

DEPARTMENT OF BUSINESS AND MANAGEMENT

Chair of Risk Management

IS RUSSIA AN “OIL AND GAS STATION
MASQUERADING AS A COUNTRY”?
EVALUATING THE IMPACT OF OIL PRICES AND INTERNATIONAL
SANCTIONS ON RUSSIAN ECONOMY THROUGH THE
IMPLEMENTATION OF THE VALUE-BASED ENTERPRISE RISK
MANAGEMENT

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To the Mellins

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INTRODUCTION

As of March 2014, the European Union adopted restrictive measures in response to the Russian annexation of Crimea and the burst of Ukraine conflict. Shortly after, Russia banned food imports coming from countries that had previously boycotted Russian products and services, such as Europe, USA, Australia and Canada. What is commonly referred to as the sanctions regime has contributed to the exacerbation of the economic and financial distress the country was already going through: the unprecedented drop in oil prices and the over-dependence of the country on the oil and gas sectors led to great uncertainty regarding the country's future direction, bringing with it the domestic currency's steep depreciation, the deterioration of the fiscal balance and a consistent drop in foreign investments. Over the last years, Russian purchasing power decreased sharply and unemployment widened, thus determining a strong contraction in domestic consumption, which represents a significant part of GDP. As a consequence, Russian economy has been declining significantly since 2014, and this trend is still far from being reversed. Within this context, this paper aims at investigating and analysing cause and effect of the shocks Russia is experiencing through the adoption of the value-based Enterprise Risk Management, the process through which companies identify, measure and manage key risks one entity can be confronted with.

By the word "risk", people generally refer to as any deviation from expected, thus including both downside and upside volatility along a specific value. The importance of Risk management discipline has been broadly recognized after the disastrous events, both man-made and natural, of the last years. The long-lasting financial crisis, the volatility of financial markets on which the global economy is based,

spreading political instability in the world have raised global awareness of the need of an integrated approach to managing risks, irrespective of the very nature of the concerned organization. Regardless of its direction, volatility should be unconditionally stigmatized, as the high degree of uncertainty it brings about certainly does not benefit the entity it affects. So far, the idea of monitoring risks and quantifying their potential impact has only been employed for corporate entities, thus linking the notion of Risk management only to those organizations that operate for profit. The purpose of the present paper is to implement the value-based Enterprise Risk Management, so that it can be generalized to a non-corporate entity and, in the present case, used to scrutinize and quantify key risks arising from the current political and economic situation of Russian Federation. The choice of this subject is not only driven by personal interests, but also by the peculiarity of the country's economic structure, which remains largely undiversified and over-dependent on foreign imports. The "perfect storm" Russia is going through arises from the fact that the oil and gas sector represents a significant share of the country's GDP and this hinders the development of other sectors, until recently considered as less profitable and not worth investing. The provocative title of this paper refers to a declaration of Senator John McCain in 2014 during a weekend visit to Ukraine, whose intention was to highlight, probably in an awkward and inappropriate manner, the disproportion of the oil and gas sector compared to all the others. The answer to the question "is Russia an oil and gas station masquerading as a country?" is certainly negative. However, this economic structure presents lots of drawbacks especially in a new era of highly volatile commodity prices, determined by exogenous factors that can hardly be controlled in a globally integrated economy.

The great importance granted to the energy sector has deeply conditioned the country's economic strategy over time, which consists in exporting huge quantities of oil and gas and importing any other consumer goods from abroad. Such a poor diversification of Russian economic structure makes the country extremely vulnerable to external shocks, especially to those related to the energy sector. This is the starting point of the economic and financial crisis that Russia is currently experiencing. The persistence of the sanctions regime further exacerbates this vulnerability because it restricts the flow of traded goods from and to Russia which are vital to satisfy the

economic and social needs of its people. The interaction of these shocks is thus bringing to light number of issues the country has to deal with shortly.

The value-based enterprise risk management represents a valuable tool able to quantify the impact of these risks according to current expectations as well as to measure the effects of a possible mitigation action aiming at reducing the country risk exposure. Of course, the adoption of this model for a non-corporate entity requires number of adjustments, mainly related to the choice of the relevant metrics, on which it is possible to quantify risks in terms of their value impact. For the purpose of this analysis, GDP and its compound annual growth rate shall be considered as the metrics that identify the country exposure to commodity and sanctions risk. The model provides with a comprehensive approach that shows both the individual impact of each risk on the metrics and the combined impact of all key risks together, thus fully capturing any counterbalancing or exacerbating effects arising from the risk interactivity.

This paper includes three chapters, each of them corresponding to a specific process-step of Enterprise Risk Management. The first chapter represents Risk identification, the process that determines which risks can be considered as key-risks. It involves the identification and categorization of all potential risks and the identification of key risks. The second chapter corresponds to Risk quantification process, which attempts to quantify the potential impact of key risks on the relevant metrics. This chapter offers a good opportunity to get a better understanding of the role that sanctions and low commodity prices are having on Russian economic decline. The third chapter corresponds to Risk mitigation, which quantifies the effects that mitigation policies could possibly have on Russian economy. They involve the re-orientation of industrial and commercial policies, which aim at reducing the share of hydrocarbons in Russian economy and at strengthening economic and diplomatic ties with alternative partners of Europe, such as China, India or the Eurasian Economic Union states. Mitigation seeks to diversify Russian economic structure, both domestically and internationally. Its purpose should be to develop non-energy sectors and explore new commercial and diplomatic routes in order to avoid shocks arising from the volatility of financial markets or ambivalent international relations. The long-

standing issue in Russian political economy related to the over-dependence of the country on commodity prices should be addressed by deeply understanding the underlying dynamics. Over time, Russia has strongly benefited from its upside risks, mainly by exploiting unprecedentedly high commodity prices for its economic development. This has allowed the country to achieve growth rates that were unconceivable some years earlier, bringing it to be one of the members of the BRIC states. Therefore, an effective risk management discipline and the adoption of mitigation policies would involve the reduction of the role of commodities in Russian economy that were the main drivers of its remarkable growth – and recently of its recession. Political decision as to whether abandon the current economic structure that brought about very high growth rates and periods of stagnation must not be taken for granted.

The value-based Enterprise Risk Management can detect future trends based on current expectations on a pre-mitigation basis, but it can also serve as a valuable tool able to support political economy decisions on a post-mitigation basis. It allows for a better understanding of risk volatility- both upside and downside- and of the trade-off between a more stable growth path at a slower pace, and a highly volatile growth, which alternates double-digits growth rates to severe recessions. Choosing the first alternative means making efforts to turn the “oil and gas station” model to a more sustainable and reliable one. Implementing the value-based ERM can help assess the feasibility of this conversion as well as the weaknesses arising from the *status quo*.

CHAPTER I

IDENTIFYING RUSSIAN POTENTIAL THREATS: A QUALITATIVE ANALYSIS OF THE COUNTRY'S ECONOMIC AND SOCIAL LANDSCAPE

Over the last years, Russia has been confronted with multiple shocks arising from adverse trends in the global commodity market and from strained international relations with the West. The unprecedented drop in oil prices and the poor diversification of Russian economy are the main drivers of the country's recent economic decline, which has been further exacerbated by the persistence of the sanctions regime. In order to manage the current situation, considerable efforts are being made, namely the adoption of specific fiscal and monetary policies that are so far proving effective to the stabilization of the country. These shocks arise from the peculiar international political and economic environment, as well as from the specificity of the country's economic structure.

The main purpose of this chapter is to perform a qualitative risk assessment of the potential risks the country can be confronted with. For this purpose, this chapter firstly identifies and categorizes *by source* all the risks the country can be exposed to. Secondly, through a series of interviews it attempts to prioritize and rank the risks, and thus come up with a list of five potential risks that will be further analyzed. Then, a special focus will be put on long-term risks, the – the so-called prospective risks and on political stability.

1.1 RISK CATEGORIZATION AND DEFINITION: SCREENING ALL POTENTIAL RISKS

The risk categorization and definition process-step consists in constructing a comprehensive list of known potential risks that should be reasonably comprehensive in terms of categories and subcategories¹. This list includes a risk categorization hierarchy including risk categories, risk subcategories, risk divisions, the risks themselves, and a definition clarifying the scope of the risk.

When evaluating country risk, risk categories are represented by political, financial and economic risk. Financial risk is defined as the risk over the ability of a national economy to generate enough foreign exchange to meet payments of interest and principal on its foreign debt². Thus, it includes unexpected changes in external market prices, rates and liquidity supply and demand, banking capitalization, currency price and inflation. Economic Risk mainly relates to the likelihood that economic development in one country may be negatively affected by unexpected changes in the macroeconomic environment, such as the state of the economic cycle, socio-economic conditions, investment-related issues, or fiscal and sovereign imbalances. However, political risk remains the hardest one to define and quantify, as it mainly refers to the political stability of the country. It thus includes number of subcategories, such as governability, electoral cycle, institutional effectiveness, internal and external conflicts³. Table 1 shows all the risks Russian Federation could be confronted with, all rigorously categorized by source⁴. A definition for each risk is also provided.

¹ Seagal. *Corporate Value of Enterprise Risk Management. The Next Stop in Business Management.*

²NASDAQ. "Financial glossary"

³ Political risk categories are partially based on the Country Risk Model of the Economic Intelligence Unit.

⁴ It shall be noticed that for the risk categorization some risk-categories have been borrowed from PRS Group methodology concerning country risk evaluation⁴.

Table 1-Risk categorization and definition tool

Risk category	Risk subcategory	Risk	Definition
Political	Political stability	Government unity	Inability of the government to exercise its functions.
Political	Political stability	Popular support	Unexpected changes in the support people have for the Russian leadership
Political	Institutional effectiveness	Law breach	Inability of the State to enforce the law
Political	Institutional effectiveness	Corruption	Unethical business practices negatively impacting the normal course of business
Political	Political effectiveness	Quality of Bureaucracy	Deterioration of services of general interest provided by the State
Political	Internal conflicts	Civil unrest	Disturbance caused by a group of people which represents serious threatening for social stability
Political	Internal conflicts	Terrorism	Political violence perpetrated by terrorist movements across the country
Political	Internal conflicts	Ethnic tensions	Tensions arising from racial or language divisions
Political	External conflicts	Military interventions abroad	Excessive financial engagement in ongoing military operations abroad (Ukraine, Syria...)
Political	Diplomatic conflicts	Sanctions	Disputes with the West and extension of sanctions
Financial	Banking sector risk	Liquidity	Unexpected changes in liquidity supply or demand (shortage of foreign currency reserves ..etc)
Financial	Banking sector risk	Assets deterioration	Unexpected deterioration of assets in banks' capitalization

Financial	Banking sector risk	Access to financing	Worsening of conditions to gain access to external financing.
Financial	Market	Currency	Unexpected changes in exchange rates.
Financial	Market	Inflation	Increase in the general level of prices for goods and services
Financial	Market	Commodity prices	Persistence of low commodity prices, namely oil and natural gas.
Financial	Market	Interest rates	Unexpected changes in the absolute level of interest rates
Economic	Sovereign risk	Public Debt	Inability of the country to honor its debt obligations
Economic	Sovereign risk	Current Account	Risk of incurring in excessive deficit procedures
Economic	Sovereign risk	External shocks	Unexpected changes in international economic environment (fall in trade volumes, changes in external consumers' disposable income...)
Economic	Socio-economic conditions	Unemployment	Persistence of high unemployed rate
Economic	Socio-economic conditions	Poverty	Rise of the number of people falling below the poverty line
Economic	Socio-economic conditions	Consumers' confidence	Fall in consumption resulting from more pessimistic expectations regarding the state of economy
Economic	Investment	Concentration	Unexpected losses resulting from poor diversification of assets.
Economic	Investment	FDI	Fall in Foreign Direct Investments
Economic	Fiscal imbalances	Capital flight	Unexpected outflow of capital and financial assets due to events such as

			political or economic instability.
Economic	Population Shifts	Demography	Changes impacting social characteristics of a population (aging population... etc.)
Economic	Population Shifts	Deterioration of human Capital	Inability to face shortages of qualified workforce

When categorizing and identifying the risks, it is of the outmost importance to clearly define the kind of scenario imagined. In accordance to the value-based Enterprise Risk Management, the reference scenario is the credible worst-case scenario, which "is not the most unlikely of events, but neither is it a common event. It is somewhat in between, but still represents a fairly pessimistic scenario with a severe impact [...] yet it is a robust enough risk scenario to capture the full impact of this type of risk".⁵

It shall be noticed that categories and sub-categories displayed in the table could be applied to any generic country, however their definition is tailored on Russian specific situation. Of course, each risk represents *per se* uncertainty, better defined as any unexpected changes in the analyzed environment, no matter what this environment is like. However, for a matter of practicality it is necessary to narrow down the number of risks to be analyzed and identify the ones that represent the biggest threat to the stability of the country. Which begs the question: how can one identify the major risks? According to which criteria should one risk be considered as a more serious threat than another? In Risk Management, there are two criteria that help identify the level of threat one risk can represent: likelihood and severity. The first one defines the possibility that a risk occur, while the second one considers the amount of harm that can be expected once it occurs. Table 1 provides with a valuable overview of all the potential risks the country can be confronted with. However, in order to identify those risks from which Russian Federation should seek for a more pro-active and determined protection in the short-term, a qualitative risk assessment tool has been developed, which supports the risk identification overall process.

⁵ Seagal. *Corporate Value of Enterprise Risk Management. The Next Stop in Business Management.*

1.2 QUALITATIVE RISK ASSESSMENT: PURPOSE AND PROCESS

The aim of the qualitative risk assessment is to prioritize and rank the list of major risks. The list arising from this process-step consists of five most important risks ranked according to their likelihood and severity. Typically, the process of the qualitative risk assessment involves a certain number of survey participants, who are asked to rank the risks according to well-established criteria. The identification of survey participants is crucial, as the interviewees must have a good understanding of the subject and be able to answer specific questions. For the purpose of this analysis, twenty people have been selected, all of them with a very good knowledge of Russian issues: among the invitees there are PhD candidates in International relations with a special focus on Russian politics, graduate students who have participated to dedicated programs (double Degrees or exchange programs in the Russian Federation). This choice has been made both to endorse multiple points of view and to ensure that interviewees have a good comprehension of the main issues of the country. They have been asked to assign qualitative scores to each risk based on the Risk Identification and Categorization tool and the qualitative scoring criteria (Table 2).

