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**Analysis of currency exchange rate regime and its
effect on economy in four post-soviet countries:**

Russia, Kazakhstan, Azerbaijan, Georgia

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Declaration of Authorship

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1 Introduction

Exchange rate regimes are believed to have significant effect on economy of the countries, as they can directly affect trade, foreign investment and economic growth. Choice of an exchange rate regime is an important decision made by national monetary authorities. Therefore, national monetary authorities face with crucial decisions regarding the choice of this element of monetary policy, as country fundamentals, economic history and current economic standing of the countries must be accounted for as well. Historically, developing countries as well as some transition economies used to set fixed exchange rate regimes, usually pegged to major currency (US dollar) or basket of foreign currencies. Underdeveloped economic market, absence of free flow of capital and financially sustainable trade and inefficient fiscal policies often leads to pegged exchange rates. Other times, monetary authorities use fixed exchange rates as nominal anchor and using them as a tool to achieve low and stable inflation.

Following paper will focus on analyzing exchange rate regimes and their effect on selected economic indicators in four countries. Selected countries for analysis are: Russia, Kazakhstan, Azerbaijan and Georgia. Interest to analyze these countries arises from the recent political and economic history these countries shared, as until 1991 before-mentioned countries have been part of the one large closed economy, with shared financial market and currency.

Main focus is on establishing relationship between currency exchange rate regime and selected economic indicators. The main question of the research is: Does the exchange rates and exchange rate arrangement affect economy in following countries: Russia, Kazakhstan, Azerbaijan and Georgia? General theoretical assumption is that choice of an exchange rate regime affects domestic economy through exchange rate channel. In order to analyze this effect and consequences on economy, following economic indicators were chosen: GDP growth, inflation, foreign direct investment, exports & imports.

Related theory and academic literature do not have definitive conclusion on the existence of the exchange rate regime effect on economic growth. Some researchers were able to establish clear effect of exchange rate arrangement to economy, mainly economic growth and inflation. However, other conclusions from academic literature stipulate the opposite, making it impossible to reach unambiguous conclusion. Moreover, very little amount literature exists on this topic concerning CIS economies. Existing studies slightly cover Russian Federation, but Kazakhstan, Azerbaijan and Georgia are almost not covered in this area of research. This paper will try to contribute to the existing gap in the literature.

This paper will analyze how exchange rates and currency regime influenced GDP growth, inflation, exports& imports and foreign direct investment in selected countries during 2007-17. Moreover, paper will try to explain reasons behind choice of particular regimes and whether they were sustainable and efficient for domestic economies. That said, main target of this thesis is to establish relationship between real effective exchange rates and before-mentioned economic indicators. Moreover, research will try to define how particular exchange rate arrangement influenced economies of the countries.

1.1 Background

Following the collapse of Soviet Union in 1991, economic and monetary stability was very hard to achieve for the countries. After partition of “rubble area”, mentioned countries experienced hyperinflation caused by financial instability and inefficient fiscal policy. The national currencies were adopted in the middle of 1990s. Weak positions of newly adopted domestic currencies resulting from young and not efficiently functioning economies, was negatively affecting economic indicators. Therefore, for many years Central Banks of the Commonwealth of Independent States (CIS) countries were stimulating fixed exchange rate regime, supporting the strong position of national currencies against US dollar by injecting substantial amounts of foreign currency in to

economy. Most common practices were foreign exchange intervention and short-term interest rate manipulation.

Existing research done on CIS economies mostly covers period of early transition years during 1990s. The following decades associated in with rapid, but not always economically efficient development of young economies. This research will contribute to limited literature of studies of CIS economies during first a second decade of 21st century.

The observed years include years of global economic and financial crisis, as well as period 2013-15 which is associated with currency crisis and following change in exchange rate regime in the four countries.

Data used in the study is available cross-country statistic, as well as information provided by International Monetary Fund (IMF), World Bank, Organization for Economic Co-operation and Development (OECD). Paper considers country's de facto regimes as defined by IMF.

2 Definition of exchange rate regimes

According to IMF de facto classification of exchange rates, there are four different types of exchange rate regimes countries adopt. Hard pegs, soft pegs, floating and residual types. Hard pegs, on one extreme are associated with no monetary sovereignty exercised by national governments, whereas floating regime lying on the other extreme is associated with biggest monetary sovereignty. Positioned between these two extremes, there is soft peg which is also called intermediate exchange rate regime. Hard peg or fixed exchange rate regime has 2 categories, which are exchange arrangement with no separate legal tender and currency board arrangements.

1: Classification of De-facto exchange rate arrangements

Type	Category				
Hard peg	Exchange rate arrangement with no separate legal tender	Currency board arrangement			
Soft peg	Conventional pegged arrangement	Pegged exchange rate with horizontal band	Stabilized arrangements	Crawling peg	Craw-like arrangement
Floating regime	Floating	Free-floating			
Residual	Other managed arrangement				

Source: Classification of Exchange Rate Arrangements (Annual Report on Exchange Arrangements and Exchange Restrictions, IMF 2017)

Pegged or fixed regime refers to exchange rate policy where government anchors or channels its exchange rate to other country's currency, thus stabilizing exchange rate between those currencies. The extreme version of peg, which is hard peg can be implemented in the form of exchange rate arrangement with no separate legal tender, where some foreign country's currency acts as a medium of exchange in economy. This type is also associated with absence of monetary policy flexibility. Another form of hard peg can be exercised in form of currency board arrangement, which implies full convertibility of local currency into units of foreign currency at a fixed exchange rate. Strictly fixed exchange rate regime is backed by huge foreign currency reserves. In this case, currency board perform the role of monetary authorities, instead of Central Bank. However, unlike Central Banks, currency boards do not act as lender of

last resort and have no power to affect monetary policy. Therefore, interest rates as well as inflation rate in the country with currency board are always similar to interest rates and inflation rate in the anchor country.

Soft peg regimes are also called intermediate exchange rate regimes, as they fall between hard peg with virtually no monetary sovereignty and floating regimes with largest amount of monetary sovereignty. Pegged currency regimes are associated with increased confidence in monetary policy, which stimulates higher investment and economic growth due to stable position of domestic currency. The fastest economic growth (more than 2% annually) was found to exist among countries with soft peg arrangements (Ghosh et.al, 1995). Intermediate arrangements can be viewed as convenient for non-industrialized or developing countries, with weak economic standing and unstable position of domestic currency, whereas industrialized countries are better off under floating regimes. However, it is worth mentioning that countries that use pegs are prone to suffer the monetary crisis, as pegged regimes can cause the country to lose its competitiveness internationally. There are several categories of regimes that fall under soft pegs.

Conventional pegged arrangement refers to the case when country pegs its currency at a fixed rate to the foreign currency. This arrangement has similarities with previously discussed currency board, however, under conventional pegged arrangement, Central Banks act as monetary authority, decides on monetary policy, can raise or lower interest rates and participates in foreign exchange market transactions.

Domestic currency can also be pegged to the basket constituting multiple foreign currencies. Choice of currencies to include in the basket is closely related to trade and financial partners.

Under pegged exchange rate with horizontal band, value of currency is managed within specific margins of fluctuation, which is at least ± 1 percent around a fixed central rate (IMF, 2006).

Stabilized arrangement refers to spot market exchange rate that stays within a margin of 2% for the period of at least 6 months and is not floating. Domestic currency can be linked to either single foreign currency or to the basket of foreign currencies. From the chosen countries for analysis, Azerbaijan as well as Kazakhstan have been applying regime of stabilized arrangement during 2009-15 and 2014-15 respectively.

In the case of crawling peg arrangement, domestic currency is adjusted in small amounts and at a fixed rate. These adjustments maybe result of response to changes in specific financial indicators (e.g. differentials between target inflation and expected inflation in primary trade partners).

For crawl-like arrangements, currency is maintained with fluctuation margins of minimum ± 1 percent around a central rate-or the margin between the maximum and minimum value of the exchange rate exceeds 2 percent-and the central rate or margins are adjusted periodically at a fixed rate or in response to changes in selective quantitative indicators (IMF,2017).

Third type of exchange rate regimes is floating regime, which is comprised of floating and free-floating categories. Floating exchange rate is regulated by market forces. As market is a determinant exchange rate, it is not possible to predict future path of the currency or exchange rate. However, foreign exchange market intervention by Central Banks can occur, to prevent undue fluctuations in the exchange rate. (IMF, 2009). National monetary authorities can use different policies to tackle short-term movements in exchange rate. For example, to intervene to foreign exchange market by injecting currency. Employing managed floating regime and implementing various policies from time to time can be considered “least bad” for emerging economies (Goldstein, 2002).

Free floating regime is based fully on market-determined forces and foreign exchange interventions by Central Banks happen very rarely, in case of serious potential market disruptions. Free-floating regime is adopted mainly by developed economies, with strong and stable domestic currency and efficient economy. Floating exchange rate regimes can be beneficial for countries, as they

are believed to be efficient in absorbing external economic shocks, whereas for countries with pegged regimes, external economic shocks are transmitted significantly to domestic economy through change in relative prices (Friedman,1953). However, the idea of flexible regimes acting as shock absorbers, is challenged by Levy-Yeyati and Sturzenegger (2002), where authors stipulate that such position can encourage protectionist behavior and cause price distortion, therefore, leading to misallocation of resources within economy.

Other managed category which falls under residual type, is characterized by frequent shifts in policy, therefore cannot be categorized to as any of the previously mentioned regimes. Following the devaluation of domestic currency in 2016, Azerbaijan switched to other managed arrangement.

2.1 Monetary Transmission Mechanism

Main objective of Central Bank is to provide price stability, growth in line with economy's potential, moderate long-term interest rates and high level of employment. In order to achieve these objectives monetary authorities are using various monetary policy tools, depending on fundamentals of economy. Choice of exchange rate regime, also made by Central Banks is followed by consistent choice of monetary policy framework, meaning which monetary tools Central Bank uses to provide economy with a nominal anchor¹. Depending on what variable is chosen to act as a nominal anchor, three main policy frameworks can be implemented by monetary authorities: exchange rate anchor, monetary aggregate target and inflation-targeting framework.

Historically, Central Banks have been using currency peg as a nominal anchor, although in recent two decades, majority of CBs decided to target

¹ Nominal anchor is a variable used by Central Banks in order to tie down price level in the economy.

inflation levels instead, due to various reasons. Using currency peg as a nominal anchor, involves linkage of value of domestic currency to the value of foreign currency, usually to the country with low inflation. In this case, country's monetary policy closely resembles monetary policy of anchor country. Central Banks are constrained in terms of responses to external economic shocks such as terms of trade (value of country's exports to value of imports) or changes in real interest rate. For countries using exchange rate anchor as a monetary policy framework, value of domestic currency is linked to the currency of foreign country, where inflation is low. Central Bank buys or sells foreign exchange in necessary amounts to keep the exchange rate at predetermined standard. Hence, exchange rate acts as an intermediate target of monetary policy or nominal anchor. Exchange rate anchor usually is set against major foreign currency, such as US dollar, euro or composite of foreign currencies. This type of framework is mostly associated with fixed or pegged regime, such as: currency board arrangement, exchange rate arrangements without separate legal tender, stabilized arrangements, crawling pegs and other managed arrangements.

Another way for monetary authorities to control price level is by targeting growth of money supply. Monetary authorities or Central Banks may use money aggregates, such as M1, M2 and reserve money to attain desirable growth rate, where nominal anchor or intermediate target of monetary policy is chosen money aggregate. Using money aggregates as a nominal anchor can work well if CB can control money supply fairly good and if money growth is permanently related to inflation levels.

Countries adopting inflation targeting framework as a part of monetary policy, publicly announce their commitment to achieve certain levels of inflation. Usually this framework involves active communication with the public regarding plans and objectives of inflation targeting. In this case, inflation forecast acts as a nominal anchor or intermediate target of monetary policy. Central Bank announces official inflation target forecast and tries to direct actual level of inflation to the target level. In theory, CB estimates future inflation

levels and compares it to the actual inflation during the period. Any difference between those values would be an indicator of extent to which monetary policy should be adjusted.

In theory, there are two conditions that have to be met, in order for CB to use inflation targets as nominal anchor. First, CB should be able to conduct independent monetary policy and preserve its independence from government's influence. This means that CB should be able to choose appropriate instruments in conducting monetary policy. Second condition is that CB should not target any other indicators (except inflation) such as; employment, exchange rate or wages. Inflation targeting was adopted by three of studied countries: Georgia (2009), Russia (2015) and Kazakhstan (2015). Simultaneously target inflation levels were announced. Central Bank can use interest rates in order to tie down inflation in certain cases. Increase in Central Bank interest rates, lead to growth of interest rates in money market, which is causing increase of cost of funds in financial market. This consecutively affect savings and consumption decisions of people and companies. Decreased consumption and increased savings (as a result of increase in Central Bank interest rates) puts downward pressure on inflation. Additionally, increase in CB interest rates, can promote domestic currency appreciation, which also has downward pressure on inflation.

There are also cases when countries do not have explicitly stated nominal anchor, but monetary authorities rather audit different economic indicators while conducting monetary policy.

3 Literature Review

Significant previous research has been done on exchange rate arrangements and their effect on economic growth and inflation. As the main objective of this study is to analyze effect of exchange rate regimes on GDP growth, inflation, export& in selected countries, corresponding literature was chosen for review and for establishing hypothesis.

There has been a shift towards more flexible exchange rate regimes after the collapse of the Bretton Woods system in the beginning of 1970s, which stipulated fixed exchange rate regime across 44 countries, which pegged their domestic currencies to US dollar, which was pegged to the price of gold. Eventually, countries started to peg the domestic currency to basket of foreign currencies, and in the beginning of 1980s shifted totally to flexible exchange rates, instead of pegging them to any foreign currency.

Overall, choice of either fixed or flexible exchange rate regime differs for developed and developing countries, as initially countries have different fundamentals and economic standing. Developing countries are often associated with absence of reliability, lack of transparency and narrow access to international markets and capital markets. To stabilize economy and maintain stable domestic currency, national monetary authorities of developing countries tend to opt for pegged or fixed exchange rate regime, usually in the form of soft peg against major foreign currency, such as US dollar or basket of foreign currencies. Fixed exchange rates however will not let the country to conduct independent monetary policy and let the capital to flow freely. This trilemma was noted as “impossible trinity of fixed exchange rates” by R. Mundell and J.M Fleming in 1960s. Therefore, countries cannot have fixed exchange rates, conduct independent monetary policy and allow capital to flow freely at the same time (Mundell-Flemming,1960s). Monetary authorities must choose which element are more crucial and important for the country economy

3.1 Effect of currency regime and exchange rates on economic growth

The opinions regarding which exchange rate regime facilitates stable and consistent economic growth differ. Classic models mention that floating regimes are beneficial for countries that experience mainly foreign and monetary disruptions, as domestic economy can be somehow isolated from this disruption by exchange rate. However, fixed exchange rate regime is believed to be more favorable for countries with unstable economy and volatility of internal monetary and fiscal policies. Proponents of fixed exchange rates believe that there is prevailing degree of ambiguity under flexible exchange rate, which can reduce amount of foreign trade and investment, and can cause higher inflation, which is not the case for economy with fixed exchange rates. However, none of the models provides us with precise results regarding which regime is better for economic growth.

Significant research has been done on how monetary policy of the country, specifically exchange rate regime exercised by national banks affect economic growth. At the theoretical level, there is assumption that exchange rate can affect economy through trade, investment and productivity, and that fixed exchange rates can boost this process. Comprehensive review of existing theoretical and empirical literature was performed by Peterski (2009) on this matter and empirical research, did not provide with any definite conclusion, as researches concluded that pegged rates stimulate growth, while flexible rates do not, while other studies have reported opposite results (Peterski, 2009) Some part of the literature does not find any link at all between exchange rate regime and economic growth.

R. Torres (2011) in his study of 150 industrialized and non-industrialized countries focused on analyzing relationship between countries' choice of an exchange rate regimes and economics growth during 1980-2010. By applying regression analysis, where dependent variable was economic growth and

independent variable was exchange rate regime, no significant statistical relationship was found between exchange rate regime and economic growth for both group of countries (R.Torres, 2011). Similar results were concluded by Vita and Kyaw (2011) in a study of 70 developing countries in the span of 1981 to 2004, which did not find any important link between exchange rate regime and economic growth.

