Foreign Direct Investment, Domestic Savings and Economic Growth: The Case of Russian Federation

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the Degree of

Master
of
Business Administration

Eastern Mediterranean University
June, 2013
Gazimağusa, North Cyprus

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ABSTRACT

The paper empirically investigates the relationship between real income, domestic savings and foreign direct investment in the case of Russian Federation using quarterly data covering the period 1989-2011. The correlations between variables are statistically proven by applying multiple regression analysis and the Johansen co-integration test reveals that there exist a long-run relationship between real income and domestic savings. Granger causality tests confirm that real income in Russia is FDI driven. Hence, real income is affected by foreign investment and domestic savings, one of the recommendations would be to ease the procedures of doing business in Russian Federation in order to attract foreign investors and develop investment climate in the country.

Keywords: Foreign Direct Investment, Gross Domestic Product, Domestic Savings, Johansen co-integration, Granger-Causality, Russia

ÖZ

Bu çalışma reel gelir, yerel tasarruflar ve yabancı doğrudan yatıramlar arasındaki ilişkiyi 1989-2011 arasındaki periyod içerisinde Rusya Federasyonu için emprik olarak incelemektedir. Değişkenler arasındaki ilişki istatistiksel olarak çoklu regresyon analizi kullanılarak kanıtlanmıştır.. Uzun dönem denge ilişkisi Johansen ko-entegrasyon testi ile incelenmiştir. Bu sonuçlara göre reel gelir ve yurtiçi tasarruflar arasındaki ilişki yabancı doğrudan yatırımlardan daha yüksek bulunmuştur Granger nedensellik testi sonucunda doğrudan yabancı yatırımların reel gelirdeki artışın nedenlerinden biri olduğu ortaya çıkmıştır çünkü reel gelir, yabancı yatırımlar ve yurtiçi tasarruflardan etkilenir. Bunların doğrultusunda ülkedeki yatırım ortamının geliştirilmesi ve yabancı yatırımcı çekmek amacıyla Rusya'da iş yapma prosedürleri kolaylaştırmak olacaktır.

Anahtar Kelimeler: Doğrudan Yabancı Yatırım Gayri Safi Yurtiçi Hasıla, , Yurtiçi Tasarruf, Johansen co-integration, Granger-Causality, Rusya

Dedicated To My Father

Abdusalom Rajabov

May His Soul Rest in Peace

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey – Fuller
DS	Domestic Savings
ECT	Error Correction Term
EEU	Eurasian Economic Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
LDS	Logarithm of Domestic Savings
LFDI	Logarithm of Foreign Direct Investment
LGDP	Logarithm of Gross Domestic Product
MNE	Multinational Enterprises
OECD	Organization for Economic Co-operation and Development
PP	Phillips – Perron
VAR model	Vector Auto Regressive model
VEC model	Vector Error Correction model
WTO	World Trade Organization

Chapter 1

INTRODUCTION

In our contemporary world with its increasing level of economic integration and globalization, knowing the impacts of foreign direct investment (FDI) on economic growth is crucial. The best example of rapidly growing trends in FDI is obsereved in developed countries. Nowadays developing countries realized the importance of FDI on economic development and trying to attract more FDI into their countries. In the literature many studies are directed to the possible linkages between economic growth and FDI. Studies made regarding this issue analyze this relationship from different points of view.

In theory, it is shown that FDI leads to economic growth via technology dispersion (Schneider, 2005; Dimelis, 2005), achievement of latest processes, know-how and managerial skills into the recipient nation states (Li and Liu, 2005; Girma, 2005). Researches made by Helpman and Grossman (1991), Hermes and Lensink (2003), Barro and Sala-i-Martin (1995) propose that FDI helps developing countries to upgrade their economies and facilitate economic growth. Romer (1993) argues that there is a big gap between rich and poor countries and that poorer countries may benefit from foreign investment in the form of transfer of technological and business know-how. Balasubramanyam, Salisu, and Sapsford (1996) stated that FDI consists of combination of technology, know how and capital stock, and can improve the available human capital through skill acquirement, labor training and the provision

of many management operations options and organizational compositions. Thus, foreign investment increases the productivity not only of those companies that receives foreign capital but all companies as a whole (Rappaport, 2000). Hermes and Lensink (2003) stated that FDI contributes to economic growth. Battena and Vo (2009) argue that countries with openness to international trade, developed stock market and decreasing population rate have solid impact of FDI on economic growth. From the macroeconomic perspectives generally positive impact on real income is observed as it was stated by De Gregorio (1992). Moreover, FDI builds international network which helps the domestic products to freely move across borders, helps corporations to save costs and create economies of scope (Battena and Vo 2009). The main factors behind boost of FDI in developing countries are privatization processes which give chance to foreign firms to acquire domestic firms, the globalization of production, and growth of financial and economic integration [UNCTAD, 1996]

Also, in the literature many researchers investigated the relationship between economic growth and domestic savings (DS). Bairamli and Kostoglou (2010) suggest that domestic savings accelerate and encourage economic development, since private savings increase domestic savings. Alguacil, Cuadros and Orts (2004) accepted the Solow's (1956) type growth model in the case of Mexico, which states that economic growth is caused by the higher level of domestic savings, as long as it promotes investments. In addition, investments and growth are encouraged by an increase in savings, and then economic growth gives further increase in savings. Thus, as savings rise, economic growth continues to go up, until savings and investment reach their equilibrium point (Odhiambo, 2009). For the country's investment the significance of domestic savings is not less important than

international flows of capital (Ozcan, Gunay and Ertac, 2003). The mobilization of domestic savings and investments plays an essential role in the enlargement of economy's production of goods and services (Bairamli and Kostoglou, 2010). In contrast, Edwards (1995) argues that in an open economy, the mobilization of capital makes savings and investment independent, such that if domestic savings are done in one country, they may be invested in another country. As a result, the country which saves may not experience growth because of the outflow of capital.

Considering that Russia has been through major restructuring and experiencing a transitional phase, these difficulties did not stop Russia to develop at a fast speed. Thus, the purpose of this thesis is to study the development of Russia's economy, mainly to observe the link between FDI, Domestic Savings and Economic Growth, and see how strong is the causality of these variables in the case of the biggest country in the world.

Including Introduction the formation of the thesis is as follows: Chapter 2 presents the Literature Review regarding the researched topic. General information on Economy of Russia is given in Chapter 3. Chapter 4 provides Data and Methodology. Empirical Results discussed in Chapter 5, and the study ends with Conclusion and Policy Implications in Chapter 6.

Chapter 2

LITERATURE REVIEW

2.1 Economic Growth and Foreign Direct Investment

In the literature, the relationship between FDI and economic growth is widely studied. The FDI's impact on a country's economy and factors that directly affect FDI can be broadly discussed, but researchers are mainly concentrated on the FDI's effects on growth, and such factors like human capital, technology, financial system and international trade. From the macroeconomic perspectives generally FDI's positive impact on real income is observed as it was stated by De Gregorio (1992). For example, Borensztein, De Gregorio, and Lee (1998) believe that country has a positive growth effect and is able to utilize FDI spillovers only with its highly educated workforce. Borensztein (1998) proposed that mainly the ability to adapt to international technology is accelerated by human capital. Therefore, the positive effect of FDI on economic growth may be obtained through large contribution for the improvement of human capital. Borensztein (1998) suggests that any country can improve its FDI even with a low percentage of human capital. Relatively, for the host country to benefit from FDI inflows, they require markets to be liberalized, stability in economy and human capital (Bengoa and Sanchez-Robles, 2003). However, there is were no evidence of education's role in absorbing the new technology, Blomstrom, Lipsey, and Zejan (1994) believe that when the country is rich, FDI has a positive impact on growth.