Table 2-Qualitative scoring criteria

Likelihood	Qualitative scores	Severity (as a percentage of GDP)
70%	Very High	> %2
50%	High	1-2%
33%	Medium	0.6-1%
10%	Low	0.1-0.5%
2%	Very Low	<0.2%

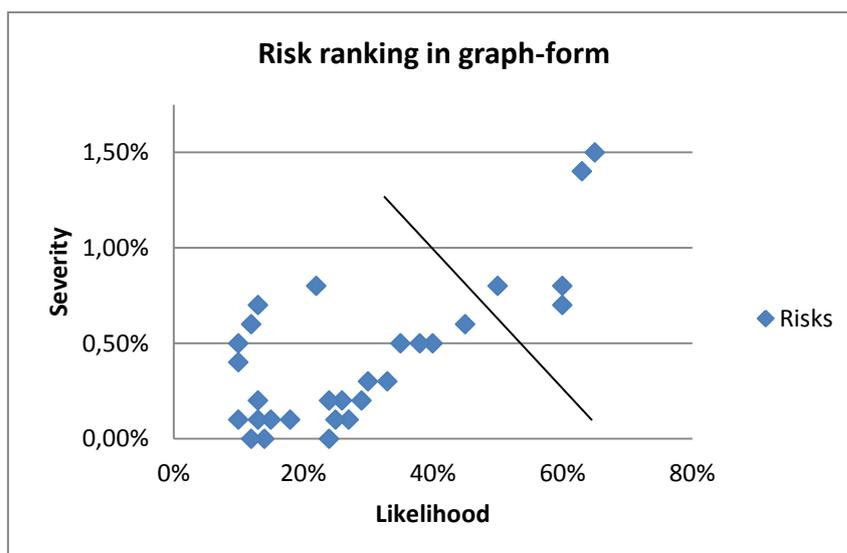
This table shows guidelines on how the qualitative scores concerning likelihood and severity should be assigned to each risk. The interviewee can point out five different qualitative scores that swing from very high to very low. To each qualitative score corresponds a specific value for severity and a specific value for likelihood. In

particular, the severity criteria consist in a range of values representing the impact on GDP in percentage form- third column-, while the likelihood criteria-displayed in the first column- provide participants with a scale of values representing the probability that the risk will eventually materialize.

It shall be noticed that participants are asked to rank each risks assuming as reference scenario the so-called worst-case scenario, and considering a near-term time horizon- generally two or three years. Indeed, long-term risks do not represent an onset threat and it is thus wiser to focus on a risk that will probably materialize soon.

The interviews should produce a new list of five risks, displaying each risk scored as a function of their likelihood and severity. As a result of the data aggregation, these five risks arise from a large consensus among the interviewees about their high probability to occur and their degree of severity. In other words, in the final list of major risks for Russian economy will typically appear those risks to which a consistent number of survey participants have assigned high ratings (either Very High or High) to both their likelihood and severity. The aggregation of data involves the computation of the average value of severity and likelihood scores assigned by all the participants to each risk. The outcome has been reported in a graph that helps identify the five major risks based on their position in Figure 1.

Figure 1-Selecting major risks



Each risk has been scored according to its likelihood- on the x-axis- and severity- on the y-axis. Those risks to the upper right of the line are the key risks. In particular, risk arising from commodity prices is the risk perceived as highly likely and disruptive for Russian economy (the dot in the upper right of the graph), due to the peculiar economic structure of the country that remains largely undiversified. Likelihood for this risk is also perceived as very high, and this is in line with the most acknowledged research centers' estimates, which predict a decade of low commodity prices –although in the next years they foresee an increase to the current level.

Sanctions risk is considered as one of the most threatening risks, as a consequence interviewees have assigned high likelihood and severity to it, although slightly lower than the scores assigned to commodity risk. When discussing with some of them about the reasons for the assigned scores, they argued that the disagreement of European countries on this issue coupled with the strong pressing on Washington's side is likely to extend the sanctions regime for long. Also, the impact of this risk is perceived as very high, due to the uncertainty that the sanctions regime engenders.

It is no surprise that currently sanctions and commodity prices are considered as the biggest threats to Russian economy, although it was of great interest to identify the remaining three risks. With this regard, it turns out that interviewees chose currency, corruption and capital flight. In particular, corruption is broadly considered as an endemic disease that widely spread in the Russian economic and social fabric, while currency and capital flight have been exacerbated by the current economic and political situation. Below is provided the list of major risks, as it is evident from the interviews' outcome.

Table 3-List of major risks

Risk category	Risk subcategory	Risk
Financial	Market	Commodity prices
Political	Diplomatic conflicts	Sanctions
Financial	Market	Currency
Economic	Institutional Effectiveness	Corruption
Political	Fiscal imbalances	Capital flight

It shall be noticed that these tools are the mere representations- in graph and list-forms- of the general consensus of the interviewees on the potential risks' likelihood and severity. The interviews suggest that the two risks perceived as the most threatening are by far commodity and sanctions, outperforming the remaining ones. In the next paragraphs we will briefly analyze the two key-risks- commodity and sanctions risk- and then currency, capital flight and corruption. Then, the next chapter will attempt to quantify the impact that the two major risks have on GDP, possibly underlying the gap between the interviewees' expectations and the outcome of the model.

1.3 COMMODITY RISK: WHEN THE ECONOMIC STRUCTURE IS POORLY DIVERSIFIED

Not many countries in the world rely on natural resources as Russia does. It is the first-largest producer of crude oil and the second-largest producer of natural gas. These two resources represent over 60% of Russia's exports, roughly 50% of government revenues and make up over 30% of the country's gross domestic product. In 2013, the total exports of Russia were worth 526 billion USD and oil alone accounted for more than half of this value⁶. Such a high role played by commodities in Russian economy make the country a natural resource-based, thus undiversified, economy. This expression identifies those economies where natural resources account for more than 10 per cent of GDP and 40 per cent of exports. This specific economic structure undeniably presents some important shortcomings. Rudiger Ahrend⁷, Senior Economist in the Non-Member Economies Division of the OECD Economics Department, argues that one of the main challenges a poorly diversified economy faces is the risk of developing specific institutional pathologies often associated with heavy

⁶Swedish Institute for European Policy Studies, *Russia's economic troubles – a perfect storm of falling oil prices, sanctions and lack of reforms*.

⁷ Ahrend, R. "How to Sustain Growth in a Resource Based Economy? The Main Concepts and their Application to the Russian Case."

reliance on natural resource sectors. The reason is twofold. First of all, a higher natural resource share in the economy is often associated with greater inequality of incomes, which strongly undermines growth in the long-term. Secondly, any allocation of talent in natural resource economies is biased in favor of the resource sector. This leads to the further development of the resource sector to the detriment of the other ones, thus contributing to a higher risk concentration.

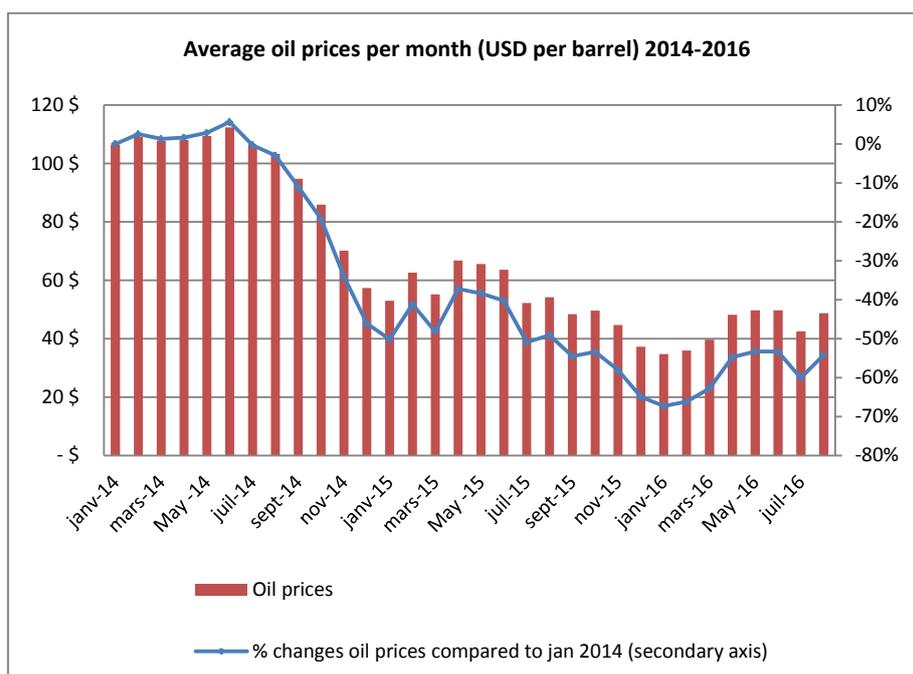
He also mentions the risk of Dutch disease, which refers to the negative impact on an economy resulting from a sharp inflow of foreign currency, such as the discovery of large oil reserves. The currency inflows lead to currency appreciation, making the country's other sectors less competitive on the export market. Also, a stronger currency means a higher purchasing power for foreign products, which boosts imports while decreasing exports. This can lead to the deindustrialization of industries apart from resource exploitation, which are to be moved to cheaper locations⁸. However, such a high dependence on natural resources also increases the country's vulnerability to external shocks. Indeed, resource-based economies are particularly exposed to the shocks that arise from sharp falls in the prices of the country's main export commodities. It shall be noticed that commodities in financial markets are extremely volatile, and this exacerbates even further the Russian current distressed situation.

In the light of these findings, it is no surprise that the current levels of commodity prices have seriously undermined Russian economy. Record low crude oil prices to 30\$⁹ per barrel as of February 2016 from a pre-crisis level of 120\$ per barrel have proven disruptive to Russian economy. The chart below shows the trend in oil prices from January 2014 to August 2016. While the bars show crude oil monthly prices, the line on the secondary axis shows the contraction in oil prices compared to January 2014. After the sharp drop in the second half of 2014 (-50% compared to six months earlier), and again in January 2016 (-70%) oil prices are stabilizing around 50\$ per barrel

⁸ Financial Times, "Lexicon".

⁹ Oil prices data from Bloomberg. Crude oil and natural gas , 2016.

Figure 2-Crude oil prices 2014-2016



Source : Investing.com

The shortcomings arising from poorly diversified economy have been further stressed by the World Bank in its Russia Economic Report¹⁰, where it suggests that Russian contraction is mainly due to the decline in oil prices that persisted well beyond initial expectations. Such low oil prices led to an excess supply capacity in the global hydrocarbon market, which, together with a secular growth deceleration in key emerging markets, have spurred a further decline in oil prices since mid-2015¹¹.

Commodity price levels translate in a lower Russian GDP through two main transmission channels: government revenues and exports. As far as the former is concerned, when oil and gas revenues account for more than 50% of government revenues, low commodity prices halved directly translates into a dramatic decrease in government revenues. In this regard, the Russian Ministry of Economic Development gave a clear picture of the impact that the current price levels can have on Russian budget. In particular, the 2016 budget has assumed oil prices at 50\$ per barrel for the whole year, which is considerably higher than the annual average of 40\$ per barrel.

¹⁰ World Bank, *Russia Economic Report. The long journey to recovery.*

¹¹ Ibidem

Even after considering crude oil prices at 50\$ per barrel, Russian budget would still be short of 40 USD billion (roughly 2,500 billion RUB), which means 3% deficit on GDP.¹² This means that to be at equilibrium, Russia needs an average crude oil price of 80\$ per barrel¹³. At the same time, low commodity prices also mean lower export revenues for Russian companies and, through the taxation, for the State. This hinders public and private investments and impoverishes the entrepreneurial fabric of the country.

What makes Russian current economic and financial distress even worse is the great interdependency between oil and gas prices: according to historical evidence, higher oil prices mean higher gas prices and vice versa. This correlation is a double-edged sword for Russian public finance. When oil prices are high, gas prices follow and Russian GDP benefits from this situation. However, when oil prices decrease gas prices decrease as well, oil and gas revenues deteriorate, thus impacting public investments too. As a consequence, it can be assessed that commodity prices are the main drivers of Russian growth – as it was the case when oil prices peaked to 120\$ per barrel- as well as of Russian recession –as it is the case now. It follows that Russian recovery cannot be achieved without a substantial increase in oil and gas prices, at least in the short term. In the long-term, however, structural reforms aiming at diversifying Russian economy will be needed. These reforms will be further analyzed in the third chapter. Another reason to start conceiving policies that reduce Russian over-dependence on commodities is represented by the fact that crude oil prices will remain low for a long time. This is mainly due to the excess of oil supply and to the lack of a stable *consensus* among the OPEC countries, which are struggling to reach an agreement concerning the cut in global oil production, which would drive oil prices upwards. At the time of writing (September 2016), OPEC countries have reached a preliminary agreement, whose conditions –quotas, compliance, and timing- will be negotiated in November.

¹² Ministry of Economic Development (Russia), “Alexey Ulyukaev—Bloomberg TV: Economic Growth of Russia Will Resume in 2016–2017,” January 15, 2015,

¹³ Bloomberg, Russia Bows to Cheap Oil as Putin Aide Sees \$50 Price for Budget

However, tense relations between Iran and the Gulf monarchies, exacerbated by the disagreement on Syrian conflict resolution, are likely to further delay the OPEC agreement.

1.4 SANCTIONS RISK : WHEN INTERNATIONAL RELATIONS BECOME STRAINED

In July 2014, the United States, the European Union and other Allies enacted in a coordinated manner economic sanctions against Russia and re-confirmed them one year later, as Moscow failed to fully implement February's cease-fire accord (Minsk II). These sanctions include:

- Measures dealing with access to the capital markets for specified financial and defense institutions
- Restrictions on the export of dual-use goods and technologies
- Restrictions on dealing with technologies listed on the Common Military List
- Sanctions targeting individuals and entities through travel bans and asset freezes¹⁴

While the fourth restriction is likely to not have any serious effect on Russian economy as a whole, the others have a major impact on Russia's further functioning via three main channels.

First of all, restrictions to capital markets target designated Russian state-owned enterprises in the banking, energy, and defense sectors. In 2007-2013, Russian nonfinancial institutions obtained loans in the EU countries worth over US\$1 trillion¹⁵. As any other company across the world, Russian companies widely used the debt refinancing schemes. Following the adoption of restrictive measures, such opportunities have been sharply limited. The direct result is that large companies have

¹⁴ Hansson et al. *Overview of the U.S. and EU Sanctions on Russia*

¹⁵ Shirov, A.A. et al. *Estimating potential effect of sanctions on economic development in Russia and EU*

to resort to equity financing or internal debt financing, while small and medium enterprises see their loan opportunities significantly reduced.

However, evidence shows that corporate deposits in Russian banks are increasing, as Russian companies are repatriating cash held abroad as a consequence of fearing an escalation in Western financial sanctions. The repatriation provides Russian banks with precious hard currency, fuelling foreign currency reserves. According to the Central Bank of Russia, corporate deposits have increased by 15% in 2015, which have eventually been reinvested to finance clients cut out from Western financial markets. Although untenable in the long-term – probably in the mid-term as well-, restricted access to financing is pushing Russian financial institutions towards a partial reworking of the local financial system. This regulation heavily impacts investments in the Russian Federation: cutting a large share of the Russian banking sector from EU-based sources of financing strongly reduces the investment capacity of the country.