For 10 European transition economies² results concluded by Vujanic et.al (2017) in a research covering period from 2000 to 2014, were similar. For the countries with fixed exchange rates and less developed countries with floating rates no significant link was observed between exchange rate regime and economic growth. Result is similar for developed countries with flexible regime. However, the results are not consistent with Levy-Yeyati and Sturzenegger (2001) who reported the link between exchange rate regime and economic performance, however, only in the case of non-industrialized countries. Additionally, the link was found to be more powerful for non-industrialized countries with long pegs (continuing for five or more years). In the case of *long-pegs*, announcement of fixed rates had an impact on inflation. However, for short-pegs (continuing for less than five years), this kind of announcement can have negative effect on real interest rates. Consequently, non-industrialized countries with both long and short pegs, were negatively linked to per capita output growth. Before-mentioned study of 154 countries covering post- Bretton woods era, found no significant link between exchange rate regime and economic performance for industrialized countries (Levy-Yeyati and Sturzenegger, 2001).

Jakob (2016) analyzed whether fixed exchange rate regime would have positive correlation to the GDP growth, using control variables: inflation rate, gross capital formation (% of GDP), index of government spending, index of human capital per person. Analysis was performed on 74 countries (36 developed and 38 developing countries) for the year of 2012. When all control

² Bosnia and Herzegovina, Romania, Serbia, Bulgaria, Latvia, Estonia, Poland, Slovakia, Czech Republic

variables are accounted for in the regression, exchange rates do not show any statistical significance. However, when index of government spending and human capital index is dropped, there is significant link, as fixed rates experienced 1.7% higher economic growth than those adopting more flexible rates.

3.2 Effect of currency regime and exchange rates on inflation

Prior research on effect of exchange rate regime on inflation level does not provide us with definitive conclusion in terms of which regime is better for economy. For example, in the study of 18 developing countries conducted by Little et.al (1993), in some countries fixed exchange rate regime caused lower levels of inflation, whereas in others exchange rate was found to be inadequate nominal anchor.

Following, study of Ghosh et.al (1996) which investigated cases of all IMF member countries during 1960-1990s, found that there is significant link between fixed exchange rates and low levels of inflation. Results are believed to originate from discipline effect, which means that political costs of withdrawing from the peg can lead to more stringent policies, and confidence effect which stipulates that confidence regarding inflation will increase motivation of holding domestic currency instead of holding foreign currency. Additionally, fixed rates were found to trigger higher investment, caused by high level of assurance in domestic currency from investors side. Thus, before-mentioned effects were found to lead to lower inflation under fixed rates. More specifically, economies with fixed rates experienced average annual inflation of 8 percent during observed period, compared to 14 percent in case of intermediate regimes and 16 percent in case of floating regimes. Despite the inflation benefit of fixed rates,

pegged regimes were also found to cause slower productivity growth compared to floating regimes.

Moreover, prior analysis of 153 countries during 1946-2001 performed by Rogoff et.al (2003) found no support to the existing idea that over time countries will move to extreme regimes like free float or hard peg. On the contrary, intermediate regimes showed to be quite durable. Study advocated that as economies get more sophisticated, value of exchange rate flexibility increases. For example, for countries that are on the early stage of economic development and integration, fixed or rather intermediate regimes seem to provide credibility, security against inflation or hyperinflation in some cases. For developing countries, with comparably low income, pegged exchange rates were found to be more beneficial in terms of lower inflation. However, highest rate of per capita income growth was observed in developing countries with floating rates. When economies develop, considerable benefits of moving to flexible exchange rates arise. Consequently, for developed economies floating regime is associated with lower inflation, in comparison to developed countries with fixed exchange rates. Nonetheless, highest rate of per capita income growth was observed in developed or high-income countries with fixed rates (Rogoff, Husain, Mody, Brooks, Oomes, 2003).

Empirical study conducted by Peters et.al (2001), found out that transition countries with intermediate arrangements could reduce inflation level, if they would adopted fixed regime instead. However, shifting from floating regime to intermediate, will not bring any significant decrease in inflation. Moreover, according to the research, if country's fundamentals make it inappropriate to adopt different regime, choice of floating regime will result in lower inflation. Countries adopting fixed exchange rate regimes were found to have higher current account deficits, in comparison to those selecting flexible or intermediate regimes. Moreover, countries following intermediate and fixed regimes, have higher ratios of reserves to base money than those with flexible regimes. Considering broad empirical research done, it is still impossible to postulate whether some particular regime is inferior to another.

3.3 Effect of currency regime and exchange rates on trade

Topic of exchange rate regimes was addressed and widely discussed by economist Milton Friedman as well. He was a strong proponent of flexible exchange rate regimes, M. Friedman believed that flexible exchange rate regime would boost conditions for international trade and the wealth created by the international division of labor (M. Friedman, 1953).

Exchange rates are widely believed to affect exports and imports. However overweighing empirical evidence from different countries around the world, the results turn out to be not so explicit. Moreover, some recent examples from currency devaluations in UK (2007-09) and Japan (2010-12) did not show any significant effect on exports.

It is important to mention that significant part of performed research was based on *de-jure* classification of exchange rate regimes, meaning the regime that country officially declared to International Monetary Fund to commit to. However, *de-facto* monetary policy action can differ, especially in developing countries with lack of transparency and efficient supervision in the market. The achieved results may therefore be subject to bias and errors. Qureshi and Tsangarides (2010) examined impact of exchange rate regimes on bilateral trade, differentiating between *de-facto* and *de-jure* arrangements. Policy credibility was found to have a crucial role in assuring effects of *de-jure* and *de-facto* regimes. Both *de jure* and *de facto* fixed rates were found to boost bilateral trade by low exchange rate volatility.

Some authors have also suggested that there is significant effect of fixed exchange rate on bilateral trade between main country and country that pegs to it. Moreover, for a country that pegs its currency to US dollar, fixed rates advance trade between other countries pegging their domestic currency to US dollar as well (Gantman, Dabos, 2017). Furthermore, research suggests that countries with fixed rates and few controls can increase trade by as much as

80%, in case if they choose less restrictive and permanent fixed rates, as opposed to hard pegs, such as currency unions. (Klein, Shambaugh, 2004).

Some evidence based on analysis of 48 countries during 2002-09, mentions that devaluation encourages service exports, while discouraging goods exports. Additionally, positive effect of devaluation was bigger for services exports rather than negative effect on goods exports (Mallick, 2010).

Exchange rate volatility was found to negatively affect export volume in Vietnam during 2000-14 (Thuy et. al, 2018). On the other hand, in Ukraine depreciation of national currency was found to cause increase export volumes and decrease in price of exported goods. Specifically, currency depreciation of 1 % led to 8.9% increase in export volumes and decline of 8.7 % in exported goods prices (Berezhnoi, 2014).

Empirical results are not so definitive as well as, part of the academia finds relationship between exchange rates and trade. Nonetheless, in China sudden exchange rate in China was found to affect exports. More precisely, currency appreciation led to decline in exports of 1.89% (Liu et.al, 2013).

3.4 Evidence from CIS countries

Following introduction of new currencies in 1992-1993 and attempting to stabilize them in the middle of the 1990s, CIS economies pegged their currency to US dollar. Type of arrangements were ranging from crawling bands to fixed-but adjustable baskets. However, most those arrangements fell in the crisis of 1998-99 (Dabrowski, 2013).

Taylor rule³ was found to clearly describe monetary policy performed by Central Bank of Russia during 2004-17 (Korhonen, Nuutilainen, 2017).

It was also found that for Georgia, exchange rate shocks had more clear effect on economy, than interest rate shock or foreign exchange intervention shock. Moreover, external shock of interest rates in USA had less powerful impact on Georgian economy, whereas domestic monetary policy shocks were found to significantly affect economy (Aslandi, 2007).

Numerous factors led to the depreciation of Russian ruble, like international sanctions, global appreciation of US dollar, capital flight and others. However, the initial and strong catalyst was the sharp decrease in oil prices (Haug et al 2012).

Furthermore, crude oil prices were found to illustrate the developments in value of US dollar against main currencies during 1970-2008. More precisely, boost in oil prices caused depreciation of US dollar against main oil exporter countries' currencies. For example, such as Russia, Mexico and etc. On the other hand, increase in oil price causes depreciation of local currencies against US dollar, if country is oil importer (Lizardo, Mollick, 2010).

Additionally, positive shocks in regard to oil prices happened to depress stock prices in emerging economies, as well as negatively impacting exchange rates in the short-run (Basher, et al 2012).

³ The Taylor Rule suggests that the Central Banks should raise interest rates when inflation is above target or when GDP growth is too high and above potential. Consequently, Central Banks should lower rates when inflation is below the target level or when GDP growth is too slow and below potential.

Apart from falling oil prices, international sanctions, capital flight are also believed to affect exchange rates drastically.

Crude oil prices and exchange rates were not found to be dependent in the period prior to crisis, however negative dependence was found between two in the period following the crisis (Reboredo, Rivera-Castro, 2013).

Urbanovsky (2015) studied factors that caused devaluation of Russian ruble in 2014. Results showed strong positive correlation between oil prices and ruble exchange rate, meaning that value of ruble reflects path of dollar. Even though domestic interest rates were increased, it did not bring expected foreign investment and inflow.

Exchange rate was found to be origin of the consumer and producer price index in Azerbaijan (Mukhtarov et.al. 2019). Position of exchange rates are crucial for Azerbaijani economy. The current account surplus that Azerbaijan was maintaining since the start of observed period (2007), was not sustained in 2015, resulting in 1,7 billion USD current account deficit Mukhtarov et.al (2019).

Currency devaluations or expansionary monetary policy result in higher inflation, without corresponding rise in economic growth (Goldstein, 2002).

3.5 Reasons for using exchange rate regime as policy instrument

Main reasons for countries to peg domestic currency to foreign currency or a basket of currencies is to provide macroeconomic stability and nominal anchor, as fixed rates are believed to promote bilateral trade (Klein, Shambaugh, 2004). On the other end, countries pegging their currency to foreign currencies also experience slower per capita output growth (Levy-Yeyati and Sturzenegger 2001).

Fixed and stable exchange rate of domestic currency provides domestic and foreign investors with confidence, which can facilitate capital inflow in the country. Especially, for developing countries with absence of efficiently functioning economic markets, fixed exchange rate can be good base when deciding whether to invest in the country or not.

Despite the fact that theoretical relationship between exchange rate regime and economy is uncertain, evidence presents a substantial link between the choice of the exchange rate regime and economic performance. Fixed exchange rate can promote lower inflation, but at the same time slower productivity growth as well (Ghosh et.al, 1997).

4 Analysis of selected countries

Following chapter will present chosen economic indicators and analyze exchange rates and currency regime effects on these indicators separately for each country. Based on academic and theoretical literature review, following assumptions were made:

- Exchange rates negatively affect exports in selected economies.
- Exchange rates positively affect imports in selected economies.
- Exchange rates positively affect GDP growth in selected economies.
- Exchange rates positively affect foreign direct investment in selected economies
- Exchange rates negatively affect inflation levels in selected economies.

To quantify the explanatory variable which is exchange rate- real effective exchange rate index (REER)⁴ is used. To monitor the developments, year-to-year change in real REER is calculated and used in the analysis.

Trade constitutes big part of every economy, therefore assumption is that trade is affected by changes in exchange rate. Theoretically, appreciation of domestic currency, can have negative impact on exports, as domestic goods become more expensive for foreigners. At the same time, it can increase imports, as foreign goods become cheaper for the citizens. The opposite happens when domestic currency depreciates, which stimulates exports (because of higher revenues) and discourages import of foreign goods, because of higher prices.

Next analyzed indicator is growth of gross domestic product (GDP). GDP is total market value of all goods and services produced during the year. GDP growth also referred to as economic growth, is important measure of domestic economy.

⁴ Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs (World Bank).

Inflation is another important indicator, which represents the general price level in economy. Moreover, this indicator is often used by Central Banks when performing monetary policy.

Last indicator which is analyzed is foreign direct investment (FDI). FDI refers to investments made to domestic economy by foreign companies or individuals. Usually, investment involves establishment of firm or purchase of domestic firms' assets. Foreign investors can acquire either full control over the business or at least influence to some extent in decision-making of the domestic company. FDI flows are presented on the net basis⁵ and can be analyzed in form of net inflows and net outflows. Net decline in assets or net raise in liabilities are noted as credits, whereas net raise in assets or net decline in liabilities are noted as debits. For developing countries, FDI inflows are very important, as they are main source of foreign financing.

Net outflows refer to value of outgoing direct investment which is made to foreign economies by residents of country. Net inflows refer to value of incoming direct investment to the domestic economy which is made by non-residents. Valued on net FDI inflow and outflow can be negative. Negative inflows would imply disinvestment⁶ by foreign investors in domestic economy was larger than recent investment. While negative net outflows imply that repatriated or disinvested direct investment from external economies is higher than investment made to foreign economies by domestic investors.

In the early 2000s, some of CIS nation (Azerbaijan, Georgia, Kazakhstan, Tajikistan, Uzbekistan, Armenia,) announced shifting to floating rates, but still de-facto pegging domestic currency to US dollar. Armenia, Georgia and Moldova attempted to implement managed floating in the beginning of 2000s. For the most economies in the region however, there is still

⁵ Capital transactions' credit minus debits between direct investors and their foreign affiliates.

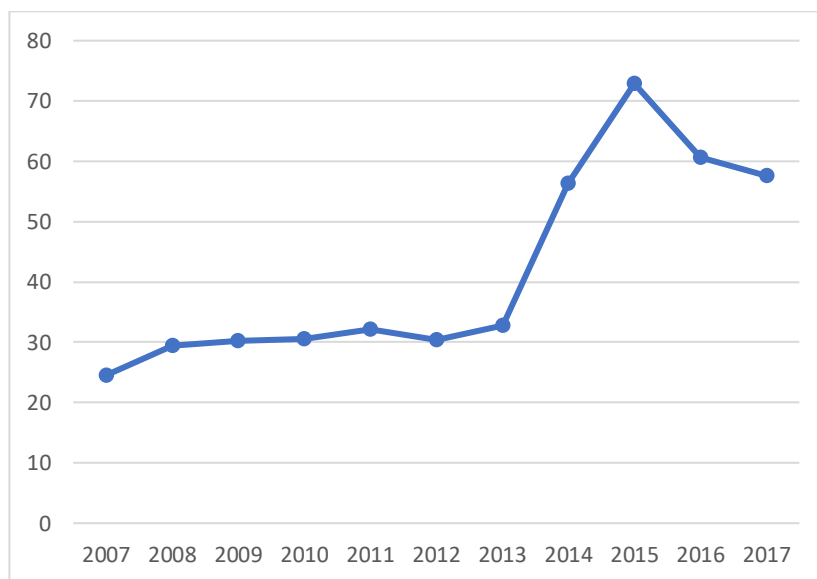
⁶ Refers to withdrawal or reduction of an investment made by foreign investors to domestic economy.

a fear to shift to free-floating regime, and so far, none of the CIS economies (except Russia) has shifted to free-float completely.

During 2007-17, all observed countries devaluated their currencies several times. Significant devaluations happened between 2014-2015, when all four economies experienced currency crisis and national monetary authorities had to devalue domestic currency. Russian ruble (RUB) decreased in value by more than 100 percent against US dollar, from 2013 to 2015. Kazakhstani tenge (KZT) decreased by 80% in value in 2014-15. Azerbaijani manat (AZN) was devaluated by 100% percent in 2014-16. Georgian lari (GEL) depreciated by 60 % in 2014-16. From comparing period between 2014-15, we can observe similar depreciations against US dollar during 2014-15 in all observed countries. This can be linked to global appreciation of dollar in 2014, when dollar rose against all major currencies. After 8 years of maintaining very low interest rates below 1%, expectation of Federal Reserve potentially increasing the federal funds rates, contributed to global demand for dollar, thus leading it to dollar's appreciation. However, for Russia, Kazakhstan and Azerbaijan another factor- sharp decrease in oil prices in that period affected currency exchange rates as well. With large share of oil exports before-mentioned countries were hurt significantly by drop in global oil prices.