Luiz (1997) stated that the attractiveness of a country to FDI and the willingness of foreign firms to introduce the host country with modern technology, depend on country's factor endowments and its specific trade and policy mode. Therefore, the degree of switching from capital stock of old (domestic) to new (FDI driven) technology is observed more in technologically advanced countries. The FDI's positive effect on economic growth can directly occur by providing jobs and capital and indirectly by flow of technology. However, at the same time FDI can outcompete domestic firms, heighten industry concentration, and not transfer new technologies to the domestic firms, because foreign investors' main interest is its own earnings not the developments in the host country. In these circumstances, FDI should be encouraged only when FDI facilitates growth (Reiter and Kevin Steensma, 2010).

Li and Liu (2005) argue that endogeneity is another problematic issue for evaluating the FDI's effects on growth. GDP and FDI can be highly interrelated such that FDI may lead the market size to grow which in turn may attract more FDI to the country. This endogeneity should be further studied, but many of the researches just ignore it. Li and Liu (2005) in their study used the period from 1970 to 1999 and they found that only after 80's endogenous relationship of FDI and growth was notably increased and become complementary to each other in either developed or developing countries.

Another controversial study shows us very interesting results. A bilateral connection in open economies between FDI and economic growth is found (Basu, Chakraborty, and Reagle, 2003), whilst, in closed economies the relation was bilateral in the short term, but in the long term it turned to be from growth to FDI. The relative empirical study was done by Jai Mah (2010) in case of China, which suggested that economic

growth was not caused by FDI but conversely economic growth of China caused FDI inflows to rise. Thus, for the Chinese government there is no need to grant with financial subsidies and tax incentives to foreign firms to attract them to the country. Because of rapid economic growth of China, FDI is going to be increasing even without providing incentives.

On the other hand, many countries started to pay attention to their financial system believing that flow of FDI mainly depends on it. Thus, influenced by this thought governments begin to focus on renovation of financial markets. For example, "FDI facilitates the economic growth" argument is supported by Hermes and Lensink (2003). In their study they found that most of the Latin American and Asian countries with developed financial systems have more chances to attract FDI in order to increase real income. Whereas sub-Saharan ones showed a very weak financial system, hence FDI was negatively correlated with economic growth. Researchers state that countries with developed financial markets decrease the cost of transactions and make sure to choose efficient projects with considerable high returns, which will lead to economic expansion. While, Alfaro, Chanda, Kalemli-Ozcan and Sayek (2006) propose that FDI causes economic growth through developed financial markets which helps countries to have positive spillover effects on the whole economy and to maintain the growth, policy makers should realize the importance of local conditions. It was found that FDI contributes to economic growth when domestic firms' products are substitutes to those of multinational enterprises (MNE) rather than complements. Finally, they believe that developed human capacity plays an essential role for the economic growth though FDI, as long as MNEs are prone to use highly educated labor force.

Additionally, McKinnon (1973) argues that there is a necessity for the countries to develop capital markets in order to nurture the adoption of technologies and increase the rate of learning by doing, because bounded access to credit markets can be an obstacle for the entrepreneurial development. Alternatively, the other study found that countries with developed financial markets experience economic growth resulted from FDI (Alfaro, Chanda, Kalemli-Ozcan, and Sayek, 2000). Meanwhile, the research made by Balasubramanyam, Dapsoford and Salisu (1996), emphasize that to achieve growth effects of FDI, the trade openness is essential. Respectively, Katircioglu (2009) studied the possible relationship of international trade and financial progress on economic growth. The study was done in case of India in the period between 1965-2004 and he found that international trade and financial enhancement have long-run relationship with economic development. Comparatively, almost the same result in case of Cyprus was found by Katircioglu (2009). Long-run relationship between international tourism and international trade on economic growth is observed. Balasubramanyam (1996) found out that for export promoting rather than import substituting countries, FDI plays more crucial role in economic growth. Respectively, FDI changes from country to country and it highly depends on the trade policies of a country. Thereby, Carkovic and Levine (2002) suggest that control over inflation and government size may lead FDI to positively effect the growth while restrictions on trade openness, black market premium and limited financial development may cause FDI to have restricted impact on it.

Castiglione, Gorbunova, Infante, Smirnova (2012) state that despite the optimism related to FDI, due to the liberalization and privatization during the transition period, FDI was considerably unstable, and regarding the Russian regions, FDI was not homogeneous because of regional characteristics. Moreover, they studied three

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factors of FDI inflows that affect Russian regions. Generally the factor that explains attractiveness by FDI is high level of income and large population, but it is contrary in the case of Russia. In most countries FDI is usually attracted by the coastal areas as long as it is cheaper regarding the transportation costs, however, FDI is mostly directed to Moscow which is not feasible for investment, because it is not located in the coastal area in the case of Russia. The second factor is social, physical and human capital like private investments, education and infrastructure. Regions with high level of domestic investments also attract FDI, and developed infrastructure highly positively influences the incoming FDI. Whereas, education level was not important for the FDI, though education level in Russian regions is significantly high. The last factor is social stability and regional risk on which foreign investors pay high attention when making the location decision. Russia is still regarded as a problematic country. However, in case of Russia the regional risk showed not to be important for investors either, it may be because of lack of information that foreign firms get regarding Moscow's political control over regions. Nevertheless, regions with natural resources are notably attracting the resource seeking FDI in Russia.

On the other hand, Ogutcu (2012) sees a positive trend in the flow of FDI in Russia, because of Russia's huge territory, natural resources, technology, skilled workforce and large population. Thus, there is continuous growth of foreign investors recorded after the 1998 financial crisis. In addition, positive changes were made in favor of foreign investors under the Putin's presidency, who made extensive reforms in the political system after Yeltsin's leadership.

2.2 Domestic Savings and Economic Growth

The study on Africa during 1950 and 2005, proves the existence of short-run bidirectional relationship among domestic savings and growth, however economic growth causes an increase in domestic savings in long-run period. Thus, South Africa is recommended to focus more on increasing the short run growth and savings in order to attract more foreign investments, and in the long run they should promote economic growth to increase savings and foreign investment (Nicholas Odhiambo 2009). On the contrary, Alguacil, Cuadros and Orts (2004) stated that despite of many beliefs that economic growth cause domestic savings to increase, in the case of Mexico in the period 1970-2000, the contrary was found that domestic savings caused economic growth to rise. For example, in the case of Azerbaijan, Bairamli and Kostoglou (2010) stated that domestic savings are very important factor for economic growth, and developed financial system is required in order to channel domestic savings into proper investments. As long as private savings are the crucial element of domestic savings, policy makers should concentrate on increasing the level of private investments. In Azerbaijan most of the foreign capital is used for the production of oil and gas. Thus, private savings could be directed only for the development of non-oil sectors. Moreover, savings of people results in capital accumulation which leads to economic growth. With high levels of domestic savings, the country can overcome the unemployment problem and can attract entrepreneurs to the economy which will contribute to growth. Like Azerbaijan, the empirical results of Tang, Selvanathan and Selvanathan (2008) on China show that rather than displacing domestic investments, FDI has a complementary relationship to the domestic investment.

Guariglia and Kim (2004) made a research on the precautionary saving in the case of Russia. They found out that "earnings uncertainty" positively effects saving, yet the effect is weakened if the households have multiple jobs and other way round if head of family holds multiple jobs. If in a family members have multiple jobs, then they share the risk, thus precautionary saving is reduced. However, if family head is only holding multiple jobs, then the extra job is used to insure the family protection; therefore they decrease their precautionary savings. Foley and Pyle (2005) argue that savings for Russia are important in two ways. First, household savings results in economic growth. Second, the development of Russia may lead to increase in household savings. Russia can achieve both of these important factors if the financial sector improves and stays stable, market supporting institutions develop, the social insurance system becomes more complete and inclusive. On the other hand, one obstacle is that Russia is now divided into "two Russias", one consists of major property owners who are called oligarchs. They are usually the owners of the banks, enterprises or financial magnates; the second Russia consists of the majority of the population half of which are below the poverty level. Therefore, the savings of this "two Russias" differ significantly. One has none, and the other holds three – fourths of total savings (Rimashevskaya, 1999).