Secondly, interdiction to sell 'dual-use' technology to Russia represents another serious threat, which requires significant political efforts to be dealt with properly. The term "dual-use" designates all those products intended for the exploration of oil and gas deposits. This specific regulation has been conceived to erode Russia's competitive advantage in its core sectors in the long-term. Therefore, should sanctions remain in force in the next fifteen or twenty year, the lack of advanced technology for oil drilling and extraction would make oil production costs too high to justify any investments in the field and Russia would be eventually driven out of the market. Also, projects in the remote regions, such as Arctic offshore and Siberia pipeline projects could never see the light, and this would significantly inhibit long-term economic growth of the country.

Thirdly, Western sanctions negatively impact growth in the short-run via weaker trade exchange. As far as the former is concerned, it is the key factor that balances out domestic demand and supply in a resource-based economy such as Russia. Through the imports and exports framework, the country succeeds in meeting the domestic demand despite the undiversified and poor consumer goods domestic production. In this regard, Western sanctions have seriously jeopardized trade between Russian and the European Union. As of 2014, Russia was the third European trading partner, from

which European Union imported over 180 million dollars of goods, mostly raw materials, in particular, oil (crude and refined) and gas.¹⁶ The European Union was the first commercial partner for Russia, and the most important investor in the country. It is estimated that almost 75% of Foreign Direct Investment stocks in Russia come from EU Member States¹⁷. Since the conflict in Ukraine, the Partnership and Cooperation Agreement, which came into force at the end of 1997 to govern trade policies between Russian Federation and Europe, has been suspended. European exports in Russia fell by around 13%¹⁸ and European demand for Russian products not affected by sanctions has weakened.

Nevertheless, in retaliation for western sanctions, Russia has adopted what is commonly called the Russian counter-sanctions. They include a ban on wholesale imports of fresh food products from many Western countries in 2014. In November 2015, Russia extended those sanctions on Turkey, after Turkish Air Force jet shot down a Russian aircraft near the Syria–Turkey border on 24 November. Such a strong reaction to sanctions over its annexation of Crimea and support for separatists in eastern Ukraine has contributed to further deteriorate Russian financial stability, with food prices increasing and quality declining.

Number of studies has tried to quantify the impact that the sanctions regime has on Russian growth. According to the International Monetary Fund, sanctions cost the Russian economy 1-1.5 percent of GDP a year, although the political and diplomatic costs are even higher.¹⁹ However, in the long-term prolonged sanctions “could lead to a cumulative output loss over the medium term of up to 9% of GDP, as lower capital accumulation and technological transfers weakens already declining productivity growth”²⁰. The IMF report also suggests that probably the impact of European sanctions and Russian retaliation impacted Russian GDP even more than the record fall in oil prices. Russian press makes a different evaluation of the sanctions’ effects on the economy. The Institute of Economic Forecasting of the

¹⁶ Directorate General for Trade, European Commission. *Trade in goods with Russia*

¹⁷ Ibidem

¹⁸ Szczepański, M., *Economic impact on the EU of sanctions over Ukraine conflict*

¹⁹ International Monetary Fund, *Russian Federation*

²⁰ Ibidem

Russian Academy of Sciences²¹ published an interesting research paper which develops a more comprehensive approach to analyze Russia's economic conditions. First of all, it argues that Russia was already experiencing an economic downturn, well before July 2016. It also suggests that significant problems in Russia's economic dynamics go back to early 2013, when the GDP growth rate shrank to 1.3% against 3.2% in 2012. Stagnation continued in 2014, and it was due to two key factors: falling prices in commodity markets and a significant reduction in investment activities of major Russian companies. The authors add that the "key adverse effect on economic dynamics (has been) followed by the low level of investment activity caused by mismatch between economy financing schemes and actual market. Therefore, the fundamental factors contributing to the unfavorable economic development in 2013-2014 were mostly homemade"²². Most importantly, it focuses on long-term effects of the sanctions system. According to this analysis, while in a short-term perspective sanctions may have to a certain extent deteriorated Russian economy; in the long-term they are likely to boost domestic production and trigger import-substitution in the key-sectors of Russian economy. In the last chapters this issue will be further analyzed. However, the Russian government is already undertaking efforts that go in this direction: as of August 5th, the Government created an *ad-hoc* Commission, "designed to coordinate the activities of federal and regional executive bodies, local governments and organizations in implementing government policy on import substitution"²³. On 16th April, President Vladimir Putin announced: "As for how long we will have to endure the sanctions, (...) we must benefit from the situation with the sanctions to reach new development frontiers. Otherwise, we probably would not have done it. This goes for import substitution policies, which we are now forced to implement. We will move in this direction, and I hope that these efforts will foster the development of the high-tech sectors of the economy with higher growth rates than previously seen"²⁴.

²¹ Shirov, A.A. et al. *Estimating potential effect of sanctions on economic development in Russia and EU*.

²² Ibidem

²³ Ministry of Economic Development of the Russian Federation, *Formation of the Government Import Substitution Commission and its members*

²⁴ President of Russia, Official Web site. *Direct Line with Putin*. President Putin also suggests that noticeable results have been achieved, especially for what concerns industrial production and agriculture: "industrial production has gone up slightly more – by 1.7 percent, while the processing

Apparently, import substitution has not brought about noticeable changes yet, except for food industry, but the efforts made to achieve a higher level of independence from European consumer goods could represent a considerable threat for European suppliers. Should sanctions remain in place in the medium-term, European suppliers will probably see the Russian market share dramatically reduced, as part of Russian consumers will have found alternative supply channels. This is why a heated debate about the sanctions regime is taking place among EU member States. Those countries that developed close trade relationships – such as Italy and Greece- are reluctant as regards the extension of the sanctions regime. Other countries -those that not long ago were incorporated in the Soviet Union- back the roll-over of the sanctions for the foreseeable future. The debate is still open, but under Washington pressures, the European Union will arguably renew the regime currently in place. Moreover, the political elites in Europe and the United States have attached so much political importance to the sanctions that they have become irreversible, at least without a significant change on the part of Russia, which is unlikely to occur.

1.5 MONITORING THREE ADDITIONAL RISKS: CURRENCY, CORRUPTION AND CAPITAL FLIGHT

Over the last years, low commodity prices and the adoption of sanctions have represented the key-risks for Russian economy. However, the country has for long suffered from other issues due to both economical and historical reasons that the qualitative assessment has properly identified.

Among these issues, currency risk is raising a concern over Russian economic and financial stability: the weakening of the ruble, which is being negatively impacted by the drop in oil price, is putting a considerable pro-inflationary pressure on Russian

industry – by 2.1 percent. We have set a new record in oil production – 525 million tons, which is the highest in recent history. We also took in the largest grain crop in recent history – 105.3 million tons. Overall, agriculture demonstrated very good results with a 3.7 percent growth”.

economy, and this trend is expected to continue in 2016²⁵. In order to contrast inflation, the Central Bank of Russia decided to use a “moderately tight monetary policy” and to keep interest rates high and stable at 11% for year 2016²⁶.

So far, this policy seems to have worked. According to the federal State Statistics Service, the average CPI ²⁷ inflation rate remained double digits during 2015 at 15.5%, reaching a 17% peak in March 2015. Western expectations regarding the path of Russian inflation rate for the next years are unanimous: according to the OECD, International Monetary Fund²⁸, the inflation rate is consistently slowing down to about 8-9% as of in 2016 and 6-7% in 2017.²⁹ Expectations are far more optimistic according to the Central Bank of Russia: annual inflation will stay below 6% in March 2017 and will reach 4% by the end of the year. Inflation has already heavily impacted the consumption path of Russian low and middle class via the reduction of real wages and purchasing power. Thus, in 2015 ruble depreciation brought about a sharp fall in private consumption (-10.1%)³⁰ and for 2016 the trend should be alike, although considerably mitigated if compared to 2015.

As Russian economy is deeply entrenched with commodity prices, the appreciation or depreciation of the ruble too is strongly related to them. Therefore, when oil- and gas-prices are high, a consistent part of government revenues are guaranteed and there is very little doubt about Russia being able to service its debts to investors. In this case, confidence of financial markets about the ruble stability remains unchanged, and no downward pressure is exerted on the ruble. On the contrary, low oil prices shake investors' confidence on Russian economy, bringing them to remove their capital from the country. In this case, the demand for Ruble currency decreases, driving down the price of the currency³¹. The graph below shows that the correlation between oil prices and USD/RUB exchange rate has been almost perfect since January 2014.

²⁵ Euler Hermes Economic Research, *Country Report: Russia*

²⁶Central Bank of Russia: *the Bank of Russia has retained its key rate at 11.00% p.a.*

²⁷Federal State Statistics Service, 2016

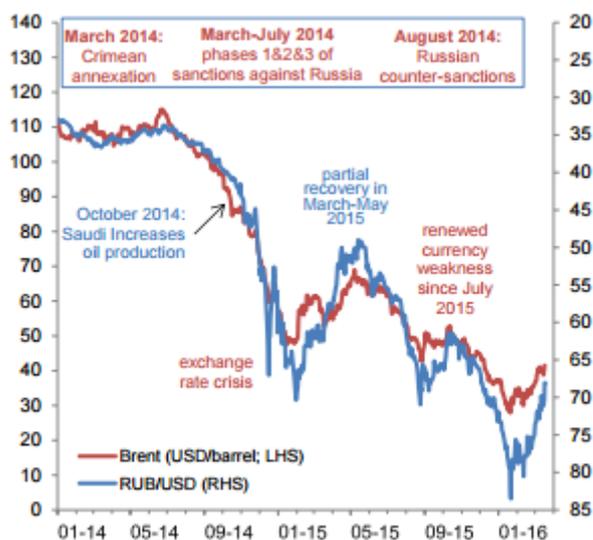
²⁸International Monetary Fund, 2016

²⁹Central Bank of Russia. 2016

³⁰ Ibidem

³¹ A recently published paper by Karimli, T., Jafarova, N., et al. for the ”. Graduate Institute of International and Development Studies titled “Oil Price Pass-Through into Inflation: The Evidence from Oil Exporting Countries” shows the channels through which a shock in oil prices

Figure 3- Brent oil price and USD:RUB exchange rate



Source: IHS, Euler Hermes

A weaker Ruble has a severe impact on companies that have significant FX-denominated liabilities and that will thus have difficulties to refinance maturing debt. Taken together with the effects of the deep recession, Euler Hermes³² expects corporate insolvencies to rise by +7% in 2016.

Notwithstanding the steep depreciation of the ruble over the past years, the Central Bank of Russia has succeeded in avoiding currency exchange rate disaster thanks to the high level of foreign currency reserves: since February 2016 the level of international reserves experienced a considerable contraction, from 448 million dollars in to 323 two years later³³. It shall be noticed that Russia is among the ten countries with the biggest Forex reserves, and this allowed it to succeed in meeting balance of payments' financing needs.

is transmitted into inflation in oil exporting countries, namely Azerbaijan, Kazakhstan and Russia. According to the paper, empirical evidence shows that the level of inflation in these oil-exporting countries responds significantly to oil price shocks. As far as Russia is concerned, oil prices shocks are transmitted in Russian economy through the fiscal channel: as fiscal expenditures demonstrate pro-cyclicality in these economies, excessive budget spending can trigger inflationary pressures during oil price booms or during a recession, the latter requiring a strong intervention of the State in the economy through the expenditure channel.

³² Euler Hermes Economic Research, *Country Report: Russia*

³³ Central Bank of Russia, 2016.

Currency depreciation, if orderly and gradual, can also boost a nation's export competitiveness and may improve its trade deficit. The weakening of the ruble could serve to partially set off the negative impact of the external shocks on the economy, and help Russian products gain competitiveness. For instance, in more diversified oil-exporting countries, such as Canada and Australia, a weaker currency boosts exports in the manufacturing and agriculture sector which can drag the economy out of recession. This buffer is much less effective in Russia, where any other sector, except for energy, keeps its potential largely unexploited. Again, appropriate structural reforms would reduce the high dependence on the country's natural resources and lead to a stronger and more stable currency on international financial markets. In addition, sanctions extension could inadvertently push the country to pursue a higher level of diversification and invest and develop other sectors until now not realizing their potential.

Further concerns about Russian stability include corruption. The World Bank's governance indicator, which represents an indicator of corruption perception, ranks Russia as 168th out of 215³⁴. Corruption is prevalent in the judicial system and public procurement. The business environment suffers from inconsistent application of laws and a lack of transparency. The regulatory inefficiency increases the cost of doing business for the companies, which face challenges when dealing with licenses and permits. The doing Business Report 2016 shows that it is particularly hard to get construction permits for companies operating in Russia. "Concerning the new national anti-corruption plan for the years 2016-2017, we consider that it must have the next priorities: the first is to enhance work in eliminating the conflict of interests taking into account the legislative changes regarding the tasks set forth by the head of state..." announced Sergei Ivanov, the Chief of Staff of the Presidential Executive Office during a meeting held for the presidential anti-corruption Council.

The systemic roots of Russian corruption go back to the Nineties, when the collapse of USSR and the rapid transformation of the economic and political system have brought about poverty and the differentiation of income and assets among people. According

³⁴World Bank, *Doing Business Report 2016*

to a paper written by Manabu Suhara³⁵, the rapid institutional changes created a great void in the law. This allowed people to exploit loopholes in laws to accumulate private wealth. Moreover, organizations responsible for law enforcement, such as the police, and the law courts, did not perform their essential duties due to lack of budget.

If, since the Nineties the “new Russians” have become part of the Russian landscape, three elements has made it possible the persistence of this phenomenon: the absence of independent mass media, of political competition, and of an independent judiciary.

The most relevant effects of corruption result in the shadow economy taking an increasing share of the overall economy. Estimates about the impact of corruption on GDP ranges from 3.5% ³⁶ to 48%³⁷ according to the major international research centers. As Russian sources are thought to be overly optimistic, the “hidden sector” is likely to represent a very consistent part of Russian economy, which is, by definition, hardly quantifiable. In public finance, corruption also means reduced tax base, and waste of government resources. In the private sector, it leads to poor competition: the companies that succeed are not necessarily those that are the most effective, but those who have managed to gain certain favors from officials. While a very small portion of the population benefiting from the system, the rest must bear the costs. Thus, corruption is a risk displaying a very high likelihood, which materializes mainly in public services, healthcare and construction sectors.