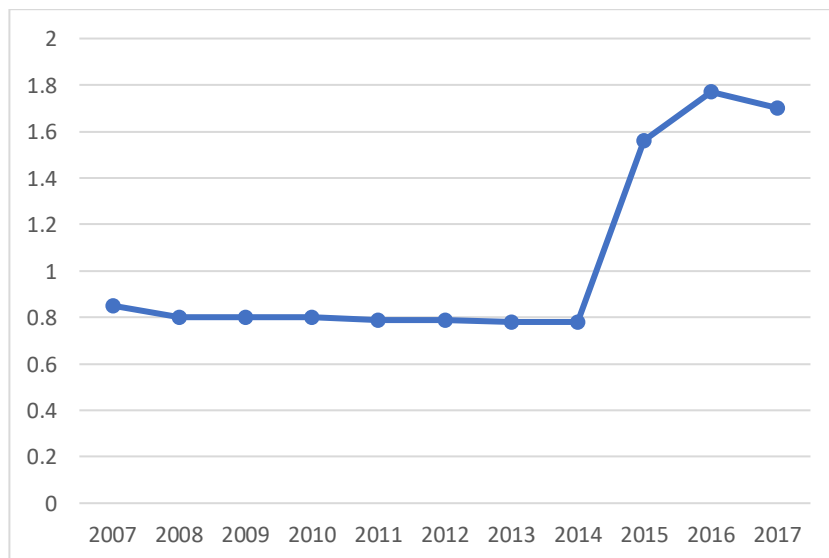
Following figures illustrate nominal exchange rate for the period of 2007-17 in selected countries.

Figure 1: Nominal exchange rate of Russian Ruble to US dollar



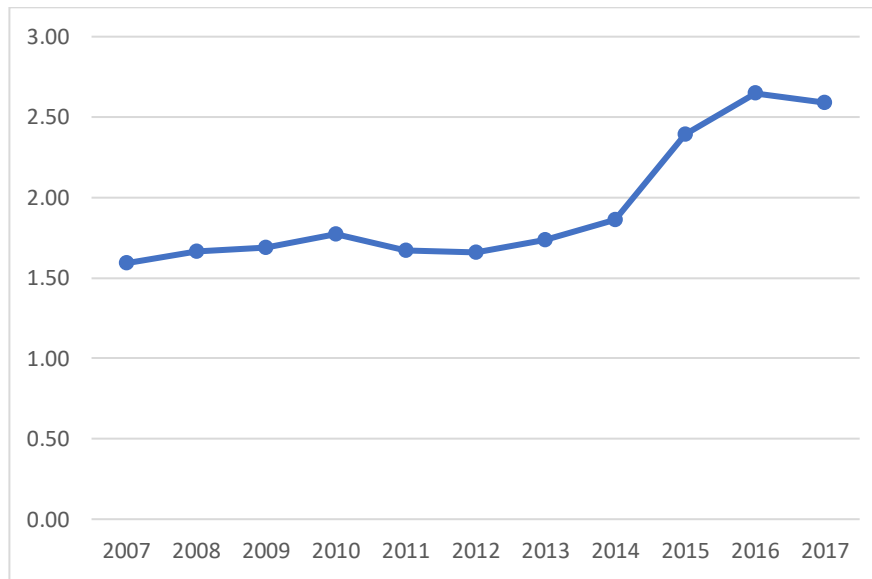
Source: International Monetary Fund

Figure 2: Nominal exchange rate of Azerbaijani Manat to US dollar



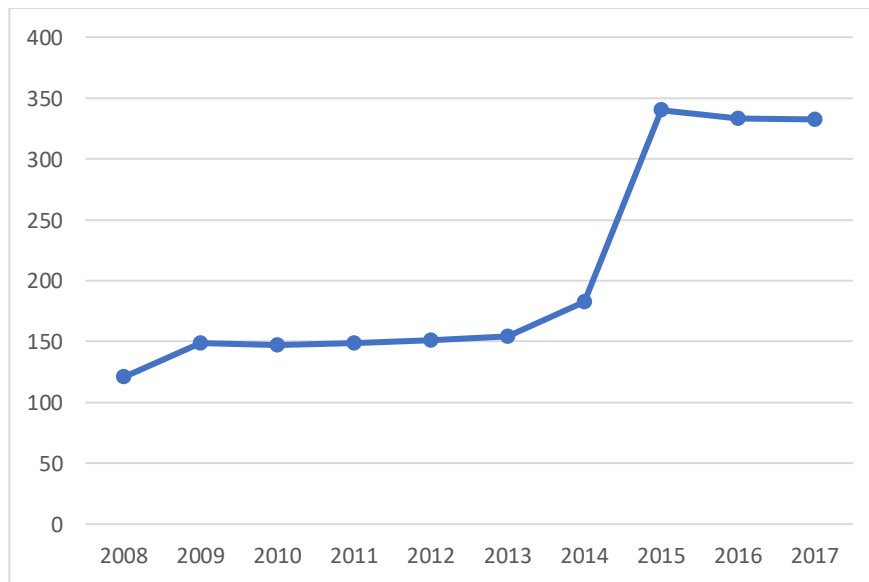
Source: International Monetary Fund

Figure 3: Nominal exchange rate of Georgian Lari to US dollar



Source: International Monetary Fund

Figure 4: Nominal exchange rate of Kazakhstan Tenge to US dollar



Source: International Monetary Fund

Devaluations usually can have positive and negative effects on the domestic economy. Devaluations most probably cause inflation to rise, because it makes every imported good or service more expensive for consumers. Businesses tend to cut on the cost and stay away from further investments, because of decrease in earnings. However, decline in the value of domestic currency can benefit export-oriented companies, and can motivate business activities. Following the devaluations, more flexible exchange rate arrangements were accepted by National Banks. Russia, Kazakhstan and Georgia let their currencies to float. Previous exchange rate anchor against US dollar were removed, and other monetary policy frameworks were adopted, such as inflation targeting (Russia, Georgia, Kazakhstan).

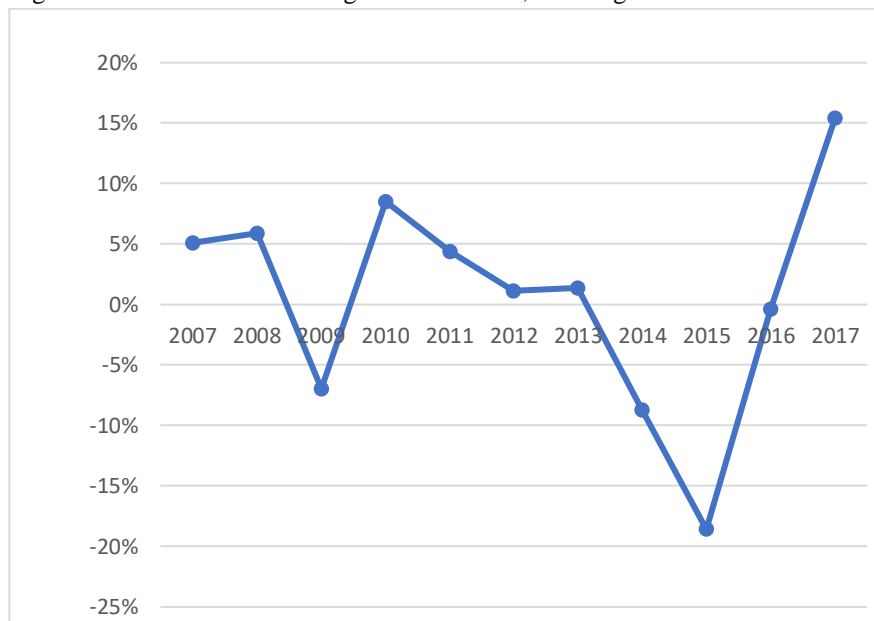
Overall, choice of either fixed or flexible exchange rate regime differs for developed and developing countries, as initially countries have different fundamentals and economic standing. Developing countries are often associated with absence of reliability, lack of transparency and narrow access to international markets and capital markets. In order to stabilize economy and maintain stable domestic currency, national monetary authorities of developing countries tend to opt for fixed exchange rate regime, usually in the form of soft peg against major foreign currency, such as US dollar or basket of foreign currencies. The main goal of the national monetary authorities or central banks is to provide internal and external stability of the national currency in the country.

In order to analyze the exchange rates and their impact on economy, effective exchange rate index was chosen to represent the position of the domestic currency. Nominal effective exchange rate index (NEER) refers to weighted average of bilateral nominal exchange rates of the domestic currency in terms of foreign currencies. It is calculated as weighted average change in nominal exchange rate of local currency to the basket of foreign country's currencies, which are main trade partners. The real effective exchange rate index (REER), is nominal effective exchange rate index adjusted for inflation.

Therefore, REER is able to capture inflation differentials in the country and in its main trade partners

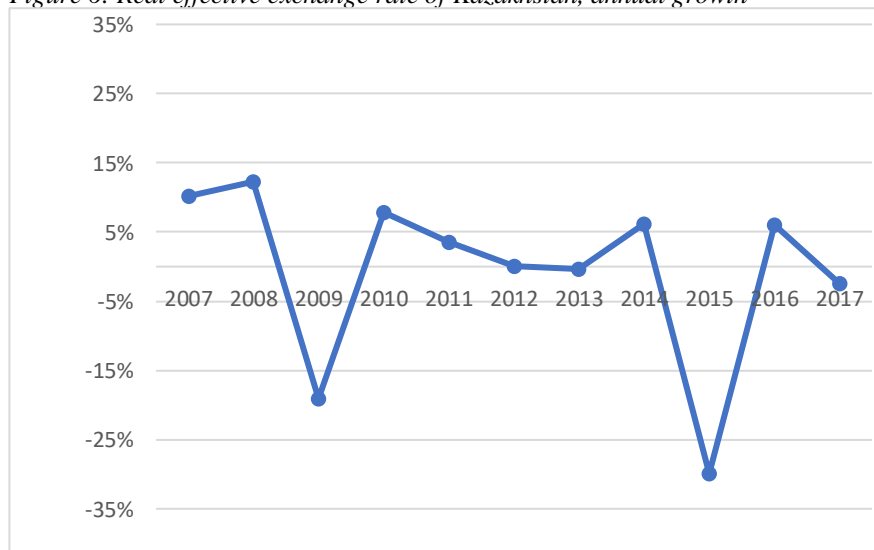
Following four figures illustrate real effective exchange rate index growth in Russia, Kazakhstan, Georgia and Azerbaijan.

Figure 5: Real effective exchange rate of Russia, annual growth



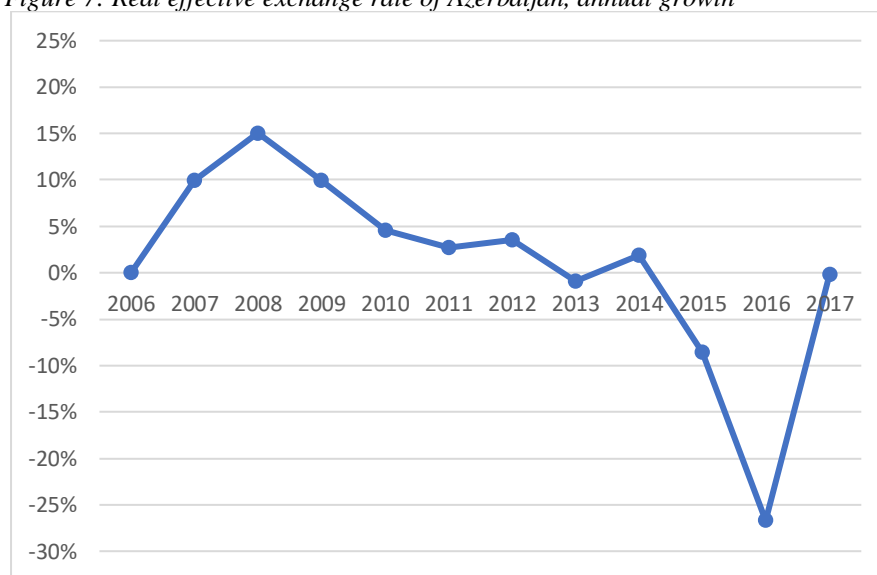
Source: World Bank

Figure 6: Real effective exchange rate of Kazakhstan, annual growth



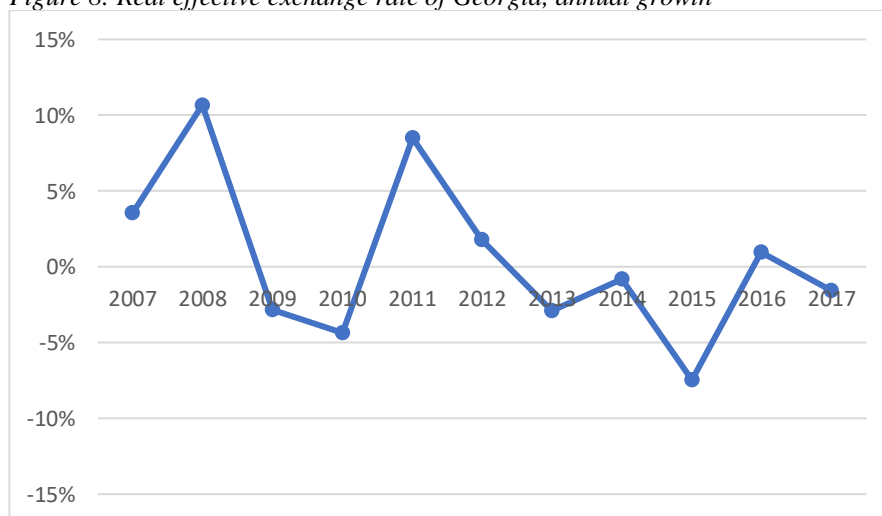
Source: World Bank

Figure 7: Real effective exchange rate of Azerbaijan, annual growth



Source: Islamic Development Bank

Figure 8: Real effective exchange rate of Georgia, annual growth



Source: World Bank

4.1 Russia

Russia, being one of the biggest emerging markets has relatively advanced financial markets. Due to relatively underdeveloped economic markets and unstable position of domestic currency, Central Bank of Russia was actively using monetary policy tools to maintain stability of exchange rate. During observed period, Russian ruble was de-facto anchored to US dollar, in some periods to composite of US dollar and euro. However, generally, from the beginning of the analyzed period, monetary authority planned gradual shift towards targeting inflation as a monetary policy tool. During period of 2007-14 exchange rate stability was mentioned as key target by Central Bank of Russia. Full shift to inflation targeting did not happen until beginning of 2015, following Russian currency crisis in 2013-2014.

Table 2: De-facto exchange rate arrangements of Russian Federation during 2007-17

<i>Year</i>	<i>Exchange rate arrangement</i>	<i>Monetary policy framework</i>
2007	Managed floating with no pre-determined exchange rate path	IMF-supported or other monetary program
2008	Other conventional pegged arrangement	Exchange rate anchor against composite of euro and US dollar
2009	Other managed arrangement	
2010		
2011		Other ⁷
2012		
2013		Other ⁸
2014		
2015	Floating	Inflation targeting
2016	Free-floating	
2017		

Source: (Annual Report on Exchange Rate Arrangement and Exchange Restrictions, IMF, 2007-17).

During observed period, Russian Federation was implementing mostly soft pegged or managed arrangement. Starting from 2009 up until 2015, de-jure exchange rate arrangement was classified as other managed arrangement, specifically controlled float. Initially, ruble was pegged to dual-currency basket of euro and US dollar, followed by absence of officially stated nominal anchor during 2011-2012. Overall, dual-currency basket was used as an operational benchmark by Central Bank of Russia while heavily intervening foreign exchange markets since 2005. Period of 2011-12 associated with Central Bank of Russia monitoring different indicators and aligning conducted monetary

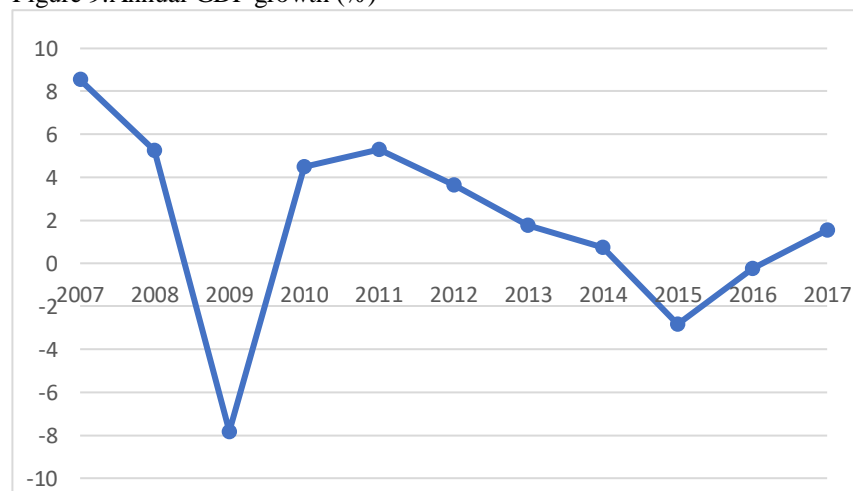
⁷ Russia did not have officially stated nominal anchor in that period. Central Bank of Russia monitored different indicators while conducting monetary policy (IMF,2011).