2.3 Foreign Direct Investment and Domestic Savings

Empirical studies show that in South Africa FDI and domestic savings influence each other at least in the short run (Odhiambo, 2009). In case of Bangladesh Salahuddin, Shahbaz and Chani (2010) used period between 1985-2007, and they found both long run and the short run correlation between FDI and domestic savings and suggest that FDI and domestic savings are complements. To attract foreign investment, policy makers should improve its infrastructure, decrease the level of political instability

and corruption, and improve the law and order in the country. The same result was found in the case of Mexico for the period between 1970 and 2000. It was concluded that bidirectional relationship exists between FDI and domestic savings, and growth was considerably influenced by both FDI and domestic savings (Alguacil, Cuadros and Orts, 2004).

Chapter 3

THE ECONOMY OF RUSSIA

3.1 The Russian Federation

Russia is officially known as the Russian Federation located in Northern Eurasia with population over 142,500,482 (CIA-The World Factbook, 2012). Russia is the biggest country in the world. Russia's neighbors are Norway, Finland, Estonia, Latvia, Lithuania, Poland, Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, China, Mongolia, and North Korea. Russia has been going through major changes since the collapse of the Soviet Union in 1991. The main change was to transfer from a planned economy to open market economy with global integration. In 1990 most of the industries have been privatized except defense related industries and energy sectors.

The economy of Russia mainly depends on oil and gas production. In 2011 Russia was ahead of Saudi Arabia in oil production. In the world Russia has the biggest natural gas reserves, and the second biggest coal reserves, and Russia is the second largest producer of natural gas. Moreover, Russia is the one of the biggest exporter of aluminum and steel. In 2012 Russia joined the World Trade Organization (WTO) which will contribute to its transition to a market economy by reducing the trade barriers for the foreign goods and services. Russia also established Eurasian Economic Union (EEU) through which it built cement economic ties with Kazakhstan and Belarus. GDP of Russia is $2.509 trillion (2012 est.), GDP per capita

is $17,700 (2012 est.), and GDP real growth rate is 3.6% (2012 est.). Exports are $542.5 billion (2012 est.) and export products are natural gas, chemicals, petroleum products, wood products, metals, and military and civilian manufactures. Russia's imports are $358.1 billion (2012 est.) and imported products are vehicles, plastic, machinery, iron, semi-finished metal products, optical and medical instruments, pharmaceutical products, meat, fruits and nuts. Public debt of Russia is 11% of GDP (CIA-The World Factbook, 2012).

3.2 Economic Outlook of Russia

The economy of Russia has gone through the biggest stress while moving from a centrally planned economy to free market economy after 1991. After the collapse of the Soviet Union, Russian economy became very volatile. The first biggest hit to the economy was Russian financial crisis in 1998 which resulted in the negative economic growth and rapid reduction in foreign investment, drop in the value of ruble, breakdown in the banking system and decrease in the export prices of Russia. However, this was not the first and last crisis experienced by Russia. Other recessions followed up and Sahin (2009) believes that reasons behind those crises were high public debt, difficulties in balance of payments, high inflation and interest rates, current account deficit, trade deficit and weak financial system.
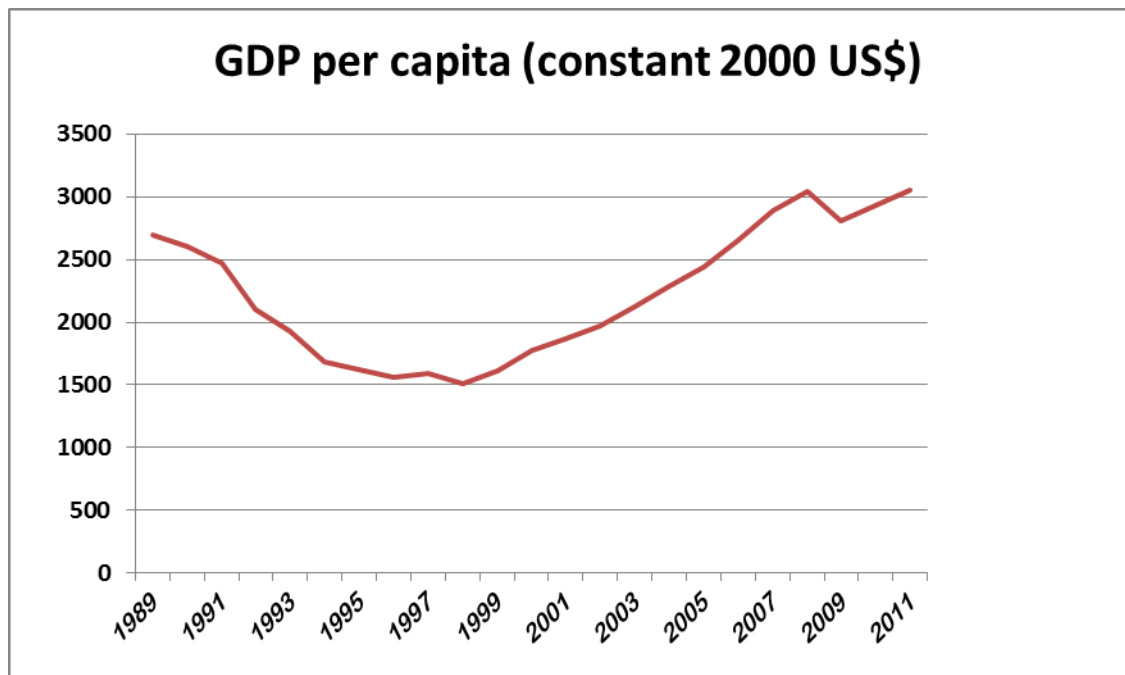
Figure 3.1: GDP per Capita (USD) 1989-2011
  Source: *World Bank (2013)*

It is obvious from the Figure 3.1 that before the 90's per capita income of Russia was high enough. However, Boris Yeltsin came to the presidency right after the collapse of the Soviet Union and begins economic restructuring which resulted in hyperinflation, increased bureaucracy and corruption of government officials. From that time GDP of Russia in the economy started falling and in 1998 due to Russian financial crisis GDP per capita was at its minimum score of 1500$.

From 1999 to 2008 Vladimir Putin was the president of the Russian Federation. And we see how the growth was considerable during his governance, per capita income doubled from 1500$ to 3000$ in constant 2000 US dollars. During Putin's presidency investments increased tremendously, the average salary was raised from 80$ to 640$ a month, there was also growth in construction and agriculture sectors, and the number of people in the middle class increased from 8 million to 55 million (World Bank, 2013).

However in 2008, Russia was affected by the global economic crisis. During the crisis the price of oil descended and because Russia's main export is oil, foreign credits on which Russian banks relied upon were no more prevailed. Thus, in 2008 GDP declined from 3000$ to 2800$ (CIA, The World Factbook, 2013).

In the third quarter of 2009 the economy of Russia began to grow again. Increase in oil prices in 2011-2012 helped Russia to recover from the budget deficit resulted from the 2008 crisis. Because of dynamic economic growth Russia could reduce unemployment and inflation rates. In 2012 Russia joined the WTO guaranteeing its products to have access to foreign markets, and with high consumption rate, domestic market of Russia could be a potential target for Russian manufacturers (CIA, The World Factbook, 2013).

