1182	6.11	63.23	N =635
	Between		7.2548	8.0886	47.045	n =95
	Within		3.9466	5.6758	42.6387	T =6.684
Capital Flight	Overall	.1060	.15712	0	1.6731	N =483
	Between		.1179	.00801	.8496	n =98
	Within		.1073	-.7177	.9296	T =4.929
Population Growth	Overall	1.4132	1.1308	-1.88	4.73	N =690
	Between		1.0964	-1.23	3.6757	n =99
	Within		.2925	-.4425	4.0675	T =6.970
Inflation	Overall	9.7067	25.0210	-13.92	381.27	N =676
	Between		24.5624	.445	239.366	n =99
	Within		13.0507	-153.0893	151.6106	T =6.828
Terms of Trade Growth	Overall	.0074	.1211	-.4224	.9156203	N =549
	Between		.0562	-.14302	.2406	n =96
	Within		.1090	-.4400	.8588	T =5.719
Life Expectancy (Years)	Overall	64.868	10.618	19.109	78.82	N =686
	Between		10.618	19.109	78.82	n =98
	Within		0	64.868	64.868	T=7
Index of Economic Freedom	Overall	58.283	8.6515	8.9	80.1	N =576
	Between		7.6926	35.3286	77.0429	n =87
	Within		4.4106	22.7255	75.4112	T= 6.621
Political Rights Index	Overall	3.6873	1.9605	1	7	N =582
	Between		1.9331	1	7	n =97
	Within		.3726	1.8540	5.5206	T=6

Table B.3. Index of Economic Freedom by Region

Region/Hemisphere		Mean	Std.dev.	Min	Max	Observations
Africa	Overall	54.10	8.39	8.90	69.90	N =153
	Between		7.33	35.33	68.24	n =24
	Within		4.35	18.54	65.24	T =6.375
Asia	Overall	55.94	6.15	35.90	75.50	N =69
	Between		4.39	49.77	63.10	n =12
	Within		4.57	42.06	73.06	T =5.75
Europe	Overall	58.45	8.45	33.50	80.10	N =154
	Between		7.66	43.00	72.40	n =22
	Within		3.88	39.39	67.57	T =7
MENA	Overall	59.73	8.54	36.30	76.30	N =70
	Between		7.82	42.94	73.84	n =10
	Within		4.13	48.76	73.33	T =7
Western Hemisphere	Overall	63.48	7.42	44.60	78	N =130
	Between		6.42	49.79	77.04	n =19
	Within		3.84	45.96	74.42	T =6.84

APPENDIX C

Figure C.1. Total Illicit Outflows from Developing Countries by Region, 2002-2006