⁸ Central Bank of Russia took preparatory steps towards inflation targeting (IMF,2013).

policy accordingly. Later, in 2013-14, Central Bank started taking preliminary steps towards inflation targeting, which resulted in fully adopting inflation targeting framework in 2015. Following devaluation of Russian ruble in 2014, CB decided to switch to flexible exchange rate arrangement and let the Russian ruble float in the market. Starting from 2016 ruble was let to float freely. Table below summarizes evolution of exchange rate regimes in Russian Federation between 2007-17. Table below is a summary of currency regime implemented and nominal anchor used by Central Bank of Russia.

Sharp decrease in the value of ruble against US dollar, can be caused by several factors, oil prices being the main. With fuels accounting for on average to 60% of total exports, performance of Russian economy is volatile to oil prices. In the period of high and increasing oil prices, with high value of exports, domestic currency appreciates in value, local and foreign investors invest in local firms and currency. Increased economic activity also brings higher taxes to the government, enabling it to increase government expenditure. However, in the period of decreasing oil prices, which started in the 3rd quarter of 2014 and continued until January 2016, when it hit the minimum price of 29\$ per barrel, russian economy reflected this decrease in form of low dollar value of exports, and depreciation of ruble. Low revenues from oil in effect hurt most of the export -oriented companies. All this caused insecurity of local population as well as investors regarding the ruble.

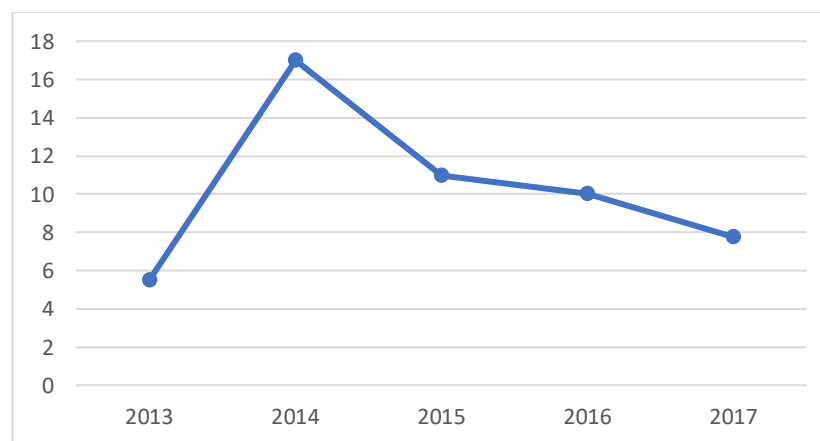
Figure 9: Annual GDP growth (%)



Source: World Bank

Russia was the world's sixth-largest economy in 2017 according to World Bank. During observed period, positive GDP growth is noticed, except for year of 2009, when negative growth rate of -7.82% was observed and years of 2015-16 with respective -2.8% and -0.2% GDP growth rate. Negative GDP growth during 2015-16, is partially caused by contraction in fuels industry due to decrease in value of total exports, which was caused by ruble 2nd devaluation of the ruble in the period, which resulted in exchange rate of 73 rubles per dollar at the end of 2015. For comparison, year -end exchange rate was 56.3 and 37.2 rubles per dollar in 2014 and 2013 respectively.

Figure 10: Central Bank policy rates, (%)



Source: International Monetary Fund

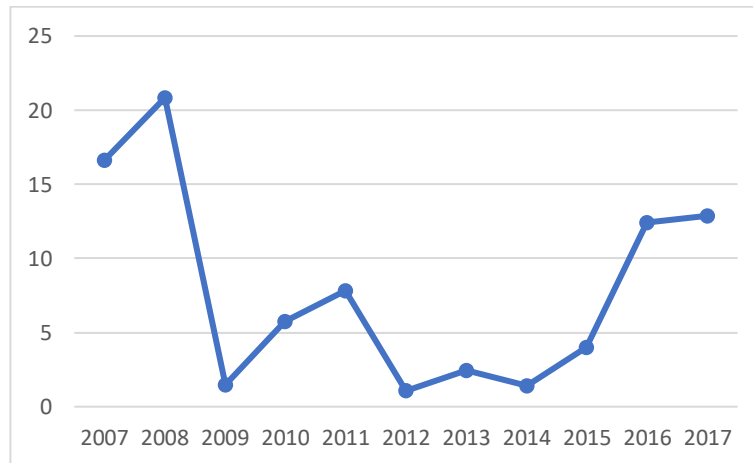
* Due to unavailability of public data on key rates of Central Bank of Russia, only period of 2013-17 is shown.

Stating November 2014, Russian ruble was let to fully float, and Central Bank cancelled dual-currency band consisting of euro and dollar. Regular foreign exchange interventions were also ended. In November of 2014, Central Bank increased interest rates from 9.5% to 10.5% and then to 17%⁹. This high interest rates did not happen since crisis of 1998 in Russia. During these was injections billions of USD to economy. Therefore, resulting from many large interventions, foreign currency reserves of Russia dropped by total of 100 billion

⁹ Central Bank interest rates for Russia are depicted for the period of 2013-17 only, due to the lack of data.

USD in 2015. However, followed with gradual stabilization of oil prices, ruble started to stabilize, which in turn caused increase in foreign currency reserves.

Figure 11: Inflation, measured by Consumer Price Index (CPI), (%)

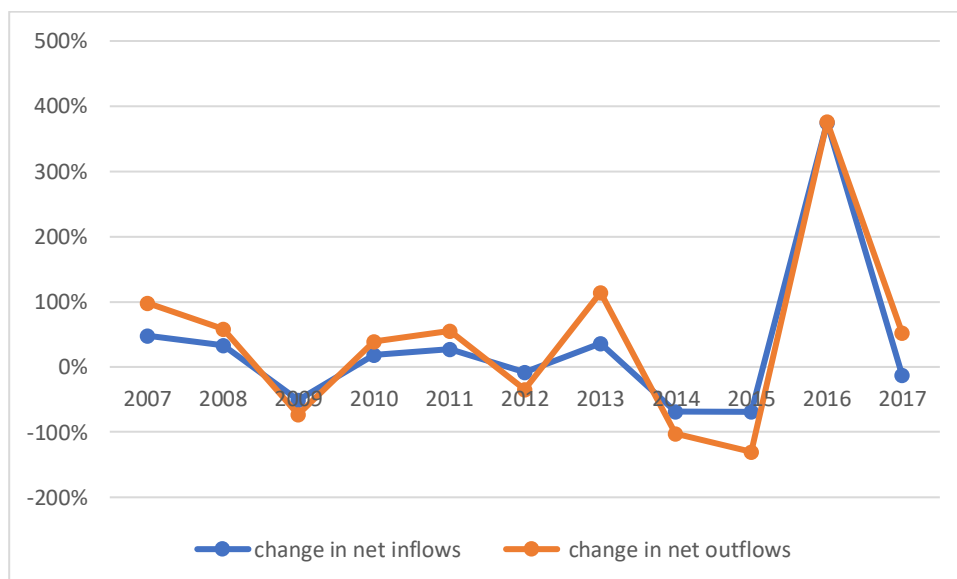


Source: World Bank

From the table above depicting inflation level in Russia over 2007-17, powerful trend of increase of inflation is observed during 2009-11, following the global financial crisis and in 2014-16, following currency crisis in the country.

Starting from 2014, there was also significant decrease in net inflows and outflows. However, the difference is bigger for net inflows (67%↓), whereas net outflows decreased by only 29%. Year of 2015 resulted in further decrease in net inflows (15%↓) and net outflows (35%↓). This period is considered with decrease in oil prices, depreciation of ruble, unstable political situation concerning Ukraine, imposed international sanctions. All these factors were leading to foreign investors to withdraw their existing investments or not to invest in their future. However, in 2016-17 the net outflows and inflows are reaching “the balance”, eliminating the large difference of previous years (2013-2015).

Figure 12: Annual change in Foreign Direct Investment, (%)



Source: World Bank

Russia actively participates in international trade. As paper assumes that exchange rates affect exports and imports, analysis of exports and imports structure is presented below. Main export partners of Russia are: China, Netherlands, Germany, Belarus, Turkey¹⁰. Over two-third (68%) of all exports are delivered to before-mentioned countries. and largest import partners are: China , Germany , Belarus , the United States and Italy.

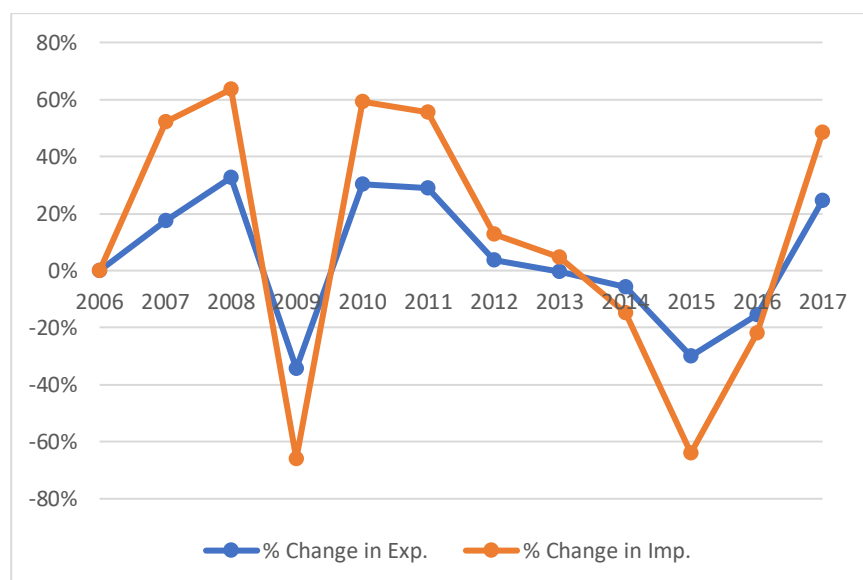
Top export product categories of Russia are: crude and refined petroleum, petroleum gas, LNG, coal briquettes, wheat, wheat and meslin¹¹. Country's largest export products during observed period were hydrocarbons, specifically oil and gas, as they account to two thirds of total exports. Top import product categories are: packaged medicaments, cars and vehicle parts, spacecrafts/planes/helicopters, compounds of precious metal or rare elements/radioactive elements. During all observed period Russia had trade surplus, meaning that value of exports exceeded value of imports. Although

¹⁰ Exports to China account to 12.5% of all Russian exports, 10% to Netherlands, 8% to Germany, 5% to Belarus and Turkey each. The rest of the trade partners are mentioned as "Unspecified" in the source from where data was derived from (which is WITS).

¹¹ Live trees and other plants, bulb, roots, cut flowers, ornamental foliage ("Harmonized Commodity Description and Coding Systems", United Nations International Trade Statistics).

always staying at positive level, Russia experienced decrease in trade balance following financial crisis, in 2009 (41% down) and following currency crisis, in 2015 and 2016, by 17% and 40% down respectively.

Figure 13: Total exports and imports, annual change, (%)



Source: World Bank

4.2 Kazakhstan

Kazakhstan can be characterized as large developing economy. It is the biggest Central Asian economy. Country's economy is largely based on fuels industry, with fuels amounting to two thirds of all export revenues. Considering under-developed financial markets and volatility of domestic currency, National Bank of Kazakhstan (NBK) used to peg domestic currency-tenge against US dollar. During studied, especially between 2009-15 NBK was performing heavy foreign exchange operations, in form of foreign currency injections to maintain stable and strong position of domestic currency and therefore, maintain fixed exchange rate regime. During almost all studied years (except 2007; 2016-17), NBK pegged domestic currency to US dollar. Table below summarizes currency regime implemented and nominal anchor National Bank of Kazakhstan during observed years.

Table 3: De-facto exchange rate arrangements of Kazakhstan, 2007-17

Year	Exchange rate arrangement	Monetary policy framework
2007	Managed floating with no pre-determined exchange rate path	IMF-supported or other monetary program
2008	Other conventional pegged arrangement	Exchange rate anchor against US dollar
2009	Pegged exchange rate within horizontal bands	
2010	Craw-like arrangement	
2011		
2012		
2013		
2014	Stabilized arrangement	
2015		
2016	Floating	Inflation targeting
2017		

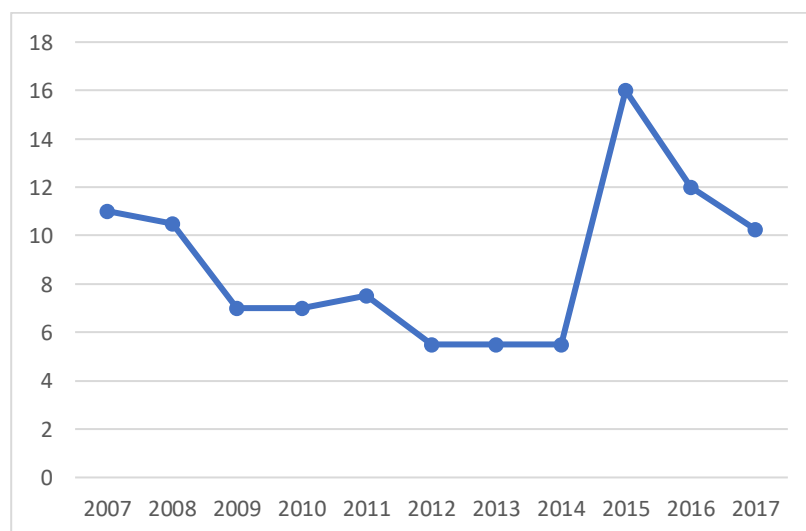
Source: (Annual Report on Exchange Rate Arrangement and Exchange Restrictions, IMF, 2007-17).

During analyzed 10 years, national currency of Kazakhstan-tenge, for the most part was de-facto pegged to US dollar. Overall, tenge was stable during 2007-13, excluding devaluation which happened in 2009. In the February of 2009, Kazakh tenge was devaluated by 18% by National Bank of Kazakhstan. Trading band of $\pm 3\%$ was settled vis-à-vis the US dollar. Consequently, classification of de facto exchange rate arrangement was replaced by pegged exchange rate with horizontal band, and later, in 2010 by crawling peg. Following years until 2013, stable position of tenge against US dollar can be observed. The stability of domestic currency against dollar was achieved not from real stability and strength of domestic currency but rather heavy interventions

¹² Central Bank of Kazakhstan started taking first steps towards inflation targeting framework (IMF, 2015).

by National Bank of Kazakhstan, which happened on monthly basis. For example, during 2014, NB injected over 10 billion of US dollars (National Bank of Kazakhstan). In February of 2014, domestic currency was devaluated against US dollar by 18%. Trading band of 1.05% against US dollar was established. Many factors may have contributed to the decision of devaluation of tenge. Decrease in oil prices, currency crisis in Russia (key trade partner of Kazakhstan) created pressure on domestic currency. However, NBK governors referred to the depreciation of tenge not as “devaluation”, but as a transition to a freely floating exchange rate when market forces determine appropriate exchange rate. De-facto exchange rate regime of crawl-like arrangement which lasted for 4 years was abandoned, and there was a shift to stabilized arrangement. In the same year, NBK started to take preparatory steps towards abandoning exchange rate anchor against US dollar and using inflation targeting instead for maintaining price stability. Following devaluations of tenge, National Bank of Kazakhstan decided to let tenge float, by implementing floating exchange rate arrangement. Exchange rates against main trading partner currencies (Russia firstly), oil prices act as main factors in fluctuation of tenge (National Bank of Kazakhstan).