In 2012 the economic growth of Russia was faster than Brazil, Turkey and South Korea, which was not expected two years ago. In 2012 because of huge surplus in the trade balance, the current account was stable. Capital outflows decreased which gave chance to the Central Bank of Russia to increase its reserves. Public debt of Russia declined to 10% of GDP while in other advanced economies it was recorded to be 110% of GDP or even more, wages increased at a solid rate and the number of poor people dropped to 16.4 million which is two million less than a year ago. As figure 3.2 shows that Russia reached the 8th position as the largest economy in the world from 18th between 2000 and 2008, in 2012 it remained in the same position.
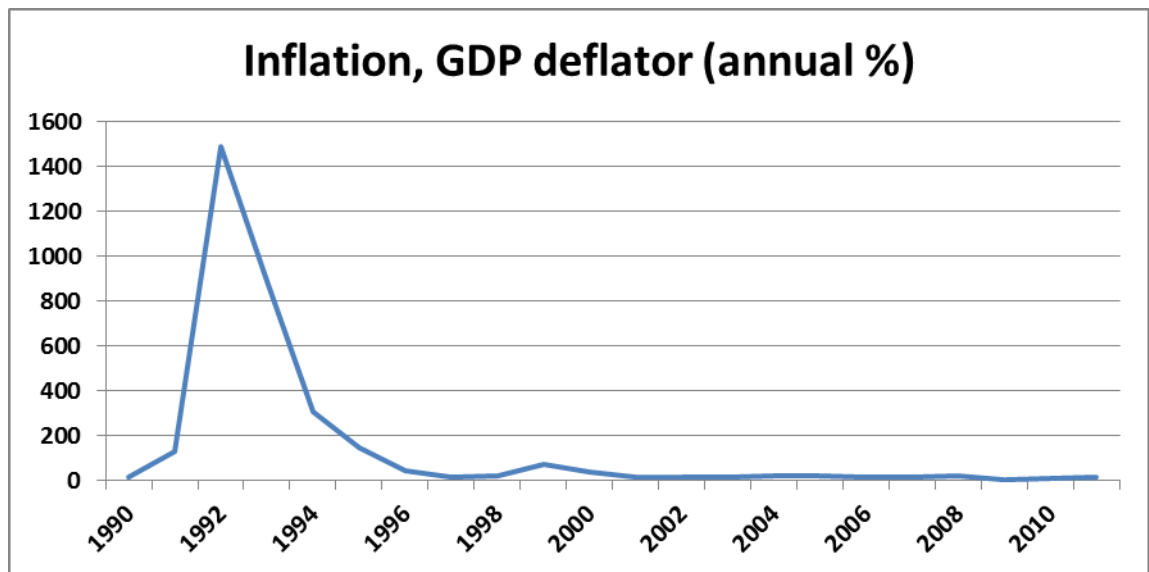
Figure 3.2: Inflation, GDP deflator (annual %) (1990-2010)
   Source: *World Bank (2013).*

From the Figure 3.2 we see that until the collapse of the Soviet Union inflation rate was at its lowest level, but inflation rate considerably increased after the collapse of the Soviet Union, default and through the period of Perestroika (restructuring) reaching the highest level of 2508.8% (World Bank, 2013). From 1992 until the Russian financial crisis, inflation started to decline and in 1997 the inflation rate was dropped to 11%. In 1998 because of the crisis inflation rate again went up to 84.5%. After 1998 inflation rate kept declining because Russia decided to make the ruble partially flexible. At the end of 2012 the flexibility made ruble stronger along with lower import prices, and the weak euro (World Bank, 2013).

However, with a closer look at the economy, it can be seen that oil is the main source of Russia's economic development and even the small changes in oil prices can affect the economy right away. Besides, for the first time since 2009 Russia experienced decline in industrial output in the beginning of 2013. From the second half of 2012 up to 2013 inflation remains high. So, by 2014 it is forecasted by the

World Bank that Russia's growth will be again lower than in Brazil, Turkey and South Korea (Russian Economic Report, World Bank, 2013).

3.3 Foreign Direct Investment in Russia

Russia always has been an attractive area for FDI, primarily because of its abundance of natural resources and large market. However, FDI has been unstable. From Figure 3.3 we can see that after the collapse of the Soviet Union, FDI was nearly reached zero percent of GDP which means that there was almost no foreign investment in Russia. Nevertheless, FDI in 2008 (before the crisis) reached its highest point of 4.52% and by 2009 FDI considerably declined to 2.99% (WorldBank, 2013).

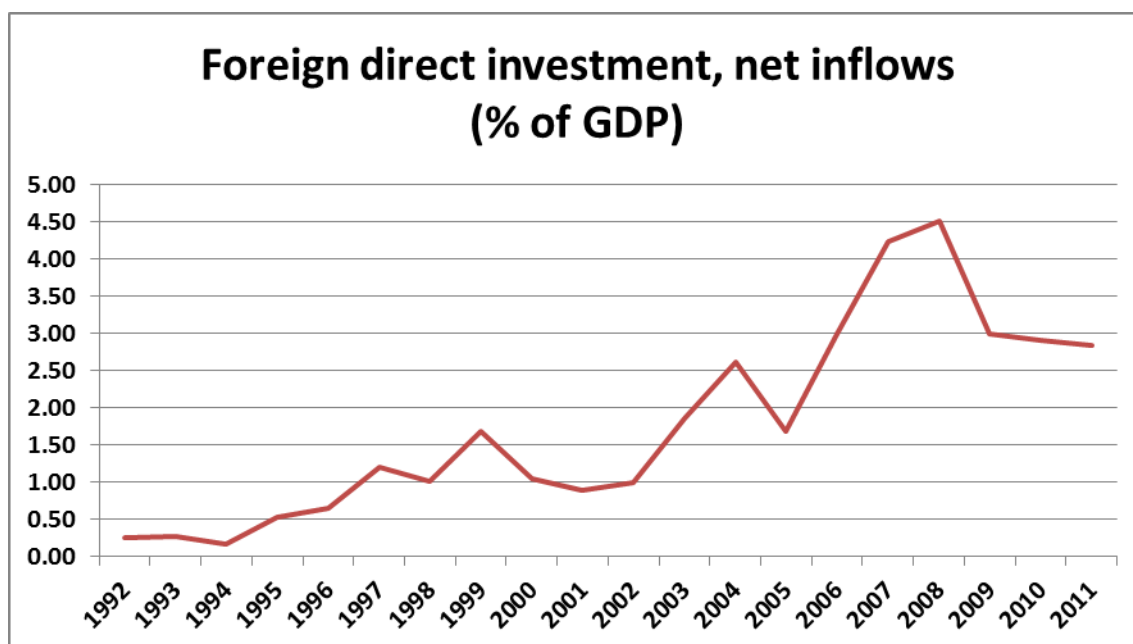Figure 3.3: Foreign Direct Investment, net inflows (% of GDP) 1992-2011
  Source: *World Bank (2013).*

After a sharp decline in 2008, FDI recovered again and by 2010 it was recorded to be $43 billion. In 2011 FDI inflow increased to $53 billion. With the past crisis, recovery of FDI in Russia was still beyond China, India and Kazakhstan regarding the FDI stock. However, every year the number of mergers and acquisitions by

multinational companies is rising in Russia and at the same time many greenfield FDI projects are attracted to the country. Despite the global financial crisis of 2008, many greenfield FDI projects that were postponed during the crisis were completed by 2010-2011. The recovery of FDI was also seen in the construction sector (World Bank, 2013).