However, corruption remains an endemic disease of Russian bureaucracy, at least until plurality of information and political competition will be enhanced, and jurisdiction will be independent from political power. It also has spill-over effects on other sectors. For instance, FDI flows are declining rapidly over the last two years: in 2015 FDI flows into Russia contracted by 92% compared to the previous year, as a result of geopolitical tensions with western countries, the sluggishness of bureaucracy, corruption and uncertainties about the rule of law. The table below shows that FDI inward flow has more than halved from 2012 to 2014 and the number of Greenfield investments has strongly contracted, although more recent estimates are not yet

³⁵ Suhara,M., *Corruption in Russia: an historical perspective*

³⁶ Rosstat, 2016

³⁷ World Bank, 2016

available. Growing political tensions could determine a further deterioration of FDI, whose share of GDP could fall well below the current level of 1.5%.

Table 3-FDI in figures

Foreign Direct Investment	2012	2013	2014
FDI Inward Flow (<i>million USD</i>)	50,588	69,219	20,958
FDI Stock (<i>million USD</i>)	514,926	565,654	378,543
Number of Greenfield Investments	328	283	178
FDI Inwards (<i>in % of GFCF</i>)	11.4	15.2	5.3
FDI Stock (<i>in % of GDP</i>)	25.6	27.2	20.4

Source : UNCTAD, 2016

In addition to these shortcomings, corruption could also trigger destabilizing events, such a popular discontent and social upheavals. To this end, political efforts have been undertaken: in 2009, several anti-corruption laws³⁸ were adopted by the Parliament, and others are about to come in 2016.

Another risk for Russian economy is represented by capital flight. It is “the transfers of assets denominated in a national currency into assets denominated in a foreign currency, either at home or abroad, in ways which are not part of normal commercial transactions”³⁹. An interesting academic paper undertaken in 1998 by the Institute of Economics, Moscow, and The Center for the Study of International Economic Relations⁴⁰ argues that capital flight too was a result of the move to a market oriented economy in the early 1990s. It was mainly due to the instability of the early transition period that was characterized by the dissolution of USSR and the

³⁸ One example of newly adopted anti-corruption law is represented by the Federal Anti-Corruption Law No. 273, which requires “companies operating in the country to implement anti-corruption compliance programmes containing specific anti-corruption measures”.

³⁹The definition is provided by a final report from a joint project on Capital Flight From Russia undertaken by the Institute of Economics, Moscow, and The Center for the Study of International Economic Relations, University of Western Ontario, Canada: *the problem of capital flight in Russia*

⁴⁰ Ibidem

dollarization of Russian economy. Capital flight is a very well-known phenomenon in Russian economy, which slowed down only during the economic boom of mid- 2000s. In 2014, it amounted to \$153 billion⁴¹, and directly translated in a consistent loss for the State coffers. Nevertheless, the phenomenon appears to be slowing down recently: capital flight in 2015 accounted to \$59 billion, according to the Central Bank of Russia. The shortcomings for national economy are represented by a loss in government revenues, as the country tax base shrinks and fixed domestic capital formation declines. In the last two years capital flight has intensified, as a consequence of political and economic instability. From January to October 2014, the Central Bank of Russia declared that capital flight amounted to over \$100 billion, which represents a consistent part of the Russian tax base. With a simple computation exercise, assuming a flat tax rate at 20%, we can assess that \$100 billion represent \$20 billion potential tax income for the government that is roughly 2% potential losses in terms of GDP. Capital flight brings about a further weakening of the ruble, as it consists in transferring national currency-denominated assets in foreign currency-denominated assets. This means a lower demand for national currency against foreign currency, which exerts downward pressure on the ruble price. Nevertheless, the dramatic reduction of two thirds in capital flight in 2016 compared to the 2015 levels, could be partially explained by a renewed confidence of Russian citizens confidence *vis-à-vis* their economic and political institutions is growing again.

1.6 PROSPECTIVE RISKS: DEMOGRAPHY AND TERRORISM

In addition to the previously analyzed five risks, one should also consider the so-called prospective risks, defined as risks related to long-terms trends that will not materialize soon, nonetheless the accurate analysis of a certain environment nowadays can reveal the future development and evolution of its core aspects in the long-term. Therefore, in order to perform a comprehensive risk analysis, it is crucial to focus not only on the

⁴¹Central Bank of Russia, 2016

most likely and impacting risks, but also on those risks that could show their effects in the long-term and that require a close and careful monitoring over time.

As far as Russian Federation is concerned, the major long-term risks, that the government in charge should pay attention to, are represented by demography and ethnic cleavages, these two being strongly connected.

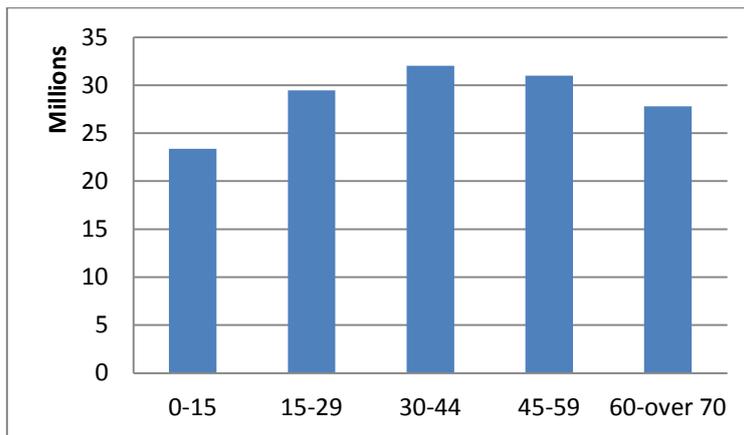
Demography is for Russia a serious issue to be addressed shortly. As any other Western and developed country, Russia has an ageing population, as fertility rate is falling skewing the population distribution towards to highest age groups.

Typically, ageing population brings about higher age-related public expenditures, as a growing part of GDP have to be devoted to services such as the payment of pensions and healthcare, thus diminishing the available resources for investments or any fiscal adjustments. This increase is partially counter-balanced by higher taxes, which drive down people income and thus lead to a shrink in private consumption and investments.

Currently, the overall fertility rate in Russia is about 1.7, whereas for a simple reproduction of the population, at least 2.1 is needed. Russia has already lost over 2 million people since 1992, when Russian population amounted to 148.6 million people, against 146.2 in 2015⁴². According to forecasts from the Russian Federal State Statistics Service, by 2030 natural losses will make about 11 million people. As roughly 35% of Russian population is over 50 years old (table 3), the economy could experience another shock in the mid-term, should fertility rates remain unchanged.

⁴² Russian Federal State Statistics Services, 2015

Table 3-Russian population by age groups



Source: Central Bank of Russia

Furthermore, in Russian territory there are many regions that are largely unexploited and uninhabited. If population keeps on shrinking, all these spaces will never deploy their potential, as no one will ever live in these territories and work to improve the infrastructures. Should not population experience any increase, a growing number of regions will remain under-developed, and this could seriously undermine the whole country's long-term economic development, that would thus rely uniquely on a few number of fast growing regions- namely the major cities' regions- regardless of the high growth potential ones.

An additional effort is required to fully understand the fertility dynamics of Russian population, which consists in breaking down the demographic trend by regions and ethnic groups. This approach highlights that population declines are being observed in regions inhabited predominantly by laic or orthodox Russians. Conversely, in Muslim majority regions population is growing rapidly, as the fertility rate is considerably higher. According to the projections of the Pew forum on religion and Public life, by 2030 Muslims in the Russian Federation will amount to 15% of the whole population, and by 2050 they should even exceed the others in number. Unless efforts will be made at an institutional level to foster integration and weld the different communities together, Russian demography could bring about religious and ethnic tensions in Russian historically uniform population. Russia is also subject to a massive immigration from Central Asian Republics (Kazakhstan, Tajikistan, and Kirghizia) that

flood a high number of non-qualified people on the job market. This exacerbates social differences between Russians, which generally have a high education level, and immigrants, that are most of the times only suitable for non-qualified jobs. This double cleavage, both ethnic and social, could burst into future tensions and undermine the country's stability.

In the past, ethnic tensions have also brought about social unrest in the form of terrorism. Since the nineties Russia has been exposed to Islamist terrorist attacks, perpetrated by separatists from the North Caucasus republics of Chechnya, Dagestan and Ingushetia, which claimed for independence from the Russian Federation. In that case, ethnic and religious claims combined with political claims, a situation that is still far from being resolved. At that time, the Government enacted questionable responses, sometimes crossing the limits of legitimacy. For instance, in 2004, when Chechen separatists took over 1,000 people hostage in a school in Beslan, North Ossetia, the Government refused to any form of dialogue or compromise. In the operation to end the siege, 334 hostages were killed, around half of them were children. Such ruthless behavior was at the time heavily criticized, but at the same time it probably contributed to eradicate the phenomenon. The terrorists faced a violent repression, with the Russian fearsome FSB on their footsteps, and eventually the threat was apparently gone.

The situation has been worsening over the past years: from the Caucasus radical Islam is spreading and gaining ground in some Muslim majority regions of the Federation, in which around 20 million Muslim are settled. In particular, radical Islam is getting a foothold in the Caucasian region, with Chechnya at the helm, where the cultural and religious difference combines with the struggle for independence. Caucasus plays an important role also at an international level, as in the Middle-East conflict, it represents an excellent source of foreign fighters recruited by the Islamic State to join the fight. This partially explains Russian hardly criticized interventions in the Middle-East, where it often clashes with European and American approaches. The political Islamist project perpetrated by the Islamic state could provide socially marginalized Russian Muslims with an ideological framework that legitimates their

claims for independence and/or any terroristic attacks to the territory of the Russian federation.

Unfortunately, the international environment is not going to change soon, as, apart from the Islamic State, Radical Islam has still a strong foothold in many regions, and this situation will probably remain unchanged until the Middle-East conflict will be resolved. For all these reasons, ethnic and religious tensions in Russian society currently represent a prospective risk, a risk that has not materialized yet, at least not recently, but that could represent a serious threat in the long term if the relevant authorities will not undertake sufficient efforts to prevent it.

1.7 POLITICAL STABILITY: THE LEADER'S UNSHAKABLE POPULARITY

Political stability in the Russian Federation requires a separate paragraph, as it is presumably the least likely to materialize, at least in the short and medium term. It is defined as the inability of the government to exercise its functions. Apparently, notwithstanding the current economic and diplomatic crisis, the approval rating of the President Vladimir Vladimirovitch Putin soared to 90% after the annexation of Crimea after a substantial drop to 63% in 2014⁴³. Surprisingly, not only did not the diplomatic isolation of Russia lead to social or political unrest in the country, but it also contributed to consolidate the Russians' feeling of encirclement from the International Community, which eventually strengthened national cohesion. According to a recently published paper of the Istituto Affari Internazionali⁴⁴, in 1989 only 13 percent of Russians believed that their country had external enemies; this view is now shared by 78 percent of Russian respondents. Popular support for the Russian leadership has

⁴³Levada Center, *The Economist*, 2016. The data also show that Putin's popularity has never been below 60% since 2000, when he was Prime Minister. His unshakable popularity dipped slightly to 60% only in 2004, after the Beslan school siege and in 2011, when Russian military intervention in Syria started.

⁴⁴IAI Research Papers, *West-Russian relations in the light of the Ukraine crisis*. This paper is the follow-up of an international conference on West-Russia relations jointly organised by the Istituto Affari Internazionali (IAI) and the Center on the United States and Europe (CUSE) of the Brookings Institution.

never been as strong as nowadays. The regime's control over media makes it easy for Russian leadership to ascribe the deterioration of the economy to the West, and to deflect blame away from its own economic mismanagement. On this issue writes Emma Ashford⁴⁵, research fellow at Cato Institute and, and suggests that "the sanctions are also having the perverse effect of enabling Putin to further consolidate his power, because he has rewarded his closest cronies at the expense of other elites. (...). It requires no great leap of logic to see that the Kremlin has shielded those with connections to the ruling circle from the pain of the sanctions, thereby shifting the burden to those without such ties". Indeed, what emerges from a deeper analysis of Russian political stability is that Putin's hold on power and popularity in Russia remain strong, despite circumstances that would normally mean a political disaster for any Western leaders. What a western – and external- observer struggles to understand is that Russians differs from Western people in many ways. Another interesting article on this subject, published by Steven L. Hall on Starford⁴⁶, suggests that traditionally Russians have always shown a strong predilection for stability, in the name of which they are ready to sacrifice wealth and what in the West would be considered as fundamental rights. This attitude is partially explained by an interesting trait in Slavic cultures that see suffering as a matter of national pride and, in this case, a way for Russians to stand up to an international community perceived as fundamentally anti-Russian.

Moreover, Vladimir Putin is seen by Russians as the first strong leader after the collapse of the Soviet Union, and this makes his popularity rather untouchable. His popularity is not going to be shaken soon. With a political environment largely uncompetitive, in a system that Andrei Kortunov, ISE Center, has described as "managed democracy" or "technocratic authoritarianism"⁴⁷, Vladimir Putin will probably be re-elected president of the Russian Federation in the next elections of March 2018. Kortunov also argues that the regime that Putin created over time in Russia is very similar to regimes created by other dictators in Latin America and parts

⁴⁵Ashford, E., *Not-So-Smart Sanctions The Failure of Western Restrictions Against Russia*. The paper also focus on the "unintended consequences" of sanctions, that will be further analyzed in the last chapter

⁴⁶Hall, L.S., *Putin's Russia is more stable than it seems*

⁴⁷ Dresen, J., *Putin's Russia Today: Sources of Stability and Emerging Challenges*

of Asia in the mid-twentieth century. It should be a source of stability because it produced economic prosperity and a certain degree of democratization during Putin's past tenure. However, Kortunov adds that Russia has been significantly less stable during Putin's second term: "administrative reforms have paralyzed the government, Russia's largest oil company was destroyed, unpopular reforms monetizing social benefits led to protests, and instability has proliferated in the north Caucasus"⁴⁸. At the same time, the economic well-being of Russians deteriorated as a consequence of the world economy's slowdown, low oil prices and the adverse diplomatic situation. According to many analysts, this combination could trigger people's discontent that could eventually ask for a radical change of the political leadership. This paper does not share this opinion, as it suggests that Russian popular stability currently is strictly connected with Putin's hands on the presidency. Rather, it should be probably considered as a prospective risk that will reveal its potential in the medium or long term, when Putin will not be allowed –for legal, constitutional or maybe health reasons- to be in power anymore and, with no other political alternative, the country will experience a serious political vacuum.

1.7 CONCLUSION

The qualitative risk assessment identified five major risks for Russian economy, which are strongly undermining the country's financial and economic stability. The sharp fall in oil prices, along with strained international relations due to a renewed military engagement in East Europe and the Middle-East, have revealed an intrinsic weakness in Russian economic structure. Its over-dependence on hydro-carbons that represent a consistent share of the country's GDP, and the vulnerability that arises from it are forcing the relevant authorities to adopt structural reforms aimed at boosting local production and fostering import-substitution. Furthermore, a high instability on financial markets puts pro-inflationary pressure on the currency, fosters capital flight

⁴⁸ Ibidem

and widespread corruption deteriorate public budget, make living conditions harder and hinder private investments in the country.