Figure 14: Central Bank policy rate, (%)



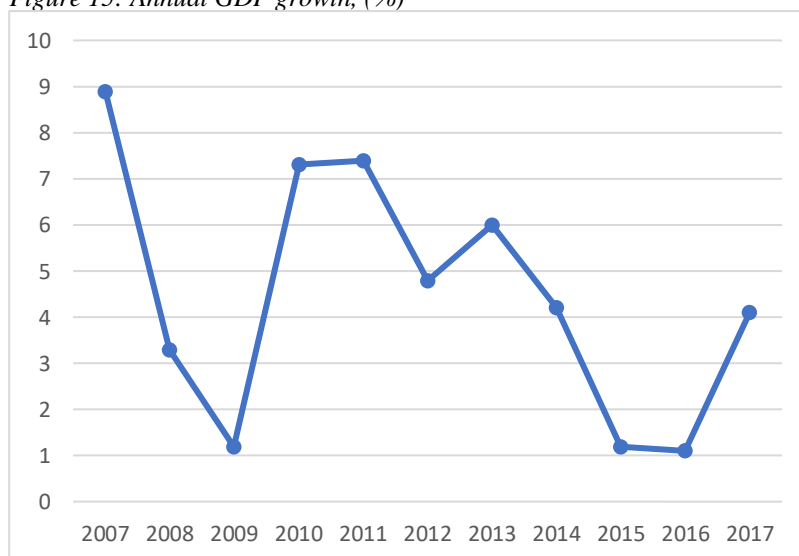
Source: National Bank of Kazakhstan

Following huge decrease in value of tenge, NBK raised interest rates which it was maintaining mostly stable interest rates over the observed period. Excluding 2007-08, all

period until currency crisis of 2014, NBK interest rate was fluctuating approximately between 5 % and 8%. As a response to high level of inflation, following devaluation of tenge, NBK raised interest rates from 5.5% to 16%. The rates were further decreased to 12% and to 10.25% in 2016 and 2017 respectively.

Over the 10-year period, Kazakhstan experiences positive GDP growth with pick growth happening between 2009-11. From 2014 to 2015, however GDP growth rate declined from approximately 6% to 1.2%. This time corresponds to currency crisis and shift to floating exchange rate arrangement in Kazakhstan. Starting from 2016, due to gradual stabilization of economy growth rate increased to 4.1%.

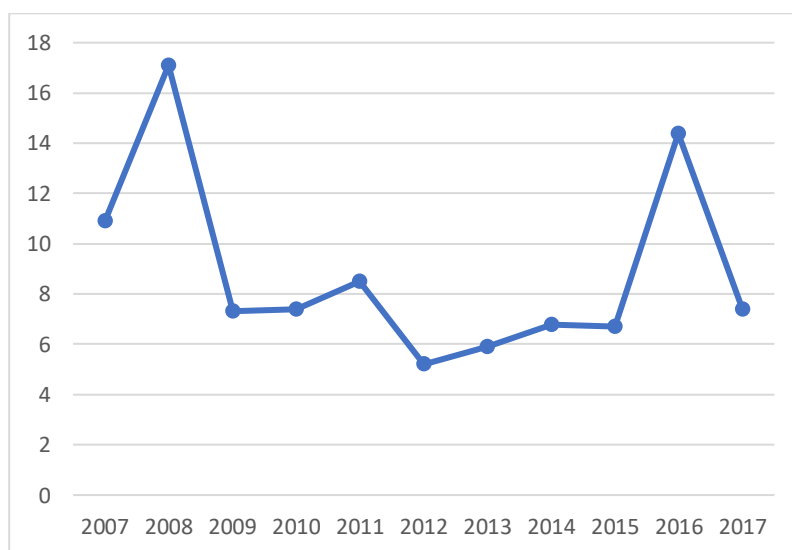
Figure 15: Annual GDP growth, (%)



Source: World Bank

National Bank also pledged to publicly disclose target inflation every year as well as actual level of inflation. Target inflation rate set by National Bank of Kazakhstan is band 6-8% annually. The annual inflation decreased from 16.6% in September to 8.5% in December of 2016, being slightly above the National Bank's target of 6-8% band.

Figure 16: Inflation, measure as Consumer Price Index (CPI), (%)



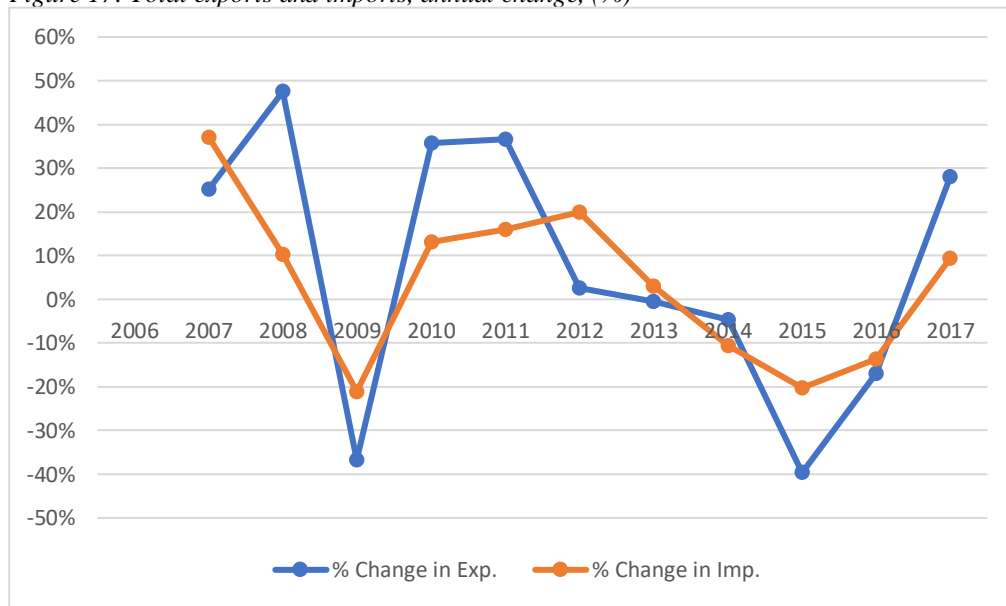
Source: World Bank

Kazakhstan experienced positive trade balance during observed period. On average about two-thirds (68%) of Kazakhstan exports by value were delivered to European countries while around 31% shipped sold to Asian countries. The rest accounted to Americas and Australia. Biggest export partners of Kazakhstan are: Russian Federation, China, Germany, United States and Italy¹³. Largest import partners are: Italy, China, Netherlands, Russian Federation, and Switzerland¹⁴. Largest export product categories are: Mineral fuels including oil (70.1% of total exports), iron and steel (6.8%), copper (4.2%), inorganic chemicals (3.5%). Main import products are: consumer goods, intermediate goods, machinery, metals, and fuels.

¹³ Exports to Russian Federation accounts to 40% of all exports, to China 15%, to Germany 5%, to USA 4.3% and 3.2% to Italy.

¹⁴ Imports by Kazakhstan from Italy accounts to 18% of all exports, 12% from China, 7% from Switzerland, 10 % from Netherlands and Russia each.

Figure 17: Total exports and imports, annual change, (%)

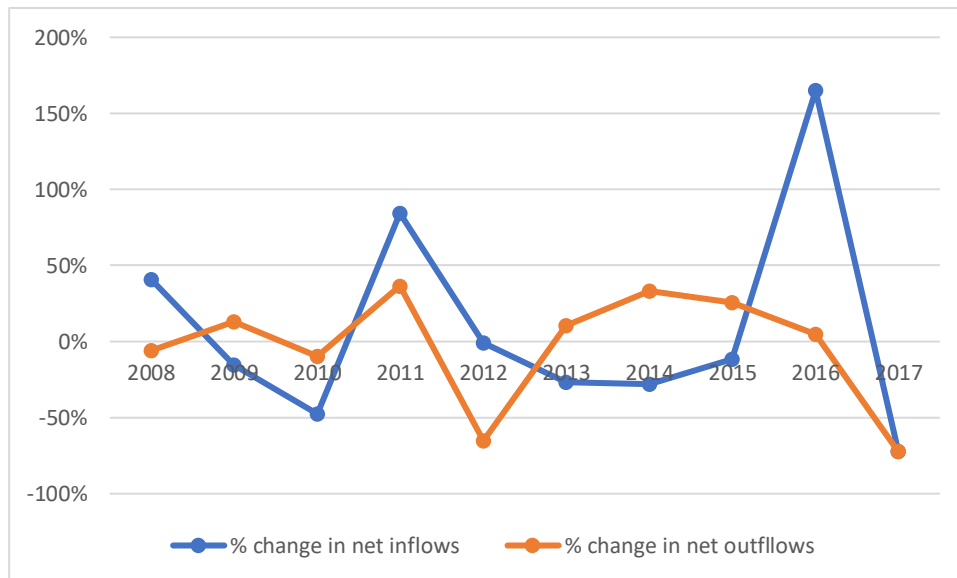


Source: World Bank

It is believed that devaluation of domestic currency can expand economic output by motivating local businesses to expand their operations and produce for export. Due to lower value of national currency, it is beneficial for domestic firms to trade internationally, specifically to sell to foreign countries in foreign currency. However, following the crisis of tenge experienced in 2014-15, exports and imports of Kazakhstan also experienced decrease in value. Value of exports decreased by 40% in 2015 and further by 17% in 2016.

This decrease may be caused by devaluation of tenge against US dollar in corresponding period. Decrease in value of imports is also noticed. Value of total imports decreased for three consecutive years from 2014 to 2016 (10%, 20% and 14% respectively). However, this decrease can be consequence of economy experiencing recession, with uncertainty from investors and population side regarding domestic currency, and negative prospects regarding financial stability, thus decreased aggregate demand. Moreover, export volume decreased as well during discussed years. Because oil constitutes major part of export product of the country, decrease in price discourages local producers to sell more. Starting from 2017 Kazakhstan exports and imports increased by 28% and 9% respectively.

Figure 18: Annual change in FDI, (%)



Source: Worl Bank

Overall since gaining independence, Kazakhstan has attracted large amounts of foreign direct investment (FDI), especially due to huge hydrocarbon reserves. FDI was found to positively affect economy of Kazakhstan, specifically GDP growth and per-capita income (Jepbarova et.al, 2011). Biggest part of foreign direct investment is directed to energy sectors. Looking at the industries where most of the foreign investments were made, we can observe that these are mining and manufacturing industries. Geological explorations accounted for primary FDI.

4.3 Azerbaijan

Azerbaijan is relatively small, developing economy mainly dependent of export of hydrocarbons, specifically oil and natural gas. Due to heavy oil dependency, economy of Azerbaijan is volatile to change in oil prices. In order to provide price stability and exchange rate stability Central Bank of Azerbaijan used to peg national currency- manat to US dollar. Sharp decrease in oil prices starting from 2014,

significantly and negatively affected domestic economy. Due to decreased revenues from oil, which caused foreign currency income, and high level of dollarization there was huge pressure on national currency. As Monetary policy implemented by Central Bank of Azerbaijan (CBAR) mainly focused on exchange rate stability, in situation of high pressure CB had to take actions to maintain exchange within stable limits. Because of underdeveloped debt market in the country, CB was constrained in the usage of monetary policy tools and foreign exchange interventions were used as a policy tool. Central Bank was intervening foreign exchange markets by injecting foreign currency to domestic economy using currency reserves. For example foreign currency sterilizations that were held by CBAR during 2011-2015 amount to total of 16 billion US dollars. With almost half of the interventions happening in 2015.

Azerbaijani manat was devaluated by 34% in February and by further 48% in December of 2015. REER also declined by 9% and 27% in 2015 and 2016 respectively. In 2015, peg of domestic currency to US dollar was abandoned (which was effective since 2011) and peg against currency basket comprising US dollar and euro was accepted. Following that, in 2016 exchange rate regime was reclassified to managed floating from stabilized arrangement. However, according to IMF de-facto exchange rate arrangement is classified as other managed arrangement. Previously de-facto nominal anchor against US dollar was abandoned and state chose not to have officially stated nominal anchor. Central Bank of Azerbaijan rather audits various indicators and align its monetary policy with them. Nonetheless, according to IMF, *de-facto* nominal anchor used by CB of Azerbaijan is still US dollar. Starting from 2016, CB reduced number of interventions. Currency sales of 4.9 billion US dollar were realized by State Oil Fund of Azerbaijan in 2016 (Monetary Policy Review of CBAR, 2016). In the same year, for the first time, foreign exchange auctions were introduced by Central Bank, and 114 auctions were organized that year. Additionally all foreign exchange rate bureaus were closed due to inadequately high demand for foreign currency by population, which was also caused by psychological effect of devaluation and loss in creditworthiness of domestic currency. Following table presents currency regimes exercised by Central Bank of Azerbaijan during 2007-17.

Table 4: De-facto exchange rate arrangements on Azerbaijan, 2007-17

Year	Exchange rate arrangement	Monetary policy framework
2007	Crawling peg	Exchange rate anchor
2008		Exchange rate anchor against composite of euro and dollar
2009	Stabilized arrangement	Exchange rate anchor against US dollar
2010		
2011		Other ¹⁵
2012		
2013		
2014		
2015		
2016	Other managed arrangement ¹⁶	Other ¹⁷
2017		

Source: (Annual Report on Exchange Rate Arrangement and Exchange Restrictions, IMF, 2007-17).

Devaluation of domestic currency effect exports in terms of making domestic goods cheaper for foreigners. However, devaluation makes foreign goods more expensive, thus discouraging imports. Both effects can be viewed as positive, domestic firms can benefit from favorable export conditions. At the same time, because of more expensive imports, domestic firms will try to substitute imports by producing the products

¹⁵ De-facto exchange rate anchor to US dollar was maintained (IMF, 2015)

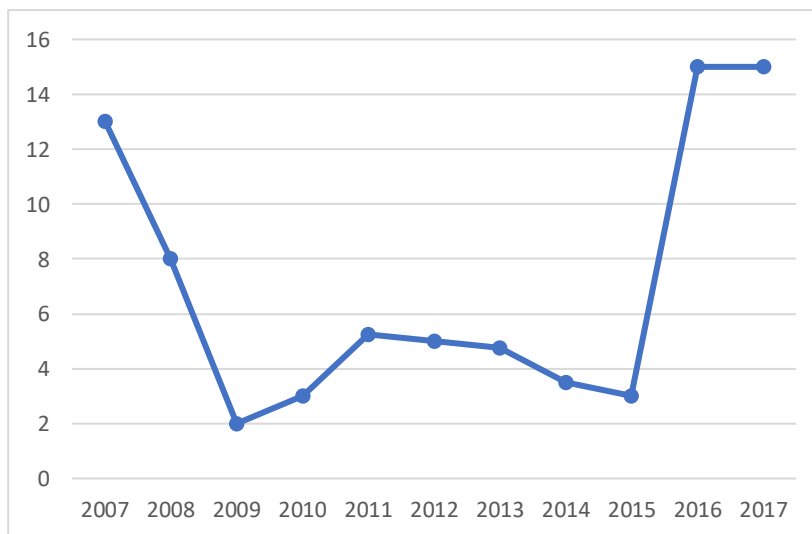
¹⁶ De-jure exchange rate regime of Azerbaijan during 2016-17 is managed floating arrangement. However, for the purpose of transparency in the paper, de-facto exchange rate regime as defined by IMF was taken into account.

¹⁷ Azerbaijan did not have officially stated nominal anchor, Central Bank was monitoring different indicators while conducting monetary policy.

internally. This will cause import substitution and can decrease country's import dependency.