The global financial crisis exposed the weak sides of investment climate including complicated relations between private and state owned companies. In 2010 Russian President Dmitry Medvedev made new reforms in the system for attracting FDI inflows, such as reducing the bureaucracy regarding customs procedures, easing the migration procedures so that foreign skilled personnel could be brought in, privatizing state owned enterprises, easing access to infrastructure, liberalizing the legal system. However, by the 2012 only some of these reforms were implemented and the rest is still under the process. Meanwhile, Russia has undergone through two important foreign policy steps. First, in 2010 the Eurasian Economic Union was established forming a customs union between Russia, Kazakhstan and Belarus, and by 2015 a common market is planned with more ex Soviet countries. Second, after 18 years of negotiation, Parliament finally ratified the accession of Russia to the WTO in 2012. Afterwords, Russia became a member of the OECD and the FDI regime of Russia is going to be changed according to OECD norms. Consequently, all these reforms are promising to have favorable environment to attract more FDI inflows to the country (Kuznetsov, 2012).
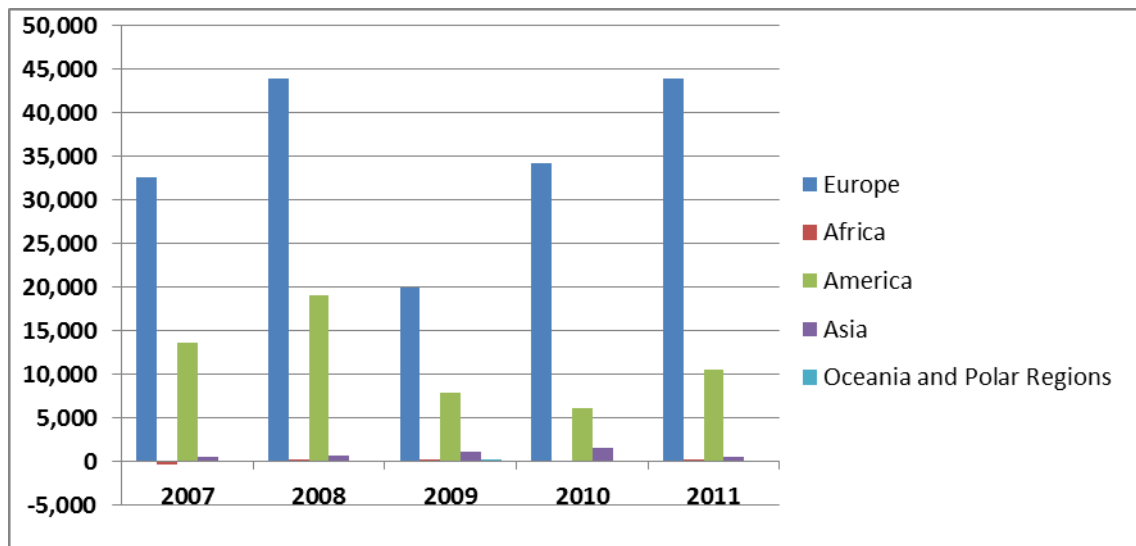
Figure 3.4: FDI in Russia (By Country, Million USD) 2007-2011
  Source: *Central Bank of the Russian Federation (2013).*

As we can see from Figure 3.4 Europe (mainly the Netherlands, Ireland, Luxembourg and Germany) has the biggest share of FDI in Russia from 2007-2011. The trend was increasing until 2008, but after the global financial crisis, many European countries took their investments out of the country. Nevertheless, FDI from Europe started recovering at a faster pace reaching 43,871 Million USD by 2011 (Central Bank of the Russian Federation, 2013). The second biggest supplier of FDI after Europe is America (mostly Caribbean – British Virgin Islands) which is almost 11 Million USD. In 2010 FDI from Asia reached 1585 Million USD while in 2011 it started to decline again. On the other hand, FDI from Africa and Oceania and Polar Regions was almost at zero level all the time.

3.4 Domestic Savings in Russia

The difference between total consumption and GDP is defined as Domestic Savings. Domestic Savings has two components: Private sector and public sector. The private sector is mainly consisted of the household sector.

Household savings are one of the important aggregate for the economic development. Therefore, to increase the household savings, Russia should have a stable financial sector, developed social insurance system and market-supporting institutions (Foley and Pyle, 2005).

Many of the researches state that Russia's private savings can be improved only by increasing the income of the households. However, Kuzina (2005) believes that the low rate of private savings in Russia is not driven by low income, but rather it is caused by lack of adequate financial tools, lack of trust on financial institutions and the financial system as whole. In the Russian Vedemosti magazine, the research made by Sean Guillory and Joera Mulders shows that for the last 20 years private savings reached its maximum level with 70% increase. This result proves the development of the economic situation in Russia. 60% of survey respondents keep their savings in rubles and this shows that citizens are confident in financial system.

As we can see from the Figure 3.5, the peak in domestic savings reached in 1992 which was almost 50% of GDP. Then steep decline was recorded until 1998. Only 10.7% of total savings were kept in the banks, because of the crisis and collapse of the Russian financial system, and the rest had a feeling of distrust on Russian banks.
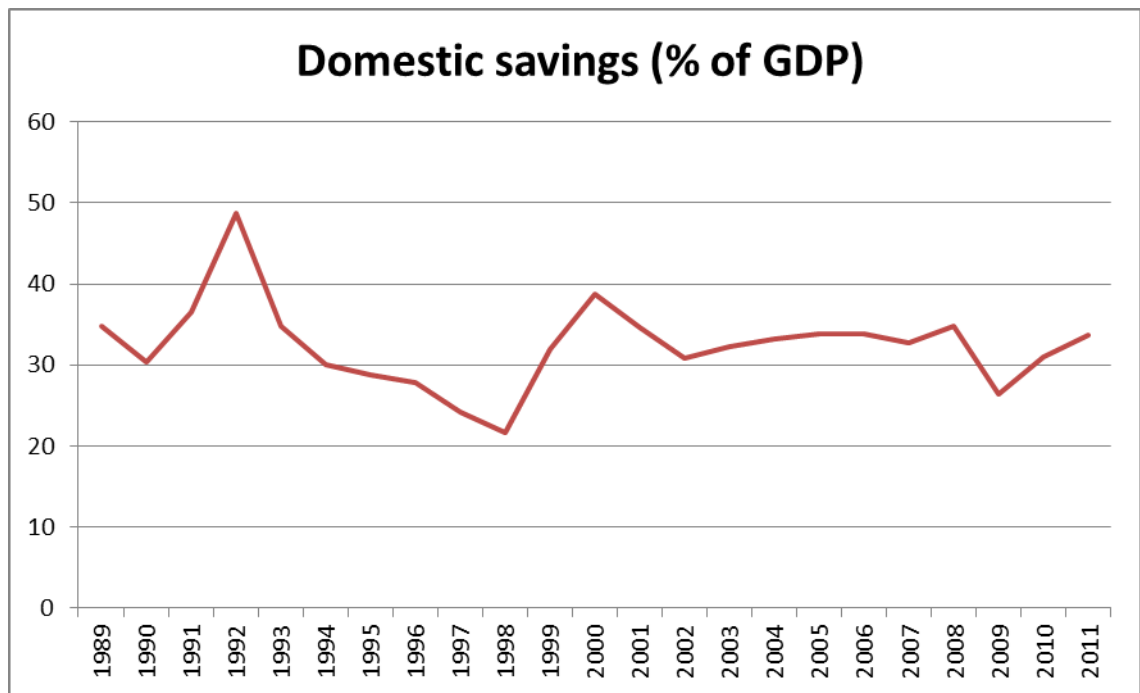
Figure 3.5: Domestic Savings of Russia (% of GDP) (1989-2011)
  Source: *World Bank (2013)*

Nevertheless, there was a strong recovery after the crisis period and domestic savings
again started to grow. In 2000 domestic savings increased to almost 40% of GDP
after which it became more volatile.