Prospective risks too require a very careful monitoring from the relevant authorities: the fact that their materialization is unlikely in the short and medium term does not stem their effects that could effectively prove extremely destabilizing in the long-term. Among all the potential threats the country could face, political stability does not appear. The unshakable popularity of Vladimir Putin exceeds expectations and makes its leadership steady in the medium-term. At most, political stability in Russia could be considered as a prospective risk, triggering its effects only once the current President will not be able to keep its hold on power anymore.

CHAPTER II

IMPLEMENTING THE VALUE-BASED ERM FOR COUNTRY RISK EVALUATION: PRE-MITIGATION FRAMEWORK

This chapter aims at quantifying risk in terms of its value impact. The focus will be on the two key risks –commodity and sanctions risk- over a timeline of fifteen years (from 2016 to 2031). To do so, it has been developed a financial model in the form of a spreadsheet-based tool that quantifies multiple deterministic risk scenarios for each key risk in terms of its potential impact on GDP. Risk quantification firstly involves the definition and computation of the baseline value when no risk event occurs. Secondly, it calculates the individual risk exposure for each risk. Thirdly, the combined impact of multiple risk scenarios is computed, taking into account risk interactivity. At the end of this chapter it will be possible to quantify the potential financial impact of individual risk events, as well as that of multiple simultaneous risk events, on GDP long-term growth.

2.1 GUIDELINES TO THE IMPLEMENTATION OF THE VALUE-BASED ERM

The starting point of this process is the baseline calculation, defined as the evaluation of the country long-term growth based on current expectations. As risk generally stands for any deviation from expectations, and expectations are in the specific case represented by the baseline value, computing the risk exposure involves the quantification of the shocks that impact any element of the model that contribute to the quantification of the baseline itself. As the relevant metrics is the country's GDP, defining the baseline scenario requires a breakdown into its four components- consumption, investment, government expenditures and net exports. Their relation is defined by the general formula:

$$GDP = C + I + G + NX$$

Where:

- Consumption equals the market value of all goods and services purchased by households
- Investments equal any changes to the physical stock of capital in the country
- Government Expenditure equals public spending in goods and services
- Net Exports equal the difference between foreign spending in domestic goods (Exports) and domestic spending in foreign goods (Imports).

Each of these elements has been in turn broken down into its sub-elements, which are the real transmission channels from the risk-event to GDP. Indeed, one risk will affect certain sub-elements more than others, and with different intensities than another risk. Quantifying these impacts gives a measure of GDP overall sensitivity to each risk.

Regarding the choice of the relevant metrics, many could argue that GDP is a questionable measure of the well-being of one country, although it still remains the most widely used indicator when it comes to measure its economic performance, as well as the most reliable indicator, being it consistently measured across all countries.

For the purpose of a more accurate analysis, it is crucial to consider also the annual variation of GDP over time, the compound annual growth rate, defined as the mean annual growth rate over a specified period:

$$CAGR = \frac{GDP_{2031}^{\frac{1}{16}}}{GDP_{2015}} - 1$$

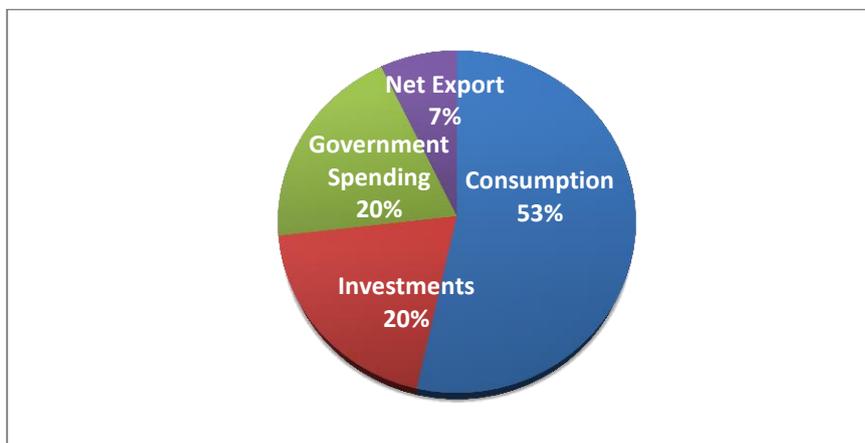
An additional remark is needed. This research attempts to identify GDP growth path over from 2015 to 2031. However, due to the lack of relevant documentation for 2015, GDP value in this year has been directly inferred from 2014 GDP (70,760 billion RUB) by applying the unanimously predicted contraction of -3.7% for year 2015. The model calculations are performed in Russian Ruble, as GDP is an aggregate measure of the national accounts. Had it been calculated in American dollars, it would not have taken into account the real growth/contraction because it would have been affected by exchange rate fluctuations⁴⁹. This does not mean that the model does not consider exchange rates and hence inflation rate at all, however computing GDP in rubles is much more appropriate to show the real growth rates of a non-dollar denominated country's GDP.

The chart below shows the share of each component in Russian GDP, as of 2014. As any other developed country, consumption represents more than 50% of total GDP-53%- while government spending and investments represent 20% of total GDP. Net exports represents only 7%, although it is the key factor that, in a largely undiversified economy, balances out domestic demand and supply for goods. These proportions will be useful check on the plausibility of the results arising from the development of the ERM model. It also helps understand why unemployment and depreciation of the currency played such an important role in Russian recession: they

⁴⁹ For instance, in 2014 GDP in dollar terms has been estimated at 1860\$ billion, while in ruble terms it was 70,760 RU billion. In 2015, GDP should amount to roughly 68,000 billion RUB, which corresponds to 1,100 billion USD at the current exchange rates. However, the percentage change between 2014 and 2015 GDP in dollar terms is far more than 3.7%, as it would amount to almost 45%, which is hardly credible.

both impact consumption, which is the main contributor of GDP. Affecting elements related to consumption means to impact directly more than a half of GDP value.

Figure 4-Composition of Russian GDP, 2014



Source: European Economic Forecasts

2.2 DEFINITION OF THE BASELINE SCENARIO: ASSESSING LONG-TERM GROWTH ACCORDING TO CURRENT EXPECTATIONS

This scenario is defined as the scenario when no risk event occurs, and when any expectation concerning GDP evolution is met. As risk is defined as *any* deviation from expected, it is therefore essential to define its principles.

First of all, the two main risks this paper focuses on concern commodity prices and international sanctions. These two parameters are indeed present in the baseline scenario and help define it. For instance, in the baseline oil prices have been set by taking into account recently published long-term estimates⁵⁰, which agree on growing oil prices at roughly 81-90\$ per barrel for the next decade. Based on these estimates, this paper assumes growing oil prices from the current levels-45\$ per barrel- to 90\$ per barrel by 2031. The in-between values have been inferred by using linear interpolation. As far as sanctions are concerned, recent economic literature expects them to be in

⁵⁰ Although the major Research Institutes' forecasts related to future oil prices do not diverge considerably, in this paper we have considered Deloitte's Resource Evaluation and Advisory Department that in March 31st published its *International forecasts*.

place until 2020 and then to be lifted thereafter. These two parameters are indeed part of the current expectations concerning Russian economy, as they directly impact some of the sub-elements defined by the model.

Figure 5- Baseline scenario assumptions

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Sanctions	x	x	x	x	x											
Oil prices	\$ 45	\$ 48	\$ 51	\$ 54	\$ 57	\$ 60	\$ 63	\$ 66	\$ 69	\$ 72	\$ 75	\$ 78	\$ 81	\$ 84	\$ 87	\$ 90

Once assumptions have been defined, it is crucial to identify the transmission channels on GDP components and hence, on GDP. Indeed, each component displays its own sensitivity to the analyzed risk, which is different from each other. Below is reported in greater detail the definition of each component and the way it is affected by the risk concerned.

CONSUMPTION. Consumption is the major contributor to GDP, accounting for over 50% of the total. By definition, it is the portion of the total annual income spent by households adjusted for inflation rate. Historical evidence shows that Russian inflation rate has always been medium-high thus deteriorating Russians’ purchasing power, and this trend is likely to continue for the next years, as the country’s currency is facing great pressure from financial markets. For what concerns the partition between income that is spent by households and income that is invested, it has been assumed a consumption rate of 75% of the annual real income, and a 25% investment rate⁵¹.

The annual real income is defined as the average nominal income adjusted for inflation. As a practical model also needs simplicity, we hereby assume that monthly income equals monthly salary. According to Rosstat⁵², Russian monthly average salary equals 62,000 RUB, and it is indexed on inflation every year⁵³, as declared by art. 134

⁵¹ Consumption and investment rates are commonly called respectively “marginal propensity to consume” and “marginal propensity to invest”.

⁵² Rosstat, 2015

⁵³ The model adds an adjustment factor of 1.5% to take into account of the Russians’ purchasing power growth after the steep fall of the last years

of the Labor Code⁵⁴. Inflation rate has been set according to the International Monetary Fund's own estimates, that assumes inflation rate to decrease to 5% by 2018 and then to stabilize at 4% thereafter.

The nominal annual salary is then adjusted for inflation through the Consumer Price Index, which measures changes in the price of a standard market basket of goods and services:

$$\text{Real annual income} = \text{nominal income} * \frac{CPI_{\text{year } x}}{CPI_{2015^{55}}}$$

The relationship between CPI and inflation is straightforward: inflation is the change in CPI from year x to year y. Therefore, CPI in year x is computed as follows:

$$CPI_x = CPI_{x-1} * (1 + \text{inflation rate}_{x-1})$$

The annual income captures any gain/loss in purchasing power by taking into account both the annual indexation and the adjustment for inflation.

In addition to the adjusted for inflation salary, the number of people that actually gain it should also be considered. Again, the Federal State and Statistic Service estimates that the working population in Russia amounted to 78M people in 2015⁵⁶. This number should be dynamic and capture any risk-event in Russian economy that impacts Russian employment, and hence, the number of working people. Working population, annual real income and consumption rate contribute to the definition of Consumption, according to the following formula:

Households Consumption

$$= \text{consumption rate} * \text{Annual real income} * \text{working population}$$

⁵⁴ Art. 134 Labor Code of Russia; Determinations of the Constitutional Court of the Russian Federation dated 17.06.2010 N 913-O-O and dated 07.17.2014, N 1707-O

⁵⁵ CPI in year 2015 has been provided by the World Bank, 2016

⁵⁶ Federal State Statistic Services, *Russia 2015. Statistical pocketbook*

In this scenario, consumption reaches 38,200 billion RUB in 2016 and grows to 51,800 billion RUB in 2031, which means 36% increase over time. In the long-term, such increase is driven by rather stable real salaries and an increase of employed people, as a result of next-to equilibrium oil prices. However, in the short-term domestic food prices move upward due to the sanctions system, putting additional strain on consumers' finance.

INVESTMENT AND GOVERNMENT SPENDING, OR EXPENDITURES. Investment is the sum of private and public investments. By definition, households' investment equals net-of-consumption income, according to the general formula:

$$\textit{private investment} = \textit{disposable income} * \textit{investment rate}$$

Where:

$$\textit{investment rate} = 1 - \textit{consumption rate}$$

This, according to the model, equals 25%.

Conversely, government investment is represented by public savings, or investments, as they are eventually re-invested for public good. Public savings are defined as the difference between Revenues and Expenditures, which can also be measured as a percentage of GDP (ratio Deficit/GDP). A quick look at the definition of Revenues and Expenditures is therefore needed.

As far as Revenues are concerned, they have been split into “oil revenues” and “non-oil revenues”. The latter are set at 10,500 billion RUB and increase by 3% every year. These estimates come from a recently published paper of the International Monetary Fund⁵⁷, which, based on historical evidence, states that non-oil revenues account for over 20% of GDP, that is around 220\$ bn over the past three years. This amount, multiplied by the current Dollar/Ruble Exchange rate of 0,015, returns a value which is close to what stated above.

⁵⁷ International Monetary Fund, *Russian Federation*

On the contrary, Oil revenues depend on crude oil prices. They have been defined as the sum of crude oil products and export duties on oil. Crude oil revenues are obtained as follows:

crude oil revenues

$$= \text{oil output per year} * \text{crude oil prices} * \text{tax rate} \\ * \text{Exchange rate}_{\text{RUB}}^{\text{USD}}$$

Where:

- the average oil output per year equals 3825,2M barrel⁵⁸
- the flat tax rate paid by Russian oil company equals 25%⁵⁹.

The Exchange in 2016 is set at 0,015 dollar per ruble and increase to 0,0235 by 2031. However, as shown in the first chapter, it is reasonable to think that the trend of the exchange rate, as well as Russian economic stability, depends strongly on the evolution of oil prices.

As far as export duties are concerned, they represent the share of revenues resulting directly from energy exports:

$$\text{export duties} = \text{energy exports} * \text{excise rate}$$

Here the excise rate has been set at 15%⁶⁰.

Then, Crude oil revenues and export duties sum up to Oil revenues, which, together with Non-oil Revenues, sum up to Government revenues that increase from 15,500 billion RU to 22,250 billion RU. For Russian public finance the threshold of 80\$ per barrel is very important, as it indicates the equilibrium between Revenues and Expenditures. These estimates are confirmed by Finance Minister Anton Siluanov's own declarations, as well as by ING Bank NV's own estimates of May 2015, which

⁵⁸ U.S. Energy Information Administration.

⁵⁹ Ernest&Young, *Taxation in the Russian oil sector*

⁶⁰ Rosstat, 2016

state that Russia needs at least 80\$ per barrel to balance its budget ⁶¹. It is also a good indicator of Russian sensitivity to oil prices and of the state of the economy for every level of oil prices. According to this model, government budget is close to equilibrium once oil prices reach 75\$ per barrel, which is consistent to what mentioned before.

As far as Expenditures are concerned, they represent the total purchase on goods and services of political authorities, excluding any spending on welfare projects or on infrastructures. They are divided into Fixed Expenditures and Defense Expenditures. The federal budget of 2014⁶² shows that in 2014 Defense Expenditures amounted to 2,500 billion RUB and that the remaining expenses summed up to 12,500 billion RU. The latter have been assumed to grow at 2% per year, while the former are based on the “new version of the country’s defense industry complex development program for 2016-2020”.⁶³ This version has been conceived in order to face the current military campaigns Russia is engaged in, thus allocating an additional 1,670 billion RU for Defense by 2020. Through linear interpolation we obtained the Defense Expenditures between 2015 and 2020. Thereafter, military expenses decrease by 2% per year.