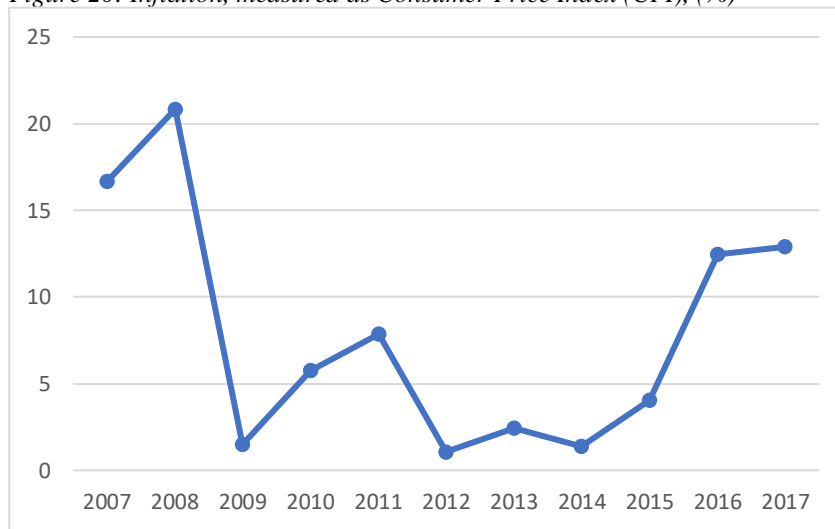
As in the case of Russia and Kazakhstan, CB of Azerbaijan, after devaluation of local currency, increased interest rates from 3% to 15% in 2016. One of the reasons of increasing CB policy rates was to pressure inflation downward through interest rates channel, which amounted to 15% in 2016 in comparison to 2% in 2014. downward through interest rates channel. When CB raises interest rates which at that moment increased already by 10% since 2014.

Figure 19: Central Bank policy rates, (%)



Source: International Monetary Fund

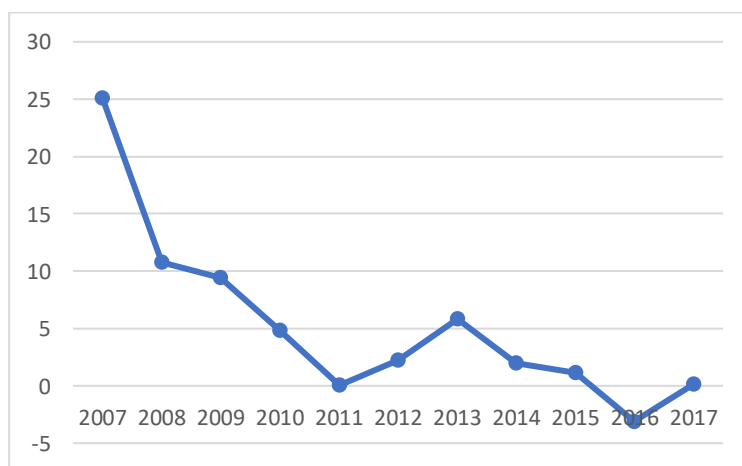
Figure 20: Inflation, measured as Consumer Price Index (CPI), (%)



Source: World Bank

Inflation, measured by Consumer Price Index (CPI), was at record high level of 21% (during studies 10 years) in 2008. Gradually, inflation was brought down, and fluctuated between 2 and 8% during 2009-15. After depreciation of manat in 2015, inflation increased from 4% to 12% in 2016.

Figure 21: Annual GDP growth, (%)



Source: World Bank

Fast increase in oil production resulted in GDP growth surge from 2006, equaling to 25% growth. However, in the coming years, GDP growth to approximately

10% annually. During 2011-12 due to relatively lower oil production, annual GDP growth fell to 0.1% and 2.2% (2012) respectively. In later years, GDP was growing on average between 2 and 6% until 2016, when for the first time during observed period negative growth was noted.

Fuel exports¹⁸ accounted on average to 92% of total exports during observed 10 years. This also makes Azerbaijan the country with lowest level of export diversification among other selected countries. Export diversification can be detrimental in international trade of the country. Poorly diversified export product groups can end up in all finance and human capital concentrating only in one industry. Although it can create increased skills and virtue by means of specialization and concentration, it does not provide country with efficient export mechanism. Therefore, economy becomes volatile to price changes associated with main export product group.

Main export partners of Azerbaijan are: Russian Federation, Turkey, China, United States, and Ukraine¹⁹. Whereas, main import partners are: Italy, Turkey, Israel, Russian Federation²⁰. Constituting 90% of total exports, mineral fuels including oil are the biggest export products of Azerbaijan. Other products such as fruit and vegetables, gems and precious metals constitute around 1% of total exports, leaving rest to aluminum, plastic, organic chemicals, cotton and other industries. Main import product groups are: vehicles, oil products, wheat, packaged medicaments and broadcasting equipment.

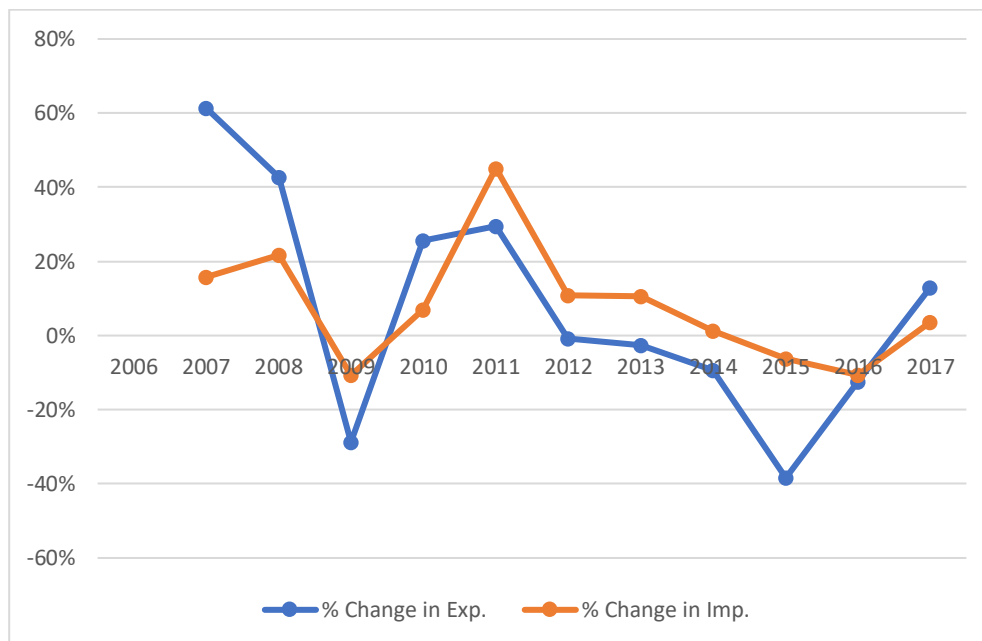
Value of Azerbaijani exports decreased (29% down from previous year) following global financial crisis and sharp decline of oil prices in 2009. Significant decrease in value of exports however happened in 2015- 38% down, followed by 12% decrease in 2016. Starting from 2017, growth in value of exports was observed, which is assumed to result of gradual increase in global oil prices. Decrease in imports during 2015-16 may be explained by higher prices for imported goods than previously, as well as declined consumption by households and enterprises.

¹⁸ Mentioned “fuel exports” include gas exports as well. However

¹⁹ Russian Federation-17%, Turkey-15%, United States- 5.5%

²⁰ Italy-32%, Turkey 10%, Russian Federation- 4.2%

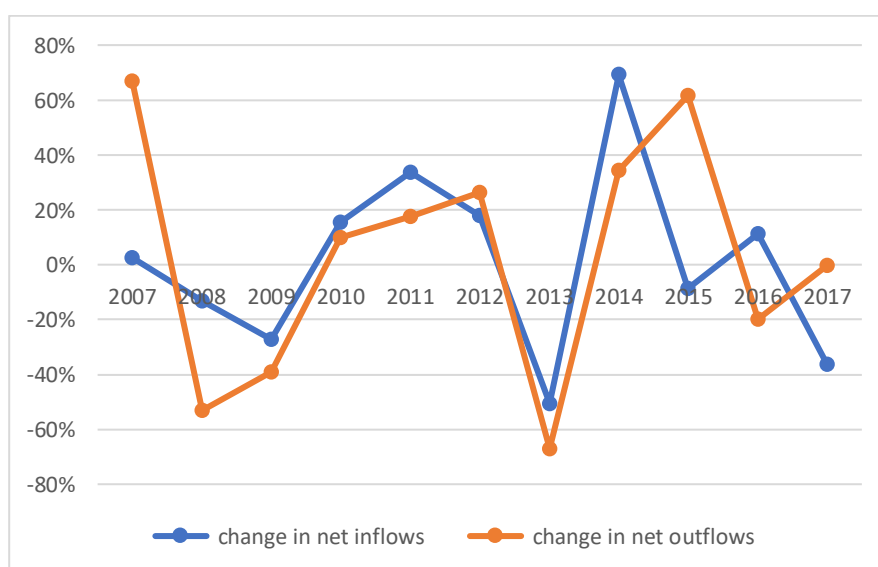
Figure 22: Total exports and imports, annual change, (%)



Source: World Bank

Azerbaijan received large amounts of foreign investments since the independence. However, as in the case of Kazakhstan, most of investments flow to the energy sector.

Figure 23: Foreign direct investment, annual change, (%)



Source: World Bank

4.4 Georgia

Georgia was one of CIS countries that decided to adopt independent floating regimes. During the period of 2000-2004, National Bank of Georgia was not intervening to the exchange rate market to defend Georgian lari (GEL). However, monetary authority was intervening into the market occasionally to achieve its inflation objectives. However, in 2005, country moved to managed floating regime with no pre-announced path for the exchange rate. During 2005-08, National Bank of Georgia was intervening foreign exchange market in order to stabilize exchange rate fluctuations and enhance national reserves. In the span of a year during 2008-2009, national monetary authority shifted to using monetary aggregate as nominal anchor. Table below presents currency regimes of Georgia during 2007-17.

Table 5: De-facto exchange rate arrangement of Georgia, 2007-17

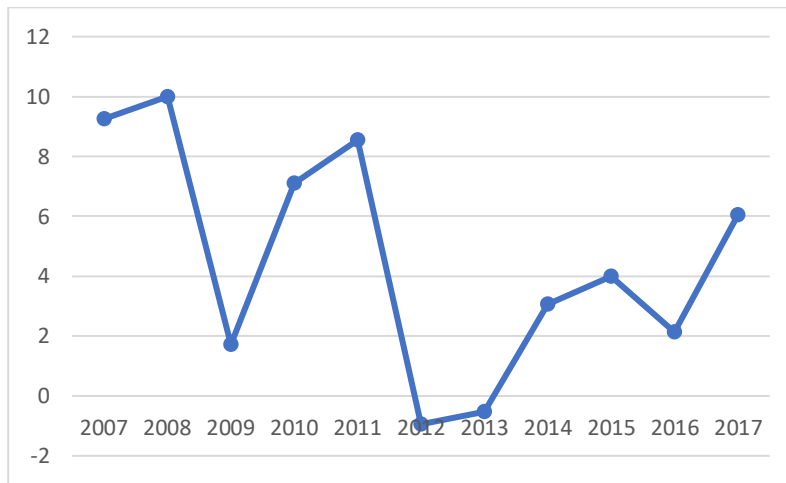
Year	Exchange rate arrangement	Monetary policy framework
2007	Managed floating with no pre-determined exchange rate path	IMF-supported or other monetary program
2008		Monetary aggregate target
2009	Other managed arrangement ²¹	Exchange rate anchor against dollar
2010		Inflation targeting
2011	Floating	
2012		
2013	Stabilized arrangement	
2014	Floating	
2015		
2016		
2017		

Source: (Annual Report on Exchange Rate Arrangement and Exchange Restrictions, IMF, 2007-17).

Starting from 2010, National Bank of Georgia started using inflation targeting as a part of monetary policy. Main goal was to maintain low and stable inflation, thus encouraging sustainable economic growth, low interest rates and declining unemployment. Inflation targets of 5%, 4% and 3% were set respectively for 2016, 2017 and 2018. Long term CPI inflation target was set to 3% (National Bank of Georgia, 2016).

²¹ De-jure exchange rate regime during mentioned was floating regime.

Figure 24: Inflation, measured as Consumer Price Index (CPI)

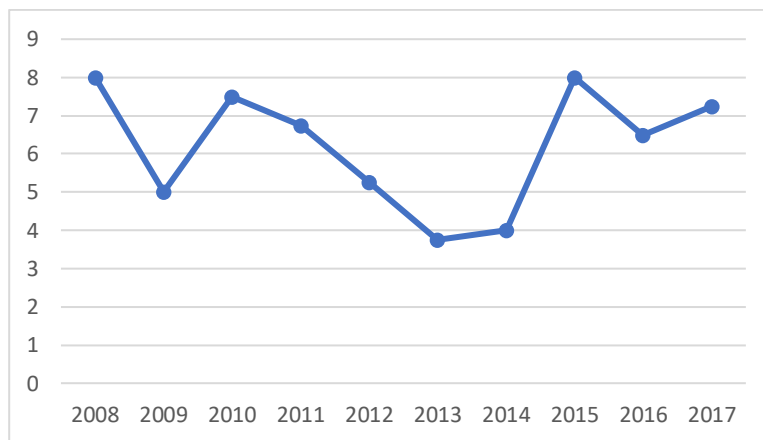


Source: World Bank

Refinancing rate²² is used as a main monetary tool. The difference between target and actual inflation can be a good indicator how much policy should be adjusted, meaning increasing or decreasing refinancing rate. Change in the refinancing rate is transmitted to domestic economy via channel of exchange rates, market rates and influencing aggregate demand. National Bank of Georgia for 10 years, did not increase or decrease interest rates significantly, except 2010 and 2015. Key rates were raised from 4% to 8% in 2015.

²² Interest rate at which commercial bank can borrow fund from National Bank for overnight or short-term borrowings.

Figure 25: Central Bank policy rates, (%)

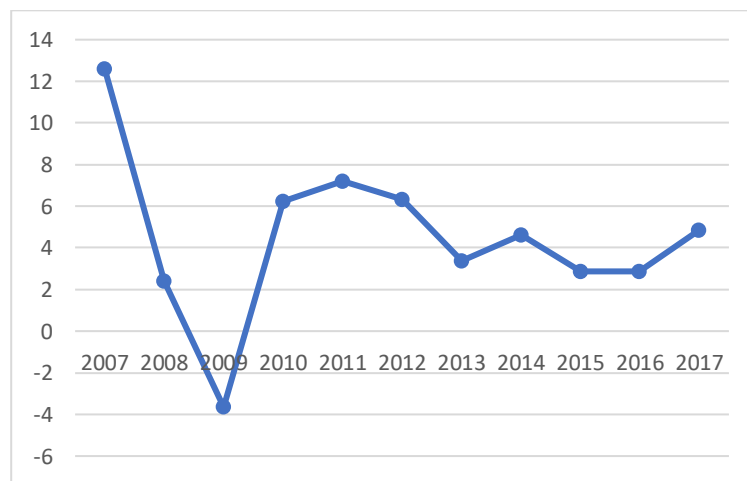


Source: World Bank

Starting from March 2013, previously practiced multiple currency practice in Georgia was amended. Until November 2014, Georgian lari was quite stable against US dollar. During next three months, lari depreciated by 10% and continued depreciating until September of 2015, ending with total 29% depreciation against US dollar. National Bank of Georgia kept interventions in order to smooth exchange rate at minimum. As found by Mzhavandze and Saha (2016), Georgian economy was affected by the exchange rates through major channels such as foreign direct investment, trade and remittances. Economic downturn and the extreme currency devaluation happening in Azerbaijan and Kazakhstan – main trading partners of Georgia – also negatively affected Georgian economy.

From comparing period between 2014-15, we can observe similar depreciations against US dollar during 2014-15 in all observed countries. This can be linked to global appreciation of dollar in 2014, when dollar rose against all major currencies. After 8 years of maintaining very low interest rates below 1%, expectation of Federal Reserve potentially increasing the fed rates, contributed to global demand for dollar, thus leading it to appreciate.