During financial crisis in years 2008-2010 domestic savings fell dramatically. This
occurs because of the fall in private savings. The data for private and public sector
have been calculated through these formulas:

Public Savings = Taxes Revenue – Government Expenditure

Private Savings = Domestic Saving – Public Savings
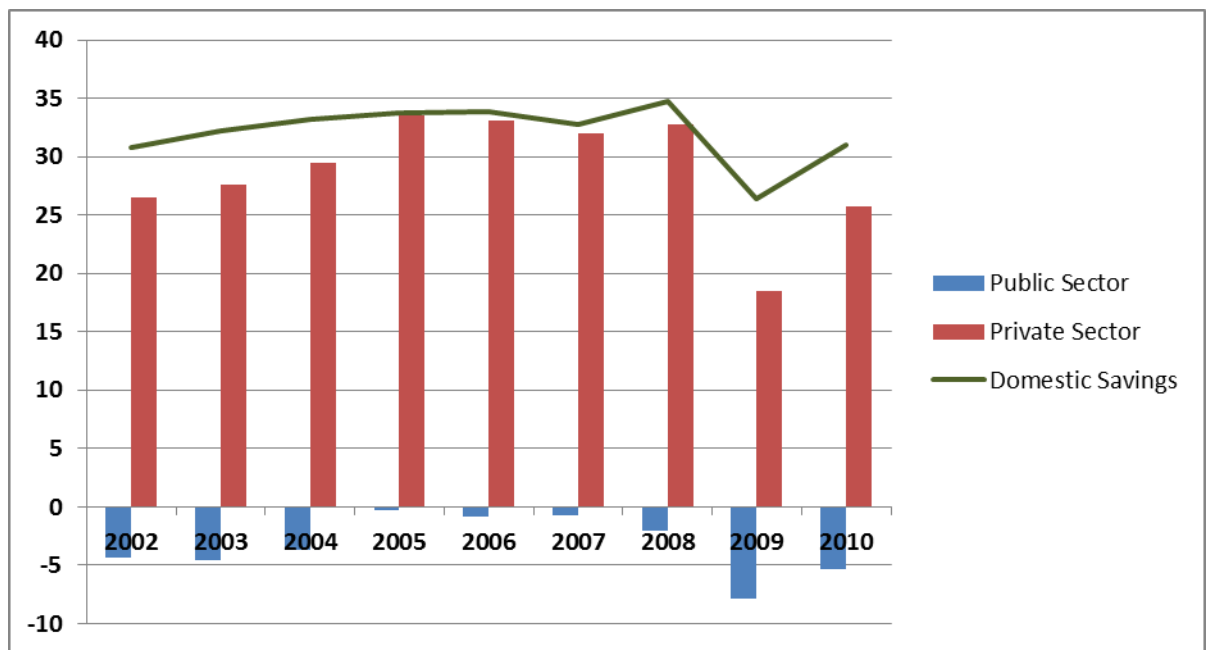
Figure 3.6: Composition of Domestic Savings (% of GDP) (2002-2010)
  Source: *World Bank (2013)*

As it is clearly seen in the diagram above in Figure 3.6, that the main driver of domestic savings is private savings. Therefore, during the global financial crisis private savings were the main reason in the sharp fall of domestic savings. Meanwhile, public sector's savings are negative since 2002 up to the present time.

Chapter 4

DATA AND METHODOLOGY

4.1 Data

In this research annual data, from 1989-2011, are used for Domestic Savings, Foreign Direct Investment, Gross Domestic Product variables: the annual data have been transformed into quarterly data via the formulae contained in Gandolfo (1981). Data is collected from World Bank (2013) website. GDP figures are presented in constant 2000 US dollars and FDI with DS figures in percentage of GDP.

4.2 Methodology

Four types of analysis were applied in this study. First one is Multiple Regression Analysis which is conducted to identify the correlation among dependent and independent variables. Second, to test stationarity of the variables the following tests are applied: Augmented Dickey Fuller (ADF) and Phillips Perron (PP). Third, Johansen cointegration test is applied to check the long run relationship between explained and explanatory variables. Lastly, Granger – Causality test is employed to asses the causality among variables.

4.2.1 Empirical Model

Many researches were undertaken concerning the determinants of real income of the countries. Different econometric analyses were applied in order to test the real income determinants. This study assumes that FDI and DS may be the determinants of GDP in Russia.

4.2.2 Multiple Regression

The regression analysis explains the correlation between the variables. Each of the independent variable can be separately regressed in order to find the separate relationship to the dependent variable, but it is of a greater use to regress both of the independent variables to see the overall effect of explanatory variables on explained variable (Brooks, 2008).

The model of multiple regressions can be explained as follows:

$$y_t = \beta_1 + \beta_2\, x_{2t} + \beta_3\, x_{3t} + \dots + \beta_k\, x_{kt} + \mathcal{E}_t \qquad\qquad (1)$$

where,

x_{2t}, x_{3t}, ... , x_{kt} are a set of independent variables, which are considered to influence y.

β_1, β_2, β_3, ... , β_k are the coefficient estimates, which shows the effect of each independent variable on y.

$\mathcal{E}_t$ is the error term.

To carry the regression analysis, ordinary least squares estimation technique is applied. The second estimation method is maximum likelihood method. The advantage of the former estimation method is its practicality in terms of statistical properties which are obtained applying the classical linear regression model's assumptions. They cover three groups of assumptions:

1. Linearity in the parameters of the regression model.

2. Statistical properties of disturbance.

3. Properties of independent variables, and overall sample data.

Obeying the classical linear regression model assumptions is essential to obtain the true regression estimates, and we can observe it if we take a look at the function:

$$Y_t = \beta_0 + \beta_1 X_{1t} + u_t \qquad (2)$$

The true value of dependent variable, and β_i coefficients depend on independent variable and error term, which have to be correctly specified and applied. For this classical linear regression model useful, because statistical properties of its assumptions are the specific rules to be followed to obtain true results for regression estimates.

In order to go further with estimates of regression we assume that the model (1) satisfies the statistical properties of the classical linear regression model.

In this respect the β_0 and β_1 coefficients are obtained through the following formulas:

$$\hat{\beta}_1 = \frac{\Sigma_i x_{iY_i}}{\Sigma_i x_{i2}} \qquad (3)$$

$$\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X} \qquad (4)$$

where,

X and Y bar are the average of dependent and independent variables.

Obtained β_i coefficients can be tested by setting a hypothesis,

H_0: $\beta i = 0$

and applying t-test to check the validity of the hypothesis. It is obtained through the following formula:

$$t_{\widehat{\beta}} = \hat{\beta}_j / se(\hat{\beta}_j) \qquad\qquad (5)$$

The t-test is the statistical inference that tests the coefficient of the $\beta_{i,}$ whether it is equal zero or differs from zero. If it differs from zero, then H_0 hypothesis is rejected and the hypothesis,

H_1: $\beta_i \neq 0$

 is accepted based on significance levels of the t-test statistics. The significance levels check the hypothesis at 1%, 5% and 10% levels. An Eviews package that we use in order to carry the regression, reports the t-statistics with its p-values,

$P(|T| > |t|)$,

where,

T – random variable with degrees of freedom n-k-1

t – test statistic.

The t-statistic and p-values are essential tools to check the significance level of the β_i coefficients through checking the empirical proofs of the hypothesis.

4.2.3 Unit Root Tests

Unit root tests are usually applied to determine whether the variables are stationarity or non-stationary. The same test has been conducted by Sridharan P. et al. (2009). If any of the time series variables has constant mean, constant variance and constant autocovariances, the series defined to be stationary. However, in some cases the

variables can be non-stationary as well. There are three reasons why series needed to be tested for stationarity and non-stationarity:

Firstly, the behavior and properties of the series can be significantly influenced if variables are stationary or otherwise. Secondly, Spurious Regression can be obtained, if there is non-stationary data. When independent variables, which are stationary, are regressed between each other R^2 is expected to be considerably low because these variables have no relationship between each other. But, over time the regression of variables could have high R^2, so with standard regression techniques used for non-stationary data, the result will give high R^2, which is misleading. Lastly, the t-statistics and F-statistic will not be accurate for asymptotic analysis, if variables in the regression model are non-stationary (Brooks, 2008).

The process of unit root test starts with the following equation:

$$Y_t = \rho Y_{t-1} + \varepsilon_t \tag{6}$$

where,

Y_t – is dependent variable

ρ - is degree of correlation

Y_{t-1} – is one lag of the dependent variable

ε_t – is error term.

The t value of coefficient Y_{t-1} follows the **τ (tau) statistic** was proposed by Dickey and Fuller (Dickey and Fuller, 1979). In the literature Dickey – Fuller test is itself the tau statistic. The Dickey and Fuller test is focused on models:

Y_t - random walk: $$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t \tag{8}$$

Y_t - random walk with drift: $$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \varepsilon_t \tag{9}$$

Y_t - random walk with drift
and with deterministic trend: $$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \varepsilon_t \tag{10}$$

In each above mentioned forms hypotheses are:

H_0: $\delta = 0$ (time series has unit root).