As a conclusion, the function of Expenditures in national accounting is twofold: not only is it one of the four components of GDP itself, but, together with Revenues, it is also one of the determinants of public savings and thus, of public investment.

NET EXPORTS. Net Exports are defined as Exports – Imports.

As far as exports are concerned, they have been divided in two categories: energy and non-energy exports. The latter being an exogenous variable set at 12,000 billion RUB according to the International Monetary Fund’s own estimates⁶⁴, energy exports are instead an endogenous variable calculated as the sum of oil exports plus gas exports. According to Russian statistics, oil exports account for 70%⁶⁵ of total oil production and the rest is refined locally. Therefore:

$$oil\ exports_x = 70\% * oil\ output * oil\ prices_x * Exchange\ Rate_{USD}^{RU}$$

⁶¹ Ummelas, O., Andrianova, A., *Russia Bows to Cheap Oil as Putin Aide Sees \$50 Price for Budget*

⁶² Rosstat, 2015

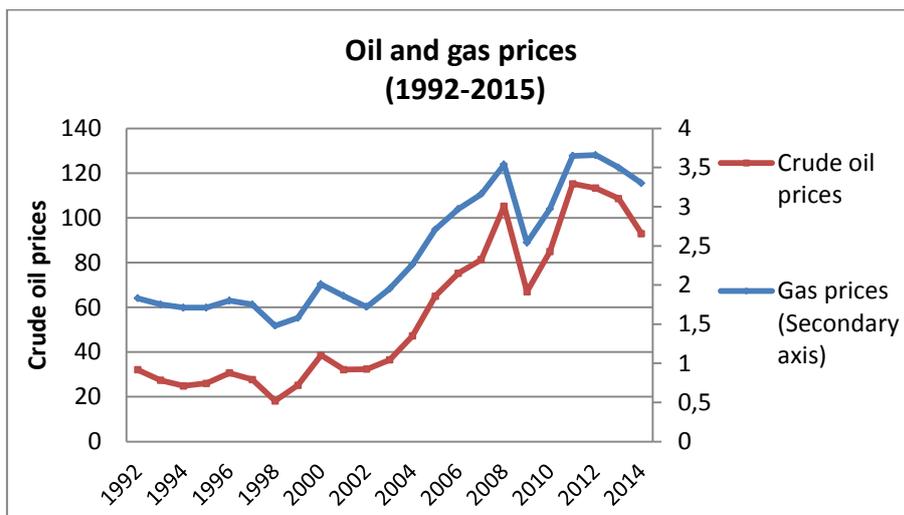
⁶³ TASS, *Renewed program adopted for Russian defense industry for 2016-2020*

⁶⁴ International Monetary Fund, *Russian Federation*

⁶⁵ Rosstat, 2015

In theory, the same applies to gas exports, which also account for 70% of total gas output (73,810,000,000 Gigajoule per year). However, when it comes to multiply gas output by gas prices, an additional step is required, as they are to be inferred directly from the model. Indeed, historical evidence suggests that they are strictly related to oil prices (chart below).

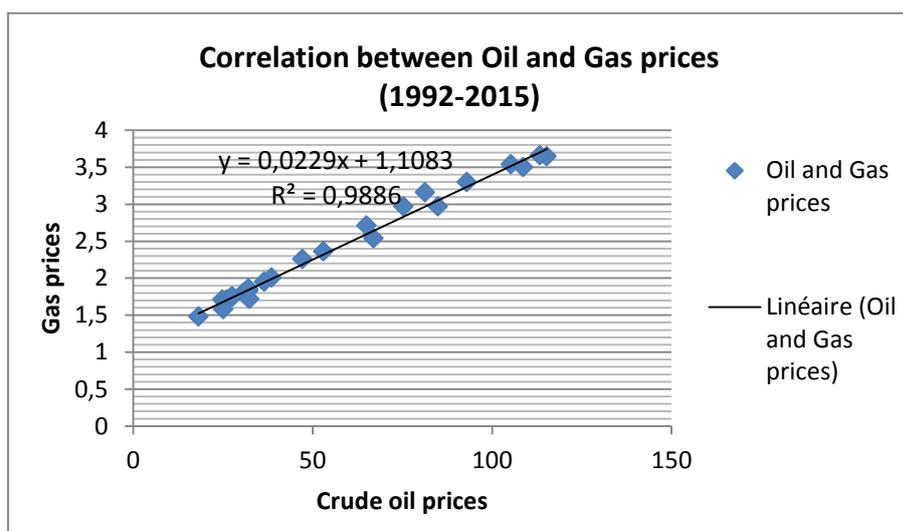
Figure 6-Historical values for oil and gas prices



Source: US Energy Information Administration

This allows for a fair estimate of gas prices assuming oil prices as an independent variable. Based on the previous chart's data, gas prices have been linearly regressed on oil prices for the period 1992-2015. The result is a very strong correlation, with $R^2 = 0,9886$. The linear regression also returns a function with an intercept of 1.1083 and inclination of 0.0229.

Figure 7-Correlation between oil and gas prices



Source: author's own estimates

Therefore, gas prices have been set as a dependent variable of oil prices, calculated as follows:

$$Gas\ prices_{USD} = 1,1083 + 0,0229 * oil\ prices_{USD}$$

Then, gas prices expressed in dollars are to be converted in Rubles according to the current exchange rates, which are an endogenous variable of the model.

The baseline scenario also takes into account the impact of sanctions on Exports. A recently published article of Anastasya Nevskaya ⁶⁶ shows that in 2015 Energy exports to Europe decreased by 42% as a result of the current international tensions, which are “reflected most prominently in the trade statistics on agricultural goods”. According to her, they “have been directly affected by the administrative barriers that arose as a result of Russian counter-sanctions”.⁶⁷ For the purpose of the correct development of our model, exports are decreased by a certain amount every year depending on the fact that sanctions are in place or not. For instance, when sanctions are in place, exports to Europe are decreased by 40%, while where sanctions are not in place exports limitations decrease by 15% every year. This means that exports to Europe are restored

⁶⁶Nevskaya, A., *Russia-EU economic relations: Assessing two years of sanctions*

⁶⁷ Ibidem

in 5-6 years from the sanction relief. This specific modeling takes into account the disruptive effect of sanctions in the short-term as well as the medium-term adjustment to reach the pre-sanctions level. As a result, exports equal oil and gas exports minus the sanctions' decrease on exports, sum up to Exports.

As far as imports are concerned, they have been generally set at 20,000 billion RUB. These estimates come from the extension to the entire model timeline of the International Monetary Fund's own estimates, according to which imports amount to roughly 300 billion dollars in the period 2015-2017. However, imports are affected by sanctions as well. When sanctions are in place imports are decreased by 2,145 billion RUB, while they are decreased by a zero-factor once sanctions have been lifted. This number is representative of the trade loss due to the ban on food imports, arms and dual-use goods⁶⁸. It shall also be considered that, as the Russian economy is highly dependent on the transfer of technology from abroad, the sanctions' most dangerous threat comes from the ban on dual use goods that could seriously reduce growth in the long run, as the German Institute for Economic Research suggests in a recently published paper⁶⁹. The author adds "It remains a question of whether the West is prepared to wait until the sanctions start to have an impact on the economy and thus lead to reshaping the course of policy."⁷⁰

Indeed, not only is it hard to quantify the effects that the ban on dual-use goods will have on Russian economy, but also the model is not conceived to extend to such a long period, as the effects on restricted dual-use trade would be visible in more than 20 years.

2.3 BASELINE SCENARIO: MAIN FINDINGS

This scenario assumes that crude oil prices gradually increase to 90\$ per barrel by 2031 from the current level of 48\$ per barrel.

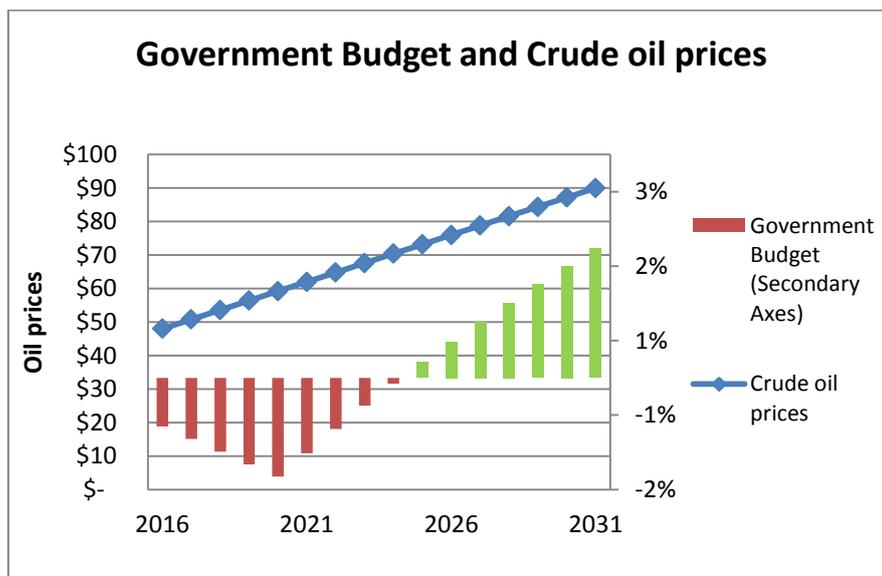
⁶⁸ Agriculture and rural development statistics, 2015 and the Economic Report published by the World Bank in April 2015.

⁶⁹Kholodilin, A.K., Netsunayev., A., *Crimea and Punishment: The Impact of Sanctions on Russian and European Economies*

⁷⁰ Ibidem

Government revenues draw maximum benefit from this increase, going up from 15,100 billion RUB to 22,250 billion RUB in 2031. The biggest part of this increase is due to higher oil prices and, hence, oil revenues, which increase by 75%. The same trend applies to Expenditures that exceed Revenues in 2016 -15,500 billion RUB- and then grow to 20,500 billion RUB at the end of the period, which means 30% increase against 43% increase in revenues. As a consequence, at the beginning of the period government runs a 0.7% deficit that gradually decreases over time and turns positive in 2025, when oil prices equal \$75. At the end of the period, with oil prices at 90\$ per barrel, government budget reaches +1.8% of GDP-1,750 billion RUB.

Figure 8-Government Budget over time. Baseline Scenario



Source: author’s estimates

The chart shows that government deficit widens in years 2019-2020. This is due to growing military expenditures, which increase until 2020 and then gradually decrease, as well as to oil prices lower than \$60 per barrel, which burden revenues.

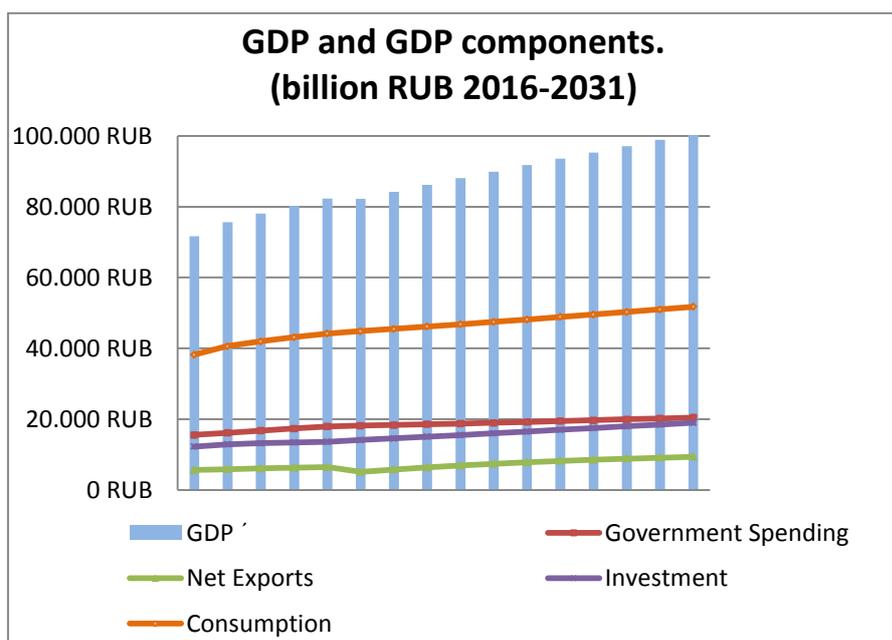
However, in relative terms growing oil prices stabilize Russian economy and contribute to the ruble appreciation, which boosts Russians’ purchasing power. Thus, Russians’ ruble-denominated real income grows from 54,500 RUB to 73,700 RUB per month.

This increase is the direct consequence of low and rather stable inflation. Indeed, this benefits households' consumption and investment, the former growing from 38,200 billion RUB to 51,800 billion RUB and the latter from 12,700 RUB billion to 17,300 billion RUB over the analyzed period.

The impact of higher oil prices is also significant for Net Exports. This is mainly due to increasing energy exports over time from 11,700 billion RUB to 14,800 billion RUB- accounting for over 45% of total exports at the end of the period. However, it should be considered that exports are decreased by a certain amount due to international sanctions expected to be in place until 2020. Therefore, exports increase from 20,300 to 26,200 billion RUB that is a 30% increase over time. It should be highlighted that, despite significantly increasing oil prices from \$45 to \$70 per barrel, energy exports are partially offset by a stronger ruble, which makes Russian exports less competitive and foreign imports more affordable. Imports are also affected by international sanctions that reduce the number of items imported from Europe and thus pushing the price of certain goods upwards. This means that imports amounts to 1,785 RUB as far as sanctions are in place and then grow to 2,000 RUB, once they are lifted.

As a result, net exports more than double from 3,100 billion RUB to 7,500 billion RUB over time. More broadly, such a low value for exports at the beginning of the period is due to current expectations concerning the persistence of sanctions and low oil prices for another five years. Once sanctions are lifted and oil prices start growing again, Russian balance of trade quickly outreaches its pre-crisis levels.

Figure 9-Growth of GDP and its components over time. Baseline scenario



Source: author's own estimates

The contribution of each component to GDP is the following: Consumption 53-55%, Investment 18-19%, Expenditure 22-20% and Net Exports from 6-7% of GDP. These shares are consistent with the Russian GDP structure in 2014.