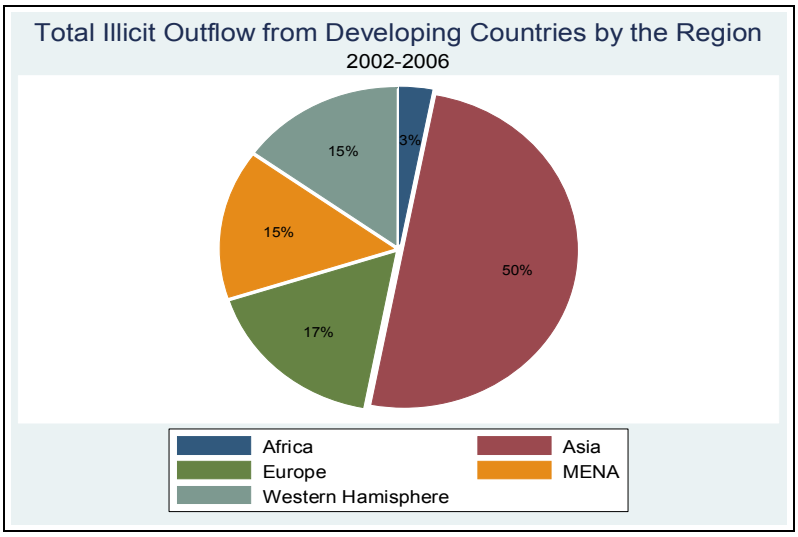


Figure C.2. Distribution of Illicit Financial Flows

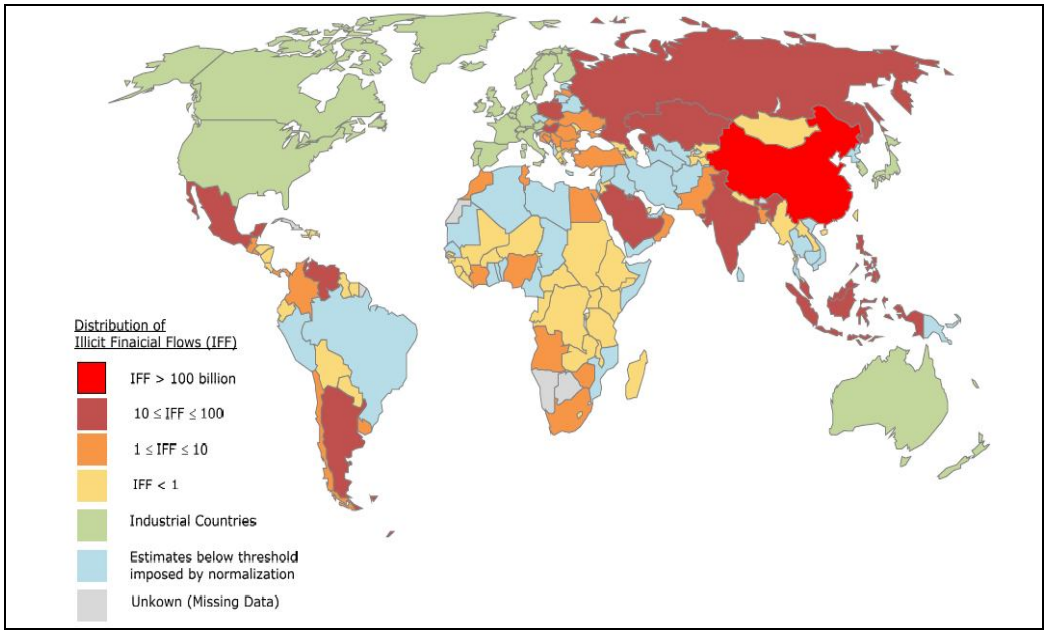


Figure C.3. Dynamics of Capital Flight/GDP Ratio by the region, 2002-2006

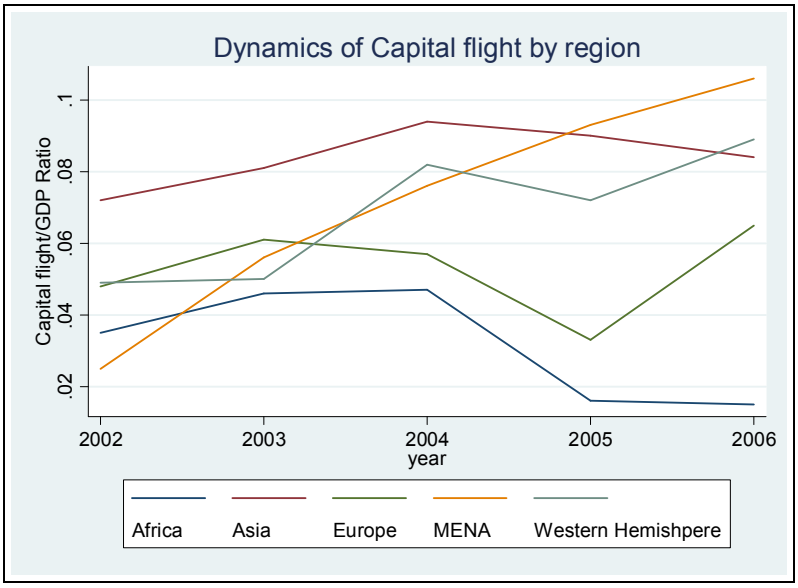
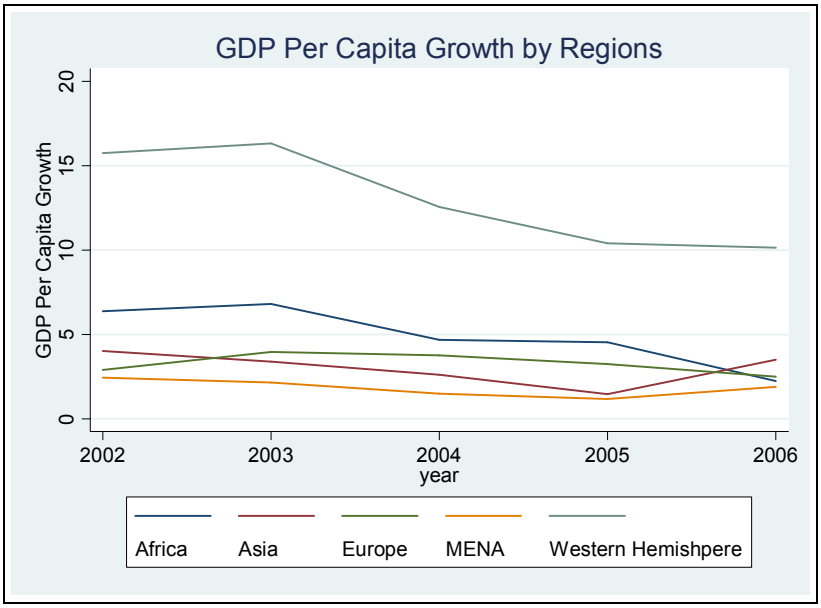


Figure C.4. Dynamics of GDP Per Capita Growth by the Region, 2002-2006



APPENDIX D

Table D3. Regression Results with Dummies for Asia, Europe, MENA and Western Hemisphere.

	POLS
	Dependant variable:
	Growth in GDP per Capita
Capital Flight	**-0.04**
	(0.004)
Capital Formation	0.004***
	(0.001)
Terms of Trade Growth	0.139***
	(0.04)
Population Growth	-0.002
	(0.008)
Inflation Rate	-0.0009***
	(0.0002)
Life Expectancy	-0.0008
	(0.0012)
Political Rights Index	0.0132***
	(0.0012)
Index of Economic	-0.00005
Freedom	(0.0008)
Africa	-0.131***
	(0.032)
Asia	-0.116***
	(0.023)
MENA	-0.148***
	(0.024)
Western Hemisphere	-0.101***
	(0.020)
Constant	0.032
	(0.120)
R-sq	0.4146
Robust standard errors in parentheses	