Alternative hypothesis: H_1: $\delta < 0$ (time series does not have unit root, perhaps around a deterministic trend) (Gujarati and Porter, 2009).

Similar to Dickey – Fuller test there is also Phillips – Perron (PP) test, but PP test makes an automatic correction to DF test to find autocorrelation between variables (Brooks, 2008). The PP method can be an alternative to Dickey Fuller approach if moving average components are detected in the time series.

4.2.4 Co – integration Tests

In this thesis cointegration test is used to identify long-term connection between the variables. To test the variables for their co-integrating relationship both Engle – Granger (1987) co-integration test and Johansen and Juselius (1990) approach can be applied. Katırcıoğlu and Naraliyeva (2006) applied Johansen co-integration test to examine the longrun relationship between GDP, FDI and DS.

Engle – Granger use the following models to find the co-integration:

$$Y = \beta_0 + \beta_1(X) + u_t$$
$$\Delta u_t = \beta u_{t-1} \tag{11}$$

The validy of a long run relationship is confirmed, if β in the latter formula is statistically significant compared with critical values of ADF test, then the model of the first equation is not spurious. Engle – Granger test is simply an ADF test on the error term without drift and trend (Gujarati and Porter, 2009).

The Johansen and Juselius approach is superior over the Engle – Granger test in that Johansen one detects multiple relationships. Thus, Engle – Granger test does not consider the existence of multiple cointegration relationships.

The Johansen test can be formulated with the given VAR model:

$$X_t = \Pi_1 X_{t-1} + ... + \Pi_K X_{t-K} + \mu + e_t \tag{12}$$

where,

$X_t, X_{t-1} ..., X_{t-k}$ – vectors of lagged values of P variables

$\Pi_{1...}, \Pi_K$ – coefficients

μ – vector intercept

e_t – error term.

Testing the existence of co-integration relationship can be obtained through computation of trace statistic. The following is the trace statistic formula:

$$\lambda_{trace} = -T \sum Ln(1 - \lambda_i) \tag{14}$$

The null hypotheses are:

H_o: r = 0 H_1: r ≥ 1

H_0: r ≤ 1 H_1: r ≥ 2

H_0: r ≤ 2 H_1: r ≥ 3

Rejection of the null hypothesis is when the null hypothesis is lower than the trace statistic meaning that there is co-integration relationship.

4.2.5 Error Correction Model

In addition to determining a long run association between variables, an Error Correction Model helps us to check the short term relationship dynamics between y and x. Error Correction Model checks on what speed dependent variable retrieves to equilibrium when independent variable changes (Wooldridge, 2009). The following is the Error Correction Model:

$$\Delta lnGDP_t = \beta_0 + \beta_1\Delta lnGDP_{t-1} + \beta_2\Delta lnFDI_{t-1} + \beta_3\Delta lnDS_{t-1} + \beta_4\,\varepsilon_{t-1} + u_t \qquad (15)$$

where,

ε_{t-1} –Error Correction Term (ECT) with 1 lagged

The model shows how each period disequilibrium is close to the correct equilibrium (Brooks, 2008).

4.2.6 Granger Causality Test

The causality test is used in this study to define whether changes in x causes y. Thus, if x causes y, in the equation of y the lags of x should be considerable. If this is so, then this case is called to be that x variable "Granger – causes" y variable.

Alternatively, if changes in y causes x, then in the equation of x the lags of y should be significant. There also can be seen bi-directional causality if both sets of lag are considerable. Variable x can be significantly exogenous in the equation of y if x is Granger-cause y. However, if no lags are statistically significant in variable's equations, then we say that x and y are independent (Brooks, 2008).

Chapter 5

EMPIRICAL RESULTS

5.1 Multiple regressions

The econometric analysis of time series variables will be carried by using multiple regressions.

The functional form of variables in this study can be formulated as follows (Katırcıoğlu and Naraliyeva, 2006):

GDP = f (FDI, DS)

In order to conduct multiple regression analysis we used the following model:

$$GDP_t = \alpha + \beta_1 FDI_t + \beta_2 DS_t + e_t \tag{1}$$

where,

GDP_t - dependent variable in time t

α – constant for FDI, DS and GDP in a country

$\beta_{1,2}$ – slopes of coefficients showing the correlation

FDI_t - independent variable in time t

DS_t – independent variable in time t

e_t – error term

In order to notice the growth effects we convert all the variables into natural logarithm (Katirciouglu, 2009) and model (1) can be expressed as the following model.

$$\ln GDP_t = \alpha + \beta_1 \ln FDI_t + \beta_2 \ln DS_t + \varepsilon_t \tag{2}$$

Table 5.1: Multiple Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.34035	0.331306	73.46787	0.0000
LFDI	0.177040	0.017121	10.34041	0.0000
LDS	0.597673	0.095555	6.254729	0.0000
R-squared	0.631824	Mean dependent var		26.44740
Adjusted R-squared	0.622261	S.D. dependent var		0.228186
S.E. of regression	0.140244	Akaike info criterion		-1.054086
Sum squared resid	1.514467	Schwarz criterion		-0.964760
Log likelihood	45.16345	Hannan-Quinn criter.		-1.018273
F-statistic	66.06943	Durbin-Watson stat		0.139011
Prob(F-statistic)	0.000000			

As we see from Table 5.1. LFDI, LDS and intercept have probability value of zero which are lower than 1 % level resulting in the existence of a association between FDI, DS and GDP; the result is consistent with Foley and Pyle (2005) and Ogutcu (2012) findings. The former explores a positive correlation between DS and GDP, the latter finds positive relationship between FDI and GDP.

As long as $\beta_1 = 0.177040$, correlation between two variables is positive, meaning that 1 percent increase in FDI will increase GDP by 0.17%.

$\beta_2 = 0.597673$, positive correlation is observed among DS and GDP; so that 1% increase in DS leads to 0.59% increase in GDP.

t-statistic of FDI = 10.34, which is statistically significant and shows strong correlation between FDI and GDP.

t-statistic of DS = 6.25, which is again considered to be statistically significant and shows the correlation between DS and GDP.

$R^2 = 0.63$, which means that 63% variation in GDP is explained by FDI and DS.

5.2 Unit Root Tests

In order to conduct Unit Root tests, Augmented Dickey-Fuller and Philips-Peron tests are used. The statistical results for both tests for observing stationarity of the time series are given in Tables 5.2 and 5.3.

Gujarati (2009) stresses that the majority of the economic time series is mostly integrated of order one. Hence, GDP, DS, and FDI used in the analysis should be stationary after taking their first differences, because the time series is economic variables. The results for PP and ADF tests show the rejection of the null hypothesis for all time series after taking their first differences, meaning that our series are non-stationary of integrated $I(1)$.

Table 5.2: Augmented Dickey-Fuller Test for Unit Roots

Statistics (Levels)	ln GDP	Lag	ln DS	Lag	ln FDI	Lag
τ_T (ADF)	-1.87	(0)	-2.55	(0)	-2.22	(0)
τ_μ (ADF)	-0.44	(0)	-2.59[***]	(0)	-1.58	(0)
τ (ADF)	0.24	(0)	-0.15	(0)	-1.23	(0)
Statistics (First Difference)	**ln GDP**	**Lag**	**ln DS**	**lag**	**ln FDI**	**Lag**
τ_T (ADF)	-2.74	(3)	-9.33[*]	(0)	-8.90[*]	(0)
τ_μ (ADF)	-2.14	(3)	-9.38[*]	(0)	-8.90[*]	(0)
τ (ADF)	-2.14[**]	(3)	-9.43[*]	(0)	-8.77[*]	(0)

Note:
τ_T indicates the model with a drift and trend; τ_μ - the model with a drift and without trend; τ is the most restricted model without a drift and trend. Lag lengths are used by applying Akaike Info Creterion with maximum 4 lags.
[*], [**] and [***] stand for rejection of the null hypothesis at the 1%, 5% and 10% levels respectively.