Figure 26: GDP growth rate, annual, (%)

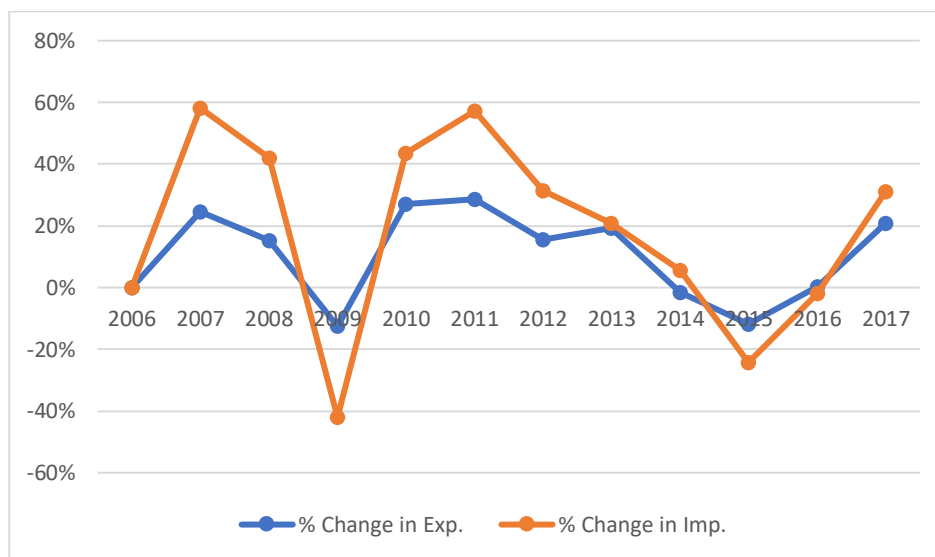


Source: World Bank

GDP of Georgia experienced negative growth in the years of global financial crisis. In later years however, growth was achieved again, with several decreases in 2013 and 2015.

Trade balance of Georgia is different from other observed countries, as country experienced trade deficit, meaning value of imports was exceeding value of exports. Georgia also, achieved diversification in its exports. Consumer goods, raw materials and metals constitute approximately 20-30% each of total exports. Major trade partners of Georgia are: Turkey, China, Azerbaijan, Armenia, Ukraine and EU countries. Major export products are copper and ferroalloys, cars, wine and medicaments. Whereas imported products are refined petroleum, cars, packaged medicaments, natural gas, automobiles. During the global appreciation of dollar and consequent depreciation of Georgian lari value of exports and imports decreased (by 2% in 2014 and 12% in 2015), however it was not so drastic as in the case of other three countries: Russia, Kazakhstan and Azerbaijan. Partially decrease in exports and imports is also caused by unstable and volatile economic standing in main trade partners of Georgia, which are Russia and Azerbaijan. Azerbaijan being main country of oil and gas imports.

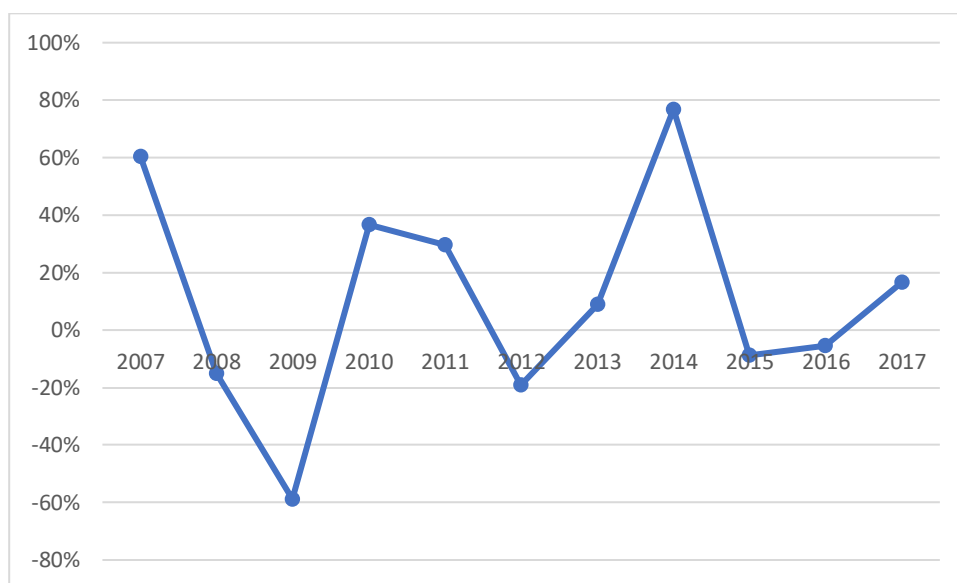
Figure 27: Total exports and imports, annual change, (%)



Source: World Bank

Analysis of FDI and its structure is important for Georgia as Georgian economy is largely dependent on FDI and it is believed that FDI amounting to more than one billion US dollars a year is needed in order to maintain economic growth of over 5% (Kapanadze, 2014). Since the independence of Georgia, biggest investors were: Azerbaijan and United Kingdom, followed by Netherlands, Luxembourg and Turkey. First two countries' investments were mainly into the oil and gas pipelines, which connected Azeri main export product-oil and gas to Turkey and further to Europe. Additionally, according to GeoStat (National Statistics Office of Georgia) – majority of investments were made in transportation and communication sectors. Transportation sector mainly includes pipeline transportation used for fuels. Agricultural sector however had the lowest share in total FDI's during 2007-17.

Figure 28: Foreign direct investment, net inflows, annual change, (%)



Source: World Bank

Over the observed period, Georgia had on average 1,4 billion USD of foreign direct investment net inflows and they grew on average by 11% annually. Decrease in net inflows was realized following global financial crisis, 15% and 59% decrease in 2008 and 2009 respectively. This decline may be explained by global financial crisis and more importantly the political tensions between Georgia and Russia regarding the territories of South Ossetia and Abkhazia²³. Political instability caused by this can have negative effect on decisions of foreigners whether to invest in the country or not. Moreover, part of existing foreign investments can be subject to withdrawals of investments by foreigners. Starting from 2010, change in FDI shows positive growth, reaching highest amount of net inflows in 2014 and in 2017 roughly 1,8 billion US dollars, which accounted to 12% of GDP. Later, from 2010, there was stable growth in FDI net inflows (excluding 2012). In 2015-16, net inflows declined slightly (by 9 and 5%). Instability in the economies of investors origin contributed to this issue.

Moreover, it is important to note negative net outflows in in 2006 and 2009, which means Georgian residents' repatriated or disinvested their investments from

²³ Five days war was in August of 2008 between Russia and Georgia

external economies more, than new investment to foreign economies made by residents. In comparison to other observed countries, Georgia has lowest direct investment outflow during selected period, never amounting for half billion USD on average.

5 Econometric Model, Empirical Results and Discussion

In order to test initial assumptions made in the beginning of the study linear regression method was implemented. Real effective exchange rate was considered as independent variable, whereas GDP, inflation, exports& imports and foreign direct investment were considered as dependent variables. To quantify the independent variable which is exchange rate- real effective exchange rate index (REER) is used. To monitor the developments, year-to-year change in real REER is calculated and used in the analysis.

Two dummy or factor variables were included in the regression model. First factor is sanctions levied on Russia by USA and European Union in 2014. Because analyzed economies are closely related and, in some cases, interdependent on each other's economies, sanctions are assumed to have affect in all countries, except Georgia. Second chosen dummy is currency exchange regime practiced by countries. The 2 levels of this dummy variable are: fixed rates (initial currency arrangement in all countries) and floating rates (all countries shifted to floating rates at some point). Linear regression model was run using statistical software R. Because of small sample size, significance or alpha level of 10% was chosen.

$$H_0: p \leq 0.1$$

$$H_1: p > 0.1$$

The null hypothesis states that there is no change in dependent variable associated with independent variable, which is real effective exchange rate.

The alternative hypothesis states that there is a change in dependent variable associated with independent variable.

The main econometric model used is based on the following relationship:

$$\hat{y}_t = \alpha + \beta * x_t + \gamma * z_t + \varepsilon_t$$

Following chapter will introduce obtained empirical results together with interpretation. Therefore, chapter is divided to 5 sub-sections, each section presenting results of the empirical model for each indicator separately.

5.1 Exports and Exchange Rates

To establish relationship between exchange rates and exports the linear regression model was run. Considered dependent variable is export, whereas independent variable is exchange rate. In order to consider the effect of change in exchange rate arrangement, independent two-level dummy variable-currency regime was added in the cases for all countries. The assumption behind is that currency regime affect economy and could affect analyzed indicators. Considering the fact that during analyzed period, at some point all countries shifted from fixed currency arrangement to floating arrangement, it is expected that selected economic indicators would reflect the change. The two levels of categorical variable were defined as “fixed regime” and “floating regime”. Based on the existing literature, expectation is that shift from pegged to floating arrangement will be followed by increase in exports and decrease in imports. Therefore, floating currency regime is supposed to have positive effect on exports, and negative effect in imports.

Second two-level categorical variable- sanctions were included in the model of all countries while analyzing the exports. In order to remove the trend from data and make it stationary, percentage change from year-to year was used in quantifying inputs for real effective exchange rate and exports.

Estimated model equation is presented below:

$$Exports_{t,j} = \alpha + \beta_1 * REER_{t,j} + \beta_2 * Sanctions_{t,j} + \gamma * Currency\ regime_{t,j} + \varepsilon_{t,j}$$

According to the obtained results, approximately 63% of variation in the exports of Russia are associated and can be explained by change in exchange rate, imposed sanctions and currency regime. 1 percentage point increase in real effective exchange rate is associated with approximately 2.2 percentage points increase in exports, adjusted for sanctions and currency regime. This implies positive relationship between real effective exchange rate and exports in Russia, whereas initial assumption was that

relationship would be negative. Contrary to the expectations, shift to floating currency arrangement negatively affected exports. This may be explained by the fact that major export product of Russia is – crude oil, which experienced dramatic decrease in price in 2014. Shift to floating currency arrangement corresponds to the following year-2015. Surprisingly sanctions were not found to have negative impact, as expected.

The obtained p-value of the test is equal to 0.01734. As p-value is less than significance level ($\alpha=10\%$ or 0.1) we can reject the null hypothesis (that there is no effect of exchange rates to exports) and accept alternative hypothesis. To conclude in the case of Russia exchange rates have statistically significant effect on exports.

In the cases of Georgia, like Azerbaijan, test resulted in p-value higher than established significance level, therefore we fail to reject the null hypothesis. Moreover, the obtained r-square of such a low value, is an indicator that data did not fit the model properly.

In the case of Kazakhstan relationship between exchange rates and exports was found. Exchange rates were found to have positive effect on exports, as 1 percentage point increase in real effective exchange rate is associated with 1.59 percentage point increase in exports. Floating currency arrangement also had positive impact on exports. However, sanctions imposed on Russia had negative impact on exports. Overall, around 49% of variations in the exports are associated with exchange rate, sanction and currency regime. With p-value less than established alpha, null hypothesis can be rejected and it can be said that exchange rates in Kazakhstan do effect exports.

Table below summarized the results of the test for all four countries.

Table 6: Relationship between exchange rates and exports

Coefficients				
Russia				
	Estimate	St.Error	t-value	p
REER	2.20543	0.05714	4.084	0.0046
Currency regime	-0.17713	0.17318	-1.023	0.34046
Sanctions	0.08312	0.54002	0.496	0.6353
p-value: 0.0173	R.sq: 0.745	Adj. R.sq: 0.636		
Kazakhstan				
REER	1.5990	0.5889	2.715	0.030
Currency regime	0.0586	0.2311	0.254	0.807
Sanctions	-0.15665	0.1920	-0.816	0.442
p-value: 0.0580	R.sq: 0.6346	Adj.R.sq: 0.4779		
Azerbaijan				
REER	1.4246	1.1298	1.261	0.2488
Currency regime	0.38520	0.2958	1.302	0.234
Sanctions	-0.2808	0.2450	-1.146	0.289
p-value: 0.233	R.sq: 0.4369	Adj.R.sq: 0.1956		
Georgia				
REER	0.8289	0.9243	1.636	0.146
Currency regime	0.0696	0.1111	0.627	0.551
Sanctions	-0.1537	0.11899	-1.292	0.237
p-value: 0.3415	R.sq: 0.3615	Adj.R.sq: 0.0878		

5.2 Imports and Exchange rates

To establish relationship between exchange rates and imports dependent variable imports and independent variable of real effective exchange rate were considered. Similar to the analysis of exports, two dummy variables were integrated in the models. However, sanctions imposed on Russia were not included in regression model for Georgia. The main rationale behind is that relatively low amount of Georgia's imports is associated with Russia, therefore it is assumed that sanctions would not affect Georgian economy significantly. In the case for other three countries, sanctions were included in the model. Moreover, year-to-year change in both numeric variables (real effective exchange rate index and imports) were considered. Estimated regression equation is presented below:

$$Imports_{t,j} = \alpha + \beta_1 * REER_{t,j} + \beta_2 * Sanctions_{t,j} + \gamma * Currency\ regime_{t,j} + \varepsilon_{t,j}$$

In the case of Russia, exchange rates were found to have positive impact on imports, as initially assumed. 1 percentage point increase in exchange rates or appreciation of domestic currency by 1 percentage point leads to approximately 2.26 percentage point increase in imports. Whereas, shift to floating currency regime negatively affected imports. Surprisingly sanctions again, as in the case for exports had very small, although positive impact on imports. Estimated regression equation is presented below:

In Georgia, similar situation was observed and positive relationship between exchange rates and imports was established. 1 percentage point increase or appreciation of domestic currency by 1 percentage point, was found to increase imports by 2.39 percentage points. Shift to floating currency regime, however has negative but almost insignificant effect on imports. Following is estimated model for Georgia:

For both Kazakhstan and Azerbaijan, however, effect of exchange rates on imports was not found to be statistically significant, therefore we cannot say stipulate

that exchange rates affect imports in Azerbaijan and Kazakhstan. Estimate econometric models for Azerbaijan and Kazakhstan are presented below:

Table 7: Relationship between exchange rates and imports

Coefficients				
Russia				
	Estimate	St.Error	t-value	p
REER	2.2677	0.4847	4.678	0.00227
Currency regime	-0.1311	0.15546	-0.856	0.42021
Sanctions	0.0209	0.15057	0.139	0.89313
p-value: 0.007235	R.sq: 0.8033	Adj.R.sq: 0.719		
Kazakhstan				
REER	0.7284	0.3951	1.844	0.108
Currency regime	0.03351	0.1550	0.216	0.835
Sanctions	-0.16425	0.12886	-1.275	0.243
p-value: 0.1042	R.sq: 0.563	Adj.R.sq: 0.3758		
Azerbaijan				
REER	0.2419	0.6653	0.364	0.727
Currency regime	0.01458	0.01458	0.084	0.936
Sanctions	-0.1450	0.14428	-1.005	0.348
p-value: 0.4336	R.sq: 0.3074	Adj.R.sq: 0.0105		
Georgia				
REER	2.3978	0.9025	2.657	0.0289
Currency regime	-0.000981	0.09701	-0.010	0.9922
p-value: 0.0743	R.sq: 0.4778	Adj.R.sq: 0.3473		

5.3 Inflation and Exchange rates

In the analysis of relationship between exchange rates and inflation, inflation measure as the Consumer Price Index (CPI) was considered as dependent variable. One of dummy variables (sanctions) was used only in the case for Russia and Kazakhstan, because of high exposure of Kazakh economy to Russian economy. Moreover, inflation levels of previous period were included to the model as independent variable.

In the model for Kazakhstan, Georgia and Azerbaijan in testing for effect on inflation, sanctions imposed on Russia are not considered as categorical or dummy variable. Assumption is that response in both dependent and independent variables to the sanctions is very low. However, contrary to the initial assumption, test failed to establish statistically significant relationship between exchange rates and inflation in all countries. Obtained p-values were significantly higher than established significance level. Therefore, we fail to reject the null hypothesis.