In particular, consumption is the main driver of growth, as it accounts for over 50% of GDP. Restored confidence in Russian economy means stronger ruble and more generous salaries, which drives Russians' purchasing power up, increasing private consumption and investment. The latter maintains a consistent share of GDP, although the persistence of international sanctions in the next five years hinders more serious investment projects, due to restricted access on western financial markets. Conversely, the share of Expenditure slightly decreases over time, as the other components grow at a faster pace. For the next five years expenditures are expected to remain high compared to revenues, which then outreach expenditures bringing about consistent budget surpluses. The reason for high expenditures in the next five years is due to the allocation of a considerable amount to military expenses, which is approved in advance and thus confers rigidity to the budget. Net exports also see its share increase from 5.5% to 7.6%. This is mainly due to two factors: growing oil prices,

which allow for higher export revenues, and sanctions lifted in 2020, which restore trade with the European Union, especially for what concerns trade in the energy sector. According to this scenario, GDP grows from 68,141 billion RUB in 2015 to 100,652 billion RUB in 2031 that is a 48% growth in 16 years. On a yearly basis, this growth means 2.5% CAGR, which is consistent with the OECD's forecast of 2.5%⁷¹ annual growth in the long-term. Therefore, despite current low oil prices and international sanctions effects, Russia is arguably on the road to recovery. Current economic distress is a consequence of specific adverse economic and political situation, which presumably will not persist any longer than five years.

2.1 COMPUTING THE INDIVIDUAL RISK EXPOSURE FOR COMMODITY RISK

Commodity risk is defined as any deviation from average expectations concerning oil- and- in light of the high correlation- gas prices. It includes both downside and upside risk, defined as unexpectedly persistent low oil prices or rather beyond the expectations high oil prices. As shown below, in all of the three scenarios oil prices are expected to grow, although to a different extent.

Figure 10-Crude oil prices per barrel according to each scenario

Scenario	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pessimistic	\$ 40	\$ 42	\$ 43	\$ 45	\$ 47	\$ 48	\$ 50	\$ 52	\$ 53	\$ 55	\$ 57	\$ 58	\$ 60	\$ 62	\$ 63	\$ 65
Baseline	\$ 48	\$ 51	\$ 54	\$ 56	\$ 59	\$ 62	\$ 65	\$ 68	\$ 70	\$ 73	\$ 76	\$ 79	\$ 82	\$ 84	\$ 87	\$ 90
Optimistic	\$ 55	\$ 60	\$ 65	\$ 70	\$ 75	\$ 80	\$ 85	\$ 90	\$ 95	\$ 100	\$ 105	\$ 110	\$ 115	\$ 120	\$ 125	\$ 130

These assumptions are based on a recently published paper of the International Energy Agency, which shows that crude oil prices will reach higher levels by 2018, driven up by a sharp increase in oil demand that balances out and exceeds oil supply from then on⁷². Indeed, the current oil prices are well below the average of the past fifteen years and clearly do not represent the long-term equilibrium price. Thus, it is

⁷¹ OECD forecast at 2005 PPP, 2016

⁷²International Energy Agency, *Medium Term oil market report*.

reasonable to think that they will substantially increase compared to the current levels, although this will probably occur in the long-term. In this regard, the International Energy agency highlights that “unless we see an even larger than expected fall in non-OPEC oil production in 2016 and/or a major demand growth spurt it is hard to see oil prices recovering significantly in the short term from the low levels prevailing at the time of publication of this report. It is very tempting, but also very dangerous, to declare that we are in a new era of lower oil prices. But at the risk of tempting fate, we must say that today’s oil market conditions do not suggest that prices can recover sharply in the immediate future – unless, of course, there is a major geopolitical event”⁷³. Therefore, it is reasonable to assume a limited growth in the short-term, while in the long term oil prices could potentially outreach the pre-crisis levels. In the pessimistic scenario, prices increase by 62% over time and reach 65\$ per barrel at the end of the period⁷⁴. Conversely, the optimistic scenario assumes oil prices recovering to the golden era of oil producer countries, when oil prices reached 125-130\$ per barrel and those countries experienced huge budget surpluses.

After defining risk outlines, it is crucial to identify the value drivers of the model that are directly affected by the oil prices variable and thus represent the transmission channels from the risk-event to the relevant metrics. Below are reported the factors and mechanisms that define the sensitivity of GDP to oil prices:

- Exchange rate. As Russian economic stability is strongly related to oil prices trend, commodity risk impacts exchange rates too. Therefore, in the pessimistic and optimistic scenarios exchange rate respectively increases and decreases by 0,001 compared to the baseline.
- Oil revenues. Growing oil prices means growing revenues for government budget, which, at a certain point in time depending on the scenarios, exceeds expenditures and thus benefits public investment

⁷³ Ibidem

⁷⁴ In order to obtain prices over time, first of all oil prices at the end of the period have been set, and then the in-between values have been inferred by using the linear interpolation

- Energy exports. Again, growing oil prices means higher exports in oil and gas, whose prices are strongly related to oil prices. Through this channel, oil prices directly affect net exports
- Working people. Oil and gas industry represents a consistent part of Russian economy and is therefore among the top employers in the country. High oil prices encourage investments in the oil sector, and a higher number of people is hired to work in the plants. Conversely, low oil prices entail a lower profitability for such investments, pushing firms towards firings and plant disposals⁷⁵. As a consequence, working people are respectively 2% lower and 2.5% higher for the pessimistic and optimistic than in the baseline.

Under pessimistic assumptions, oil prices remain at record low for the whole period, thus having disruptive effects on Russian economy. Indeed, low oil prices determine a considerable loss in revenues for Government Treasury, where oil revenues generally account for 30-35% of total revenues. Unprecedentedly low oil prices -such as 40\$ per barrel in 2016- dramatically reduce oil revenues to 25% of the total. At the same time, Expenditures higher than Revenues determine persistent deficit from -1.5% of GDP in 2016 to 0.2% of GDP at the end of the period. In this scenario, low oil prices annihilate public investments for most of the analyzed period and retard infrastructure projects that are deemed necessary for the country development. Such low oil prices also compromise private consumption and investment growth via the unemployment channel: lower oil prices directly translate into a lower number of working people. Nevertheless, a stronger ruble negatively impacts net exports, making exports less competitive and imports more expensive. As a result, trade balance is close to equilibrium at 846 billion RUB. If one considers that Russia has benefited from a significantly positive trade balance (+8%, 5%, 4% of GDP respectively in 2005, 2006 and 2007)⁷⁶ before the financial crisis, this is indeed a very

⁷⁵ This approach has been developed by Nabila Zaman, in her Master Thesis “Do Oil Price Shocks Affect Household Consumption? -Evidence from 5 OECD Countries”, where she shows that in net oil exporting countries any decrease in oil investments profitability directly and negatively impacts consumption via the unemployment channel

⁷⁶ Rosstat, 2015

bad result. Growing oil prices temporarily restore confidence on Russian economy, increase energy exports and strengthen the government budget over times. This undermines the further widening of government deficit, bringing the budget close to balance and limiting investment crunch. The shares of consumption, investments, expenditures and net exports in GDP are respectively 53-55%, 18%, 18%, and 6%. Thus, the share of net exports slightly decreases from 8% to 6% at the end of the period. Consumption remains stable while investments and public expenditures diminishes, respectively as a consequence of weak confidence on Russian economy and austerity measures needed to cope with considerably lower oil revenues.

Oil prices remain too low to display high growth rates: over time, GDP increases by 31% -from 61,142 to 93.271,45 RUB billion RUB- which means a sluggish 1.98% CAGR over 7,000 billion RUB.

Under optimistic assumptions, oil prices are expected to gradually recover to pre-crisis levels by 2026. According to this scenario, crude oil prices are 55\$ per barrel on average in 2016 and reach 130\$ per barrel in 2031. This means that oil revenues sharply increase and hence, government revenues, bringing about consistent budget surpluses (3.5% of total GDP) to be devoted to public investments. As mentioned above, this level of budget surplus is close to the pre-crisis levels.

Higher and more stable oil prices also benefit private consumption: as confidence of financial markets is restored, the demand for domestic currency increases, which determines inflation slow-down and Russians' purchasing power augmentation.

The benefits of high oil prices in a natural resource-based economy concern most importantly exports of core natural resources, namely oil and natural gas. As an increase in oil prices entails a linear increase in natural gas prices, the optimistic scenario sees Energy exports significantly increase. As a result, with Imports set at 16,875-20,000 billion RUB Net Exports grow by more than 130%. The shares of consumption, investments, and expenditures in GDP are respectively 50%, 21%, 15%, while net exports dramatically increase from 8 to 13% at the end of the period. The share of public expenditure decreases, although it is counter-balanced by an equal increase in investments, which shows that the country's stability is perceived as real by financial markets and by foreign and domestic companies that start re-investing again.

In this scenario, Russian GDP grows from 68,142 billion RUB in 2015 to 110,007 billion RUB at the end of the period. This means a fifteen-year growth of +63% and a compound annual growth rate of 3.11% over the period, which is actually its pre-crisis level. Below is shown the individual risk exposure for commodity risk in table-form.

Figure 11-Individual Risk Exposure: Commodity Risk (billion RUB)

<i>Scenario Description</i>	<i>Probability</i>	<i>GDP 2031</i>	<i>Delta from Baseline</i>	<i>Growth over time</i>	<i>CAGR</i>
<i>Pessimistic</i>	20%	93.271 RUB	- 7.379,79 RUB	36,9%	1,98%
<i>Baseline</i>	65%	100.651 RUB	- RUB	47,7%	2,47%
<i>Optimistic</i>	15%	111.156 RUB	10.504,33 RUB	63,1%	3,11%

This table presents the individual risk exposure related to commodity risk. These findings show that downside and upside commodity risk can produce considerable fluctuations along the baseline value. For instance, according to the pessimistic scenario Russian GDP yearly growth over time is 0.5% lower than in the baseline, while in the optimistic scenario it is 0.64% higher. Over time, GDP grows by 37% in the pessimistic scenario and 63% in the optimistic scenario. These growth rates correspond respectively to -10% and +15% cumulative growth loss/gain compared to the baseline value.

The second column of Figure 11 shows the probability assigned to each scenario. To the baseline value a probability of 65% has been assigned, considering that the likelihood that this scenario occurs is higher than 1:2. For the other scenarios, so far it seems unlikely that oil prices will peak 130\$ per barrel in the next fifteen years, considering the current geopolitical framework. Therefore, to the optimistic scenarios it has been assigned a slightly lower probability than the pessimistic one. In order to combine the assigned likelihood and severity of the risk, it is also considered the expected value of GDP in 2031 that gives a measure of the center of the distribution of the variable. The table below shows the expected value of GDP in 2031, as well as the standard deviation from baseline and from the expected value itself.

Figure 12- Summary statistics for Commodity risk in 2031 (billion RUB)

<i>Baseline</i>	<i>100.651,24 RUB</i>
<i>Expected Value</i>	<i>100.750,93 RUB</i>
<i>St.Dev from Baseline</i>	<i>5.238,65 RUB</i>
<i>St.Dev from Exp. Value</i>	<i>5.238 RUB</i>
<i>Range</i>	<i>17.884 RUB</i>

The expected value shows the average value of GDP in 2031 for all of three scenarios weighted for their probabilities, which have been previously assigned. The standard deviation from baseline, which measures the dispersion of GDP values compared to the mean (baseline in this case), shows a moderate volatility of the data set ($\pm 5.2\%$) and proves the importance of commodities in the Russian economy. The same applies to the expected value of GDP in 2031 and its long-term volatility, which amounts to $\pm 5\%$ as well. The last row of Figure 12 displays the range, which measures the difference between the value of GDP in 2031 according to the optimistic scenario and the one in the pessimistic scenario. The range could be considered as another measure of volatility, displaying the difference between the highest and the lowest value.

Based on these results, it can be assessed that the impact of unexpectedly low or high oil prices on Russian GDP long-term growth is considerable. Yearly growth rates among the three scenarios can differ from 0.5% to 1.2% and the range between pessimistic and optimistic GDP in 2031 represents almost 20% of the baseline value. Moreover, our estimates are based on a linear path concerning oil prices, which ensures a certain amount of smoothness over time. Should an energy shock occur at certain point in time for any geopolitical reason, the impact could be much more important. This is the main reason that should push the relevant authorities to implement structural reforms aiming at diversifying Russian economy, as it can bring about significant changes-both upside and downside- in Russian GDP growth path.

2.2 COMPUTING THE INDIVIDUAL RISK EXPOSURE FOR SANCTIONS RISK

Sanctions risk identifies any extension or reduction of the period during which international sanctions are expected to be in force. For instance, in the baseline scenario it has been assumed that sanctions would be in place until 2020 and lifted afterwards. As any deviation from these expectations represents a risk, the pessimistic scenario assumes prolonged sanctions over time, while the optimistic scenario assumes sanctions to be lifted by 2018, as a result of a more conciliatory international climate.

Figure 13- Persistence of sanctions according to each risk-scenario

Scenario	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pessimistic	x	x	x	x	x	x	x	x	x	x	x	x				
Baseline	x	x	x	x	x	x										
Optimistic	x	x														

In particular, the pessimistic scenario assumes sanctions to be in force until 2027, well beyond the period identified in the baseline, as a consequence of strained international relations between Russia and Western countries. Contrasts related to conflicts' resolution in the Middle East, long-standing turmoil in Ukraine and further disagreements on other sensitive areas –such as Nagorno Karabakh- could make sanctions a long-standing issue for Russian and European economies.

In the optimistic scenario sanctions are prolonged until 2017 and lifted afterwards. Despite the diplomatic tensions, some European Russian-friendly countries – such as Greece, Italy and Hungary- could succeed in their struggle and convince other European countries to abandon the sanctions regime shortly. In this case, trade between the two parties could be restored and reach its pre-crisis levels quickly, and any significant efforts to boost domestic production could be further delayed. As well as for commodity risk, it is crucial to identify the transmission channels that spread the effects from the risk-event to GDP. For sanctions risk the transmission channels are represented by the following variables of the model:

- Defense expenditure. Sanctions are the direct consequence of strained relations with the West that arguably decides to leave the sanctions regime to punish Russian unwanted military presence in specific areas. Thus, additional defense expenditures increase, impacting government budget.
- Inflation rate, and hence, private consumption and investments. The pessimistic and optimistic scenarios assume inflation rates respectively 2.5% higher and 2.5% lower than in the baseline. This impacts CPI, and the people real disposable income.
- Imports and exports. Sanctions determine sort of trade barriers between Russia and the West, dramatically decreasing the trade flow between the two parties. On the one side, it restricts energy exports to Europe; on the other it limits exports.
- Working people. As sanctions limit business between Russia and the West, it also has an impact on firms' needs in terms of working force. Therefore, it has been assumed that for the pessimistic and optimistic scenario working people are respectively 1% lower and higher than the baseline.

It should be noticed that sanctions could pose a serious danger to Russia's future economic and industrial development through the prohibition of the supply of dual-use goods and technology for the exploration or production for deep-water, Arctic offshore, or shale projects that have the potential to produce oil in the Russian Federation. However, this variable is hardly quantifiable, as the effect of restrictions will be visible in the very long run, when the current technology will be obsolete and the purchase of new technology will be needed. Therefore, the effects that dual-use technology is not part of the model, as they would fall beyond its timeline.