The PP is superior to ADF test, because the foremost one automatically corrects the autocorrelation between variables, and the statistical results are significant at the 1 %

level of each model; nevertheless, the statistical results of the ADF test show the statistical significance of the time series at I(1) either.

Table 5.3: Philips-Perron Test for Unit Roots

Statistics (Levels)	ln GDP	Lag	ln DS	Lag	ln FDI	Lag
τ_T (PP)	-1.86	(13)	-2.74	(3)	-2.31	(2)
τ_μ (PP)	-0.44	(0)	-2.77***	(0)	-1.58	(1)
τ (PP)	0.24	(0)	-0.15	(0)	-1.24	(1)
Statistics (First Difference)	ln GDP	Lag	ln DS	lag	ln FDI	Lag
τ_T (PP)	-10.27*	(6)	-9.33*	(0)	-8.91*	(2)
τ_μ (PP)	-9.38*	(0)	-9.38*	(0)	-8.90*	(1)
τ (PP)	-9.43*	(3)	-9.43*	(0)	-8.77*	(0)

Note:
Numbers in brackets indicate Newey-West bandwith.

5.3 Co-integration Test

By now we identified that GDP, DS and FDI time series are integrated of the same order. In this regard, Johansen co-integration test can be applied to check the existence of long-run equilibrium relationship among variables. Table 5.4 shows the statistical results for Johansen approach.

The trace statistic (computed value) is 97.28, and it is greater than the critical values at 1% and 5%. This suggests the rejection of the first null hypothesis, there is no co-integrating vectors. The second null hypothesis stating there is at most 1 co-integrating vector is rejected at the 5 % significance level. The third hypotheses of Johansen test, stating there are at most 2 co-integrating vectors have not been observed.

Thus, the validity of long-run equilibrium relationship can be observed at 1% and 5% significance levels confirming validity of at least 1 co-integrating vector between dependent (GDP) and regressors (FDI, DS),

Table 5.4: Johansen Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.652087	97.28209	29.68	35.65
At most 1 *	0.199725	17.04117	15.41	20.04
At most 2	0.001425	0.108365	3.76	6.65

Trace test indicates 2 cointegrating equation(s) at the 5% level
Trace test indicates 1 cointegrating equation(s) at the 1% level
*(**) denotes rejection of the hypothesis at the 5%(1%) level

5.4 Error Correction Model

The validity of the long run equilibrium relationship in the model is statistically proven by Johansen approach, and now a coefficient of long-run equilibrium relationship should be identified. A Vector Error Correction Model is applied to estimate the long-run equilibrium coefficient.

In Table 5.5 the statistical results of Error Correction estimation are shown. The estimations are received at lag 3, because only in this lag the highest negative value for error correction term, -0.0939, is obtained, meaning that by the contribution of FDI and DS, every quarter values of GDP approach the long run equilibrium level by 9.39% speed of adjustment. It is statistically significant at the 1 % level. The existence of the long-run relationship has been found by Sridharan P. et al. (2009) in the case of Russia but for the period of 1994-2007. By investigating the impact of the FDI on the growth of the country, they find the higher error correction term per quarter, -0.436, which is statistically significant.

Table 5.5: Error Correction Model Estimates

Error Correction:	D(LGDP)
CointEq1	-0.093928
	(0.02459)
	[-3.81929]
D(LGDP(-1))	-0.326041
	(0.16517)
	[-1.97396]
D(LGDP(-2))	-0.326041
	(0.16517)
	[-1.97396]
D(LGDP(-3))	-0.326041
	(0.16517)
D(LDS(-1))	-0.018664
	(0.06052)
	[-0.30839]
D(LDS(-2))	-0.018664
	(0.06052)
	[-0.30839]
D(LDS(-3))	-0.018664
	(0.06052)
	[-0.30839]
D(LFDI(-1))	-0.001471
	(0.01800)
	[-0.08169]
D(LFDI(-2))	-0.001471
	(0.01800)
	[-0.08169]
D(LFDI(-3))	-0.001471
	(0.01800)
	[-0.08169]
C	0.008337
	(0.00426)
	[1.95918]
R-squared	0.185870
Adj. R-squared	0.060619
Sum sq. resids	0.071646
S.E. equation	0.033200
F-statistic	1.483982
Log likelihood	156.8972
Akaike AIC	-3.839401
Schwarz SC	-3.502058
Mean dependent	0.004280
S.D. dependent	0.034255

5.5 Granger Causality Test

The existence of long-run equilibrium relationship and its coefficients are identified in the previous tests. The next step is to run the Granger Causality Test to see the relationship between GDP, FDI and DS, whether one granger causes another variable. The results are shown in the Table 5.6. As we can see from the table only the null hypotheses stating that FDI does not Granger Cause GDP is rejected at the 1 % significance level, meaning that FDI does granger cause GDP. Other null hypotheses and granger relationship between variables are not statistically proved. The result confirms the findings of Ogutcu (2012) exploring a positive effect of the flow of FDI to real income in Russia, because of Russia's natural resources, skilled workforce and large population.

Table 5.6: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
LDS does not Granger Cause LGDP	89	0.48374	0.6945
LGDP does not Granger Cause LDS		0.36976	0.7750
LFDI does not Granger Cause LGDP	77	4.26482	0.0080
LGDP does not Granger Cause LFDI		0.16072	0.9224
LFDI does not Granger Cause LDS	77	0.61977	0.6045
LDS does not Granger Cause LFDI		0.65590	0.5819

Chapter 6

CONCLUSION AND POLICY IMPLICATIONS

6.1 Conclusion

The current research emphasizes the relationship between domestic savings, foreign direct investment and economic growth of Russia. Russia is a developing economy and becoming a tempting investment area for foreign investors, although it is still under the transition process.

Results generated from multiple regression analysis reject the null hypothesis of DS and FDI being equal to zero, indicating statistical significance of the positive relationship between real income, domestic saving and foreign direct investment. The ceterus paribus, the higher increase in real income is observed, through an increase in DS than in FDI, with a 0.42% difference per quarter. It shows that Russia's economic growth mostly relies on an endogenous factor DS. In addition, the long run equilibrium relationship between GDP, DS and FDI is obtained, with 9.39% speed of adjustment coefficient, statistically proving at 1% significance level approaching GDP to the long-run equilibrium level. The granger causality test shows that only FDI granger causes GDP in the long run, but the other possible directional causality relationship between GDP, DS and FDI not proved statistically.

6.2 Policy Implication

Russia is the biggest country in the world not only by the geographical territory but also with its large gas and coal reserves, and it is one of the biggest oil and gas producers. In addition, Russia is in a top for steel and primary aluminum exports. Russia's real income starts to grow dramatically with Putin government in the late 1990s and the beginning of 2000s, implementing new reforms in taxation, business environment, decreasing the monopoly. All these contributes positively to the inflow of foreign investments. As a result, our empirical analysis suggests that Russia's GDP increase is driven basically by domestic savings and by FDI, which is one of the sources of having growth in real income. The public sector and financial sector are other important factors that Government should improve, as the domestic and private savings depend on them. In this respect, increasing the domestic savings increase the real income, which is statistically proven by our analysis. According to the annual World Bank report, Russia takes 112th place in a world based on doing business ratings. The Government should work on business, investment climate of the country, and try to ease the procedures in order to establish favorable conditions for investors.

6.3 Suggestions and Recommendations

Further research can be suggested to check the existence of short-run impact of FDI on GDP, as we obtained significance level for directional causal relationship of FDI on GDP under Granger causality test. Seasonal co-integration can be applied to get more rigid results due to structural format of the data. It would be suggested to apply bound test of Pesaran approach and structural breaks, because while observing the time series data we see the periods when there are dramatic decrease and increase especially in FDI and DS.

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