Estimated regression models are presented below:

$$Inflation_{t,j} = \alpha + \beta_1 * Inflation_{t-1,j} + \beta_2 * Sanctions_{t,j} + \gamma * Currency\ regime_{t,j} + \varepsilon_{t,j}$$

Table 8: Relationship between exchange rates and inflation

Coefficients				
Russia				
	Estimate	St.Error	t-value	p
REER	-0.296848	0.126433	-2.348	0.0572
Inflation(t-1)	0.002173	0.345753	0.006	0.9952
Currency regime	0.031463	0.042206	0.745	0.4842
Sanctions	-0.044155	0.040329	-1.095	0.3156
p-value: 0.3317	R.sq: 0.4873	Adj.R.sq: 0.1455		
Kazakhstan				
REER	0.14590	0.09680	1.507	0.1755
Inflation(t-1)	0.16847	0.34232	0.492	0.6377
Currency regime	0.01747	0.03028	0.577	0.5820
p-value: 0.4486	R.sq: 0.2992	Adj.R.sq: -0.00119		
Azerbaijan				
REER	0.35860	0.36945	0.971	0.364
Inflation(t-1)	-0.01451	0.47528	-0.031	0.977
Currency regime	0.12215	0.08690	1.406	0.203
p-value: 0.4287	R.sq: 0.3102	Adj.R.sq: 0.01452		
Georgia				
REER	0.38678	0.27812	1.391	0.207
Inflation(t-1)	0.02533	0.39793	0.064	0.951
Currency regime	0.00549	0.02895	0.190	0.855
p-value: 0.4741	R.sq: 0.2854	Adj.R.sq: -0.0208		

5.4 Foreign Direct Investment and Exchange rates

To find effect on foreign direct investment, year-to-year change in net FDI flows was considered. Sanctions were considered as factor variable only for Russia. For other three countries, considering very low level of foreign direct investment inflows and outflows related to Russia, only currency regime was used as a factor variable.

Regression tests run for establishing relationship between foreign direct investment and exchange rates were statistically non-significant in case of all countries. Obtained negative r-squared indicates non-significance of independent variables: exchange rates, currency regime and sanctions.

Below is estimated equation:

$$FDI_{t,j} = \alpha + \beta_1 * REER_{t,j} + \beta_2 * Sanctions_{t,j} + \gamma * Currency\ regime_{t,j} + \epsilon_{t,j}$$

Table 9: Relationship between exchange rates and foreign direct investment

Coefficients				
Russia				
	Estimate	St.Error	t-value	p
REER	2.099	14.167	0.148	0.886
Currency regime	-2.531	4.543	-0.557	0.595
Sanctions	2.904	4.401	0.660	0.530
p-value: 0.9272	R.sq: 0.05994	Adj.R.sq: 0.3429		
Kazakhstan				
REER	2.3798	2.8435	0.837	0.427
Currency regime	1.1943	0.90781	1.316	0.225
p-value: 0.3185	R.sq: 0.2487	Adj.R.sq: 0.0609		
Azerbaijan				
REER	-0.03767	0.0531	-0.708	0.499
Currency regime	-0.0094	0.0147	-0.645	0.537
p-value: 0.7167	R.sq: 0.0657	Adj.R.sq:-0.1678		
Georgia				
REER	1.0595	2.1155	0.501	0.630
Currency regime	0.2389	0.2274	1.051	0.324
p-value: 0.5715	R.sq: 0.1305	Adj.R.sq: -0.0868		

5.5 GDP and Exchange rates

For analysis of GDP and exchange rates, exchange rates together with previous period GDP growth was considered as independent variables. For Russia, Kazakhstan and Georgia results turned out to be statistically non-significant, therefore, we cannot claim existence of positive relationship between exchange rates and GDP in these countries.

Only in case of Azerbaijan, real effective exchange rate was found to have positive although very small impact on GDP. More precisely, 1 percentage point increase in exchange rate was found to generate 0.076 percentage points increase in GDP, with 75% of variations in GDP is caused by variations in exchange rates. This supports the initial assumption regarding positive relationship between exchange rates and GDP. Additionally, shift to floating exchange rate arrangement had small, but positive impact on GDP, whereas sanctions had negative effect.

Estimated econometric model is presented below:

$$GDP_{t,j} = \alpha + \beta_1 * GDP_{t-1,j} + \beta_2 * Sanctions_{t,j} + \gamma * Currency\ regime_{t,j} + \varepsilon_{t,j}$$

Table 10: Relationship between exchange rates and GDP

Coefficients				
Russia				
	Estimate	St.Error	t-value	p
REER	0.3079	0.1589	1.937	0.101
GDP(t-1)	0.13107	0.3131	0.419	0.690
Currency regime	-0.0317	0.0502	-0.632	0.550
Sanctions	0.0152	0.0494	0.308	0.769
p-value: 0.3614	R.sq: 0.4684	Adj.R.sq: 0.1139		
Kazakhstan				
REER	0.1097	0.07258	1.512	0.182
GDP(t-1)	0.02089	0.3256	0.064	0.9510
Currency regime	-0.0151	0.03085	-0.492	0.6400
Sanctions	-0.0130	0.0212	-0.613	0.5624
p-value: 0.2733	R.sq: 0.5269	Adj.R.sq: 0.2115		
Azerbaijan				
REER	0.076152	0.17111	0.445	0.6718
GDP(t-1)	0.5517	0.1314	4.199	0.0056
Currency regime	0.0042	0.0414	0.102	0.9217
Sanctions	-0.0132	0.0346	-0.381	0.7164
p-value: 0.0111	R.sq: 0.8539	Adj.R.sq: 0.7565		
Georgia				
REER	0.2120	0.3718	0.570	0.586
GDP(t-1)	0.0123	0.4694	0.026	0.980
Currency regime	0.0062	0.0290	0.214	0.837
p-value: 0.8769	R.sq: 0.0875	Adj.R.sq: -0.303		

6 Conclusion

Initial assumption was that exchange rates negatively affect exports and inflation, whereas positively affect imports, GDP growth and foreign direct investment. However, obtained statistical results did confirm all the initial assumptions.

The empirical tests only partially confirmed the assumptions made in the beginning. For example, relationship between exchange rates and exports was expected to be negative, as appreciation of domestic currency against weighted average of currencies of main trading partners, would imply that domestic products and services will be more expensive for foreign consumers, therefore, they will consume less, and exports will decline. On the contrary, positive relationship between exchange rates and exports was established for Russia and Kazakhstan. More precisely, in Russia, one percentage point increase in real effective exchange rate was found to bring 2.2 percentage point increase in exports, adjusted for sanctions and currency regime. The similar result was found for Kazakhstan, where 1 percentage point increase in real effective exchange rate was found to bring 1.59 percentage point increase in exports, adjusted for sanctions and currency regime. Moreover, shift to floating arrangement, had a negative impact on exports in Russia, but positive effect in Kazakhstan. However, for Georgia and Azerbaijan, statistically significant relationship between exchange rates and exports was not found.

The initial hypothesis of positive relationship between real effective exchange rate and imports was also partially supported by the empirical test. For Russia and Georgia, positive relationship was determined. 1 percentage point increase in exchange rate caused 2.26 percentage points increase in imports in Russia, and 2.39 percentage point in Georgia. Appreciation of domestic currency, makes foreign goods cheaper for local population and therefore households and firms tend to consume more of foreign goods, contributing to the increase in imports. Shift to floating regime had negative impact on import as it was anticipated. For Azerbaijan and Kazakhstan, we cannot claim any relationship between exchange rates and imports.

Empirical results did not support initial assumptions regarding positive relationship between exchange rates and foreign direct investment in any selected economy.

The assumption of positive relationship between exchange rates and GDP was statistically proved only in the case of Azerbaijan. However, the effect was very small, meaning, 1 percentage point increase in exchange rate was found to generate 0.076 percentage points increase in GDP. Additionally, shift to floating exchange rate arrangement had small, but positive impact on GDP, whereas sanctions had negative effect.

For the rest countries, no significant relationship between real effective exchange rate and GDP was established.

The following study aimed to contribute to the existing gap in the literature on the CIS countries. The research targets economies of countries which are not widely studied and analyzed in the academic literature (except for Russia). The study summarizes and analyzes main economic factors during observed 10 years and impact of currency regime, as well as exchange rates to economy.

The insignificance of empirical results may be caused by some factors, one of which is relatively small sample size, covering only 10 periods. The currency regime changes for Azerbaijan and Kazakhstan happened in 2016, and in 2015 in Russia. Consequently, only 2 periods after the change was included in the model. Unfortunately, available data for required indicators was only covering years until 2017. The results could be different if more periods following the currency regime change were included in the model. Moreover, more distinctive outcome could be potentially reached, if quarterly or monthly data was used in the model, in contrast to annual data.

7 Bibliography

- Amato J., Filardo A., Galati G., Peter G., Zhu F. (2005). Research on exchange rates and monetary policy: an overview. Bank for International Settlements Working Paper no.178
- Anderson H., Habermeier K., Kokenyne A., Veyrune R. (2009). Revised system for the classification of exchange rate arrangements. International Monetary Fund Working Paper
- Aslandi O.(2007). The optimal monetary policy and the channels of monetary transmission mechanism in CIS-7 countries: The case of Georgia. Charles University, Center for Economic research and Graduate Education, Discussion Paper No.2007-171
- Barguellil A., Bel-Salha. O., Zmami M. (2018). Exchange rate volatility and economic growth. Journal of Economic Integration. Vol 33. No.2
- Basher S., Haug A., Sadorsky P. (2012). Oil prices, exchange rates and emerging stock markets. Energy Economics, vol.34, p. 22-40
- Berezhnoi I. (2014). Exchange rate risk and export flows: firm level evidence from Ukraine. Kyiv School of Economics
- Burke.J.J. (2009). The effects of devaluation of the tenge upon Kazakhstan economy
- Center for Economic and Social Development. (2016). National currency rate in Azerbaijan: is the stability sustainable?
- Central Bank of Azerbaijan (2014). Report on Monetary Policy Review
- Central Bank of Azerbaijan (2015). Report on Monetary Policy Review
- Central Bank of Azerbaijan (2016). Report on Monetary Policy Review
- Central Bank of the Russian Federation. (2015). Monetary policy in Russia: Recent challenges and changes
- Chang. K.L. (2014). The symmetrical and positive relationship between crude oil and nominal exchange rate returns. North American Journal of Economics and Finance 20 (2014), p. 266-284
- Dabrowski M. (2013). Monetary policy regimes in CIS economies and their ability to provide price and financial stability. Bank of Finland, BOFIT

- De Vita G., Kyaw K.S. (2011). Does the choice of exchange rate regime affect the economic growth of developing countries? *The Journal of Developing Areas*, Vol. 45 (Fall 2011), p.135-153
- Dellas H., Tavlas G.S. (2017). Milton Friedman and the case for flexible exchange rates and monetary rules. Bank of Greece Working Paper no.236
- Dornbusch R. (1976). The theory of flexible exchange rate regimes and macroeconomic policy. *The Scandinavian Journal of Economics*, Vol. 78, No. 2, pp. 255-275
- Friedman M. (1954). *Essays in Positive Economics*. The Economic Journal, Vol. 64, no.256, p 796-799
- Fristedt.S. (2016). “Does the choice of exchange-rate regime effect economic growth?”.
- Genc E.G., Artar O.K. (2014). The effect of exchange rates on exports and imports of emerging countries. *European Scientific journal*, vol.10, no.3
- Ghosh. A.R., Gulde.A.M., Ostry.J.D., Wolf.H. (1996). Does the exchange rate regime matter for inflation and growth? International Monetary Fund Publications
- Hasanov F. (2010). The impact of real oil price on real effective exchange rate: The case of Azerbaijan. German Institute for Economic Research. MRPA paper no. 33493
- Hasanov R., Huseynov K. (2018). The national currency rate of Azerbaijan: after the presidential elections. Center for Economic and Social Development
- International Monetary Fund. (2006-2017). “Annual Report on Exchange Arrangements and Exchange Restrictions”.
- Jahan S. (2017). Inflation targeting: holding the line. *Finance & Development: Back to Basics* p.72-73. International Monetary Fund Publications
- Jakob B. (2016). Impact of exchange rate regimes on economic growth. *Undergraduate Economic Review*, Volume 12. Illinois Wesleyan University
- Jepbarova L., Waikar A., Lee S., Gardner L., Johnson J. (2011). Impact of foreign direct investment on Kazakhstan’s economy: a boon or a curse. *International Journal of Business and Social Science*, Volume 2, no. 22
- Johnson R.B., Swinburne. M., Kyei A., Laurens B., Mitchem D., Otker I. (1999). Exchange rate arrangements and currency convertibility developments and issues. International Monetary Fund

- Juhn G., Mauro P. (2002). Long-run determinants of exchange rate regimes: a simple sensitivity analysis. International Monetary Fund Working Papers
- Jurgen H., Jizhong Z. (2004). The choice of exchange rate regimes in developing countries: A multinomial panel analysis. Leibniz Information Center for Economics. ZEI Working Paper No.B 32-2004
- Kapanadze. S.(2014). Georgian vulnerability to Russian pressure points. European Council on foreign relations. ECFR/106
- Korhonen I., Nuutilainen. (2017). Monetary policy rules for Russia, some new results. Bank of Finland, BOFIT
- Korhonen I., Wachtel P. (2015). A note on exchange rate pass-through in CIS countries. Bank of Finland, BOFIT
- Leigh.D., Lian W., Poplawski-Ribeiro M., Szymanski R., Tsyrennikov V., Yanng H.(2017). Exchange rates and trade: a disconnect? International Monetary Fund Working Paper.
- Levy-Yeyati E., Sturzenegger .F (2001). Exchange rate regimes and economic performance. International Monetary Fund Staff Papers.
- Levy-Yeyati E., Sturzenger F. (2016). Classifying exchange rate regimes: 15 years later. Harvard University, John F. Kennedy School of Government. Faculty Research Working Paper Series
- Liu Q., Lu Y., Zhou Y.(2013). Do exports respond to exchange rate changes? Inference from China's exchange rate reform. National University of Singapore
- Lizardo R.A., Mollick A. (2010). Oil price fluctuations and US dollar exchange rates. Energy Economics, vol.32, p. 399-408
- Mallick H. (2010). Role of exchange rate on services and goods exports: a comparative empirical analysis. Indian Statistical Institute
- Mills.T.C., Wood.G.E. (1993). Does the exchange rate regime affect the economy?
- Mishkin F.S. (1996). "The channels of monetary transmission: Lessons for monetary policy. National Bureau of Economic Research".
- Mukhtarov S., Yuksel S., Ibadov E., Hamidov H. (2019). The effectiveness of exchange rate channel in Azerbaijan: an empirical analysis. Banks and Bank Systems, 14(1), 111-121

Mzhavanadze G., Saha.D. (2016). The exchange rates of the Georgian lari and the Armenian dram in comparison, 2014-2015. ISET Policy Institute Publications.

National Bank of Georgia. (2016). Inflation report.

Ndubuisi G.O. (2014). Interest rate channel of monetary policy transmission mechanisms: What do we know about it. Department of Economics, Philipps-Universitat Magburg Germany

Petreski M.(2009). Regime and economic growth: a review of the theoretical and empirical literature.

Petursson.T.G. (2000). Exchange rate or inflation targeting in monetary policy? Monetary Bulletin 2000/1 of Central Bank of Iceland

Pshenichnikov.V.V., Rodionov.D.G., Zherebov.E.D. (2015). “Currency crisis in Russia on the spun of 2014 and 2015: causes and consequences”. Procedia-Social and Behavioral Sciences 207 (2015) 850-857.

Qureshi S.M., Tsangarides.C. (2010). The empirics of exchange rate regimes and trade: words vs. deeds. International Monetary Fund Working Paper.

Reboredo J.C., Rivera-Castro M.A., Zebende G.F. (2012). Oil and US dollar exchange rate dependence: a detrended cross-correlation approach. Energy Economics, volume 42, p. 132-139

Rogoff K., Obstfeld M. (1995). The mirage of fixed exchange rates. The National Bureau of Economic Research Working paper no. 5191

Rogoff.K.S., Husain.A.M., Mody.A., Brooks R., Oomes.N. (2003). Evolution and performance of exchange rate regimes. International Monetary Fund Working Paper.

Schanbl G. (2005). International capital markets and exchange rate stabilization in the CIS. Tübingen University, Department of Economics and Business Administration

Shambaugh.J.C., Klein.M.W (2004). Fixed exchange rates and trade. National Bureau of Economic Research of USA. Working paper no. 10696

Thi Thuy V.N., Thi Thuy D.T. (2018). The impact of exchange rate volatility on exports in Vietnam: a bounds testing approach. Journal of Risk and Financial Management

Torres. R. (2014). The choice of an exchange rate regime and economic growth. “McNair Scholars Journal”, volume 15.

Urbanovsky. T. (2015). Factors behind the Russian ruble depreciation. *Procedia Economics and Finance* 26(2015) 242-258

Vujanic V., Zarkovic V., Gligoric D. (2017). The impact of the applied exchange rate regimes on the internal balance of transition countries. *Economics* Volume 5, No.2