Under pessimistic assumptions, prolonged sanctions means higher military expenses, which negatively impact the government budget and reduce public investments. The government budget is negative during the three quarters of the analyzed period, although it increases from -0.7% of GDP to 1% of GDP in 2031. Growing government budget determines an increase in public investments and thus in investments that rise by 50%. At the same time, prolonged sanctions cast a shadow on

Russian economic stability, thus increasing inflation by 2.5 percentage points compared to baseline. This deteriorates Russians' purchasing power and hence, private consumption and investments *via* a higher unemployment rate (+1% than in the baseline scenario). This slows down consumption growth (+32% against 36% of the baseline scenario) that could be the main driver of Russian short-term recovery.

Indeed, sanctions represent a diplomatic tool tailored to directly- and negatively-impact the country's trade exchange. They prohibits the provision of goods, services and technology related to the exploration or production of oil and gas, restricts the supply of military items. Russian counter-sanctions, in retaliation for Western sanctions, ban imports of food and agricultural products, which account for a consistent part of European exports to Russia. This decreases Russian exports and imports, thus driving the price of certain imported goods up and limiting Russians' purchasing power. This limits net exports growth, which increase by 24% less than in the baseline scenario. Over time, investments is by far the GDP component that is the most affected by the sanctions regime, as its share in Russian GDP increases from 17 to 19%, while consumption, net exports and public expenditures shares remain rather stable.

As a result, Russian GDP grows by 42% from 68,142 billion RUB to 96,585 billion RUB, with annual compound growth rate of 2.2% over time. This means that in the long-term sanctions lead to a cumulative output loss of 6%, that is 4,000 billion RUB less in fifteen years.

Under optimistic assumptions, sanctions are released shortly, thus restoring confidence on Russian economy. This has a direct impact on inflation rate, which decrease by 2.5% compared to the baseline scenario, and on employment (+1% than in the baseline), as Russian companies can start exporting again and experience a substantial growth, which benefits domestic employment. As a result, private consumption and investments increase (both by roughly 40%) while public investments do not experience any variation in the short-term due to the approval of the budget in advance, but they do in the medium and long-term (+20%). Expenditures in the medium and long term decrease as a result of the military disengagement, benefiting the government budget, which turns positive at the end of the period (+1.7% of GDP). Sanctions relief also brings about the abolition of current

trade barriers and boosts exports in the long-run. Freed from the sanctions' regime shortly, Russian trade balance displays a significant surplus in 2031- 9,800 billion RUB- which increases the share of net exports in GDP +9.5%.

As a result, GDP grows by 52.5% from 68,142 to 103,875 billion RUB, which means 2.7% compound annual growth rate over time.

Figure 14- Individual Risk Exposure: Sanctions risk (billion RUB)

<i>Scenario Description</i>	<i>Probability</i>	<i>GDP 2031</i>	<i>Delta from Baseline</i>	<i>Growth over time</i>	<i>CAGR</i>
<i>Pessimistic</i>	20%	96.584 RUB	- 4.067 RUB	41,7%	2,2%
<i>Baseline</i>	50%	100.651 RUB	- RUB	47,7%	2,5%
<i>Optimistic</i>	30%	103.875 RUB	3.224 RUB	52,4%	2,7%

Again, the table above shows the individual risk exposure for the sanctions regime. These findings show that sanctions risk is by far less troublesome than commodity risk for Russian economy. The difference in CAGR compared to Baseline is only -0.3% for the pessimistic scenario and +0.2% for the optimistic one. If prolonged sanctions lead to a cumulative output loss of 6% (-4,000 billion RUB), the abolition of the sanctions regime in two years from now leads to an output gain of only 5% (3,224 billion RUB). As well as for commodity risk, probabilities complete the picture by showing the likelihood correlated to each scenario in addition to severity. According to our model, there is one probability out of two that sanctions will be lifted in 2020 (baseline scenario), while the remaining 50% is split between the probability that sanctions will be lifted shortly (30%) and the probability that sanctions will remain in place for at least another 10 years (20%). Contrary to what stated for commodity risk, a higher probability has been assigned to the optimistic scenario rather than to the pessimistic one because it is reasonable to think that sanctions will be in force for the next years, although it is more likely that Russian-friendly European countries succeed in lobbying for the abandon of the sanctions regime than the opposite scenario in which sanctions are prolonged for another ten years. Indeed, the disagreement of some European countries *vis-à-vis* the sanctions regime is growing and the European Commission will probably no longer ignore it. Again, Figure 15 shows the summary statistics for sanctions risk.

Figure 15-Summary statistics for Sanctions risk in 2031 (billion RUB)

Summary Statistics	
<i>Baseline</i>	<i>100.651,24 RUB</i>
<i>Expected Value</i>	<i>100.804,97 RUB</i>
<i>St.Dev from Baseline</i>	<i>2.534,95 RUB</i>
<i>St.Dev from Exp. Value</i>	<i>2.530 RUB</i>
<i>Range</i>	<i>7.291 RUB</i>

In this case, the expected value of GDP in 2031 is slightly higher than the Baseline value, as a result of the higher probability assigned to the optimistic scenario.

The standard deviations from baseline and from the expected value show a low volatility of the data set ($\pm 2.5\%$), which indicates a modest fluctuation along the mean value (baseline or expected value). The Range measure supports these findings, displaying a 7,291 billion RUB variation between the highest and lowest value assumed by GDP in 2031, which represents roughly 7% of the baseline (against 17% for commodity risk)

As a conclusion, the model shows that sanctions certainly impact Russian economy in the long-run, although their contribution is not as important as oil prices. Apart from the shadows that sanctions can cast on Russian economy, they affect Russian economy mainly *via* net exports, and, although they do experience a significant variation, they account only for a small part of GDP—from 6% to 11%.

Therefore, prolonged or shortly lifted sanctions are likely to not have a disruptive effect on GDP long-term growth, as they are actually exacerbating an already difficult economic situation and are not responsible *per se* for Russian recession.

2.3 QUANTIFYING THE COUNTRY RISK EXPOSURE: RUNNING SCENARIO SIMULATIONS

The country risk exposure is the distribution of all potential impacts on the baseline scenario from one or more risk scenarios occurring at a time. To perform this calculation, it is crucial to consider the impact of risk interactivity, or correlation

between risk scenarios. Some risks are positively (negatively) correlated and are thus more (less) likely to occur together than the multiplication of their probabilities would otherwise indicate, and some are independent of each other (uncorrelated). For the two analyzed risks, we can assume an independence case, as they are largely uncorrelated. Falling oil prices are the result of market imbalances between oil supply and demand, while sanctions regime comes out from a political decision adopted by Western countries to contrast Russian military occupation of Ukraine.

The first step is to compute the combined probabilities that two risk scenarios occur at the same time.

Table 4- Combined probabilities, independence case

		Sanctions risk				Total
		Scenario	Pessimistic	Baseline	Optimistic	
Commodity risk	Scenario	Probability	20%	50%	30%	
	Pessimistic	20%	4%	10%	6%	20%
	Baseline	65%	13%	33%	20%	65%
	Optimistic	15%	3%	8%	5%	15%
	Total		20%	50%	30%	100%

In the right-hand column and in the bottom line the table shows the sum of the probabilities that a specific risk-scenario occurs together with another risk-scenario. Therefore, it can be noticed that the “Total” line and column actually shows the probabilities that had been previously assigned to the scenarios of the risk concerned.

In order to properly take into account risk interactivity, it is also crucial to determine the value drivers on which both risks intervene. Generally speaking, sanctions and oil prices impact different variables in the model, except for one: working people. The table below shows risk interactivity directly in the calculation of the working people for each scenario combination. The ability to see how multiple risk scenarios interact in terms of impact on risk drivers is a powerful aspect of the model.

Table 5-Combined impact on working people (billion RUB)

			Sanctions risk			
			Scenario	Pessimistic	Baseline	Optimistic
			<i>Working people</i>	77.220.000	78.000.000	78.780.000
Commodity Risk	Scenario	Working people	Deviation from Baseline			
	Pessimistic	75.660.000	-3,0%	74.903.400	75.660.000	76.416.600
	Baseline	78.000.000	0,0%	77.220.000	78.000.000	78.780.000
	Optimistic	80.340.000	3,0%	79.536.600	80.340.000	81.143.400

For the two analyzed risks the table shows working people as well as the deviation from baseline for each risk scenario. The square in the right-hand corner shows the joint impact on the variable of commodity and sanctions risks. The values have been generated by adding the deviations from baseline of the scenarios concerned to the baseline value for each combination.

The next step is to run simulations that show every possible combination of risk scenarios developed for the risks selected. Each simulation is run through the value-based ERM model to calculate its impact on 2031 Russian GDP. However, simulations have to be adjusted for the joint probability that the two scenarios occur at the same time. The likelihood of a simulation is calculated by multiplying the likelihood of each individual risk scenario in the simulation vector, assuming independence of all risk scenarios. The matrix below shows risk interactivity on Russian GDP value in 2031 and relates it to the probability that this occur:

Figure 16- Risk scenario simulations, independence case (billion RUB)

<i>Commodity Risk</i>			<i>Political Risk</i>			<i>Combined impact and likelihood</i>		
Scenario	Prob.	GDP 2031	Scenario	Prob.	GDP 2031	GDP 2031 Combined Impact	Joint Probability	Cumulated Probability
Pessimistic	20%	93.271 RUB	Pessimistic	20%	96.584 RUB	91.007 RUB	4,0%	4,0%
Pessimistic	20%	93.271 RUB	Baseline	50%	100.651 RUB	94.333 RUB	10,0%	14,0%
Baseline	65%	100.651 RUB	Pessimistic	20%	96.584 RUB	97.247 RUB	6,0%	20,0%
Pessimistic	20%	93.271 RUB	Optimistic	30%	103.875 RUB	97.273 RUB	13,0%	33,0%
Baseline	65%	100.651 RUB	Baseline	50%	100.651 RUB	100.651 RUB	32,5%	65,5%
Baseline	65%	100.651 RUB	Optimistic	30%	103.875 RUB	103.673 RUB	19,5%	85,0%
Optimistic	15%	111.156 RUB	Pessimistic	20%	96.584 RUB	107.812 RUB	3,0%	88,0%
Optimistic	15%	111.156 RUB	Baseline	50%	100.651 RUB	111.294 RUB	7,5%	95,5%
Optimistic	15%	111.156 RUB	Optimistic	30%	103.875 RUB	114.398 RUB	4,5%	100,0%

This table shows the severity and likelihood of each individual risk scenario, as well as severity and likelihood of the combination of multiple risk scenarios. The major contribution of this table is to show the cumulative probability that GDP in 2031 will reach a certain threshold. For instance, there is 4% likelihood that Russian GDP will not reach 92,000 billion RUB by 2031 and a 65% likelihood that it does not go beyond the Baseline value -101,651 billion RUB. The table enables a more accurate analysis, as it links cumulated probability with impact on GDP in terms of compound annual growth rate.

Figure 17-Combined impact on growth rates

<i>Commodity risk: scenarios</i>	<i>Sanctions risk: scenarios</i>	<i>GDP 2031 Combined Impact</i>	<i>Cumulated Probability</i>	<i>Growth rate compared to 2015 GDP</i>	<i>CAGR</i>
Pessimistic	Pessimistic	91.007 RUB	4,0%	34%	1,8%
Pessimistic	Baseline	94.333 RUB	14,0%	38%	2,1%
Baseline	Pessimistic	97.247 RUB	20,0%	43%	2,2%
Pessimistic	Optimistic	97.273 RUB	33,0%	43%	2,2%
Baseline	Baseline	100.651 RUB	65,5%	48%	2,5%
Baseline	Optimistic	103.673 RUB	85,0%	52%	2,7%
Optimistic	Pessimistic	107.812 RUB	88,0%	58%	2,9%
Optimistic	Baseline	111.294 RUB	95,5%	63%	3,1%
Optimistic	Optimistic	114.398 RUB	100,0%	68%	3,3%

According to this table, it can be assessed that over the next fifteen years Russian GDP has a 4% probability to grow at 1.8% y-o-y, and 65% probability to grow at less than

2.5% y-o-y, which is the CAGR resulting from the combination of the two baseline scenarios. Also, Russian GDP growth has only a 5% probability to reach its pre-crisis levels, when it was beyond 3% annual growth rate.

Another way of looking at the model is to stress the probability that GDP will fall short of expectations. For instance, there is 33% probability that Russian GDP in 2031 will be below the baseline value. Therefore, this table gives a measure of the confidence level in current expectations *vis-à-vis* Russian growth potential.

However, risk is measured as deviation from expected, where expected is defined as the perfect realization of the current expectations, and its GDP growth projections. Thus, it is crucial to measure the standard deviation from Baseline and from Expected value as the traditional measure of volatility, as well as the negative standard deviation from Baseline, which captures only downside volatility. Defining the negative standard deviation is important to our analysis, as it considers only the number of observation below the baseline. Of course, the higher the negative standard deviation, the higher the level of dispersion below the baseline. The formula for negative standard deviation is as follows:

$$\sigma_{downside} = \sqrt{\frac{1}{m} \sum_{y=1}^m (y - \bar{x})^2}$$

Where:

- m is the number of observations in the distribution that correspond to a result that falls short of baseline
- y a data point in the distribution that corresponds to a result that falls short of baseline expectations
- \bar{x} is the baseline

The table below reports the combined impact of multiple risk scenarios occurring at the same time as well as the standard deviations from Baseline and expected value and

the negative standard deviations of Russian GDP in 2031 as results from the scenario combination.

Figure 18-Quantifying volatility (billion RUB)

<i>Commodity risk: scenarios</i>	<i>Sanctions risk: scenarios</i>	<i>GDP 2031 Combined Impact</i>	<i>St.Dev From Exp. Value</i>	<i>St.Dev. From Baseline</i>	<i>Negative St. Dev. From Baseline</i>
Pessimistic	Pessimistic	91.007 RUB	4.165.216 RUB	3.720.635 RUB	11.274.651 RUB
Pessimistic	Baseline	94.333 RUB	4.730.786 RUB	3.991.857 RUB	12.096.537 RUB
Baseline	Pessimistic	97.247 RUB	942.800 RUB	695.253 RUB	2.106.826 RUB
Pessimistic	Optimistic	97.273 RUB	2.016.293 RUB	1.483.687 RUB	4.496.022 RUB
Baseline	Baseline	100.651 RUB	101.904 RUB	- RUB	- RUB
Baseline	Optimistic	103.673 RUB	1.182.032 RUB	1.780.845 RUB	- RUB
Optimistic	Pessimistic	107.812 RUB	1.307.293 RUB	1.538.484 RUB	- RUB
Optimistic	Baseline	111.294 RUB	7.624.990 RUB	8.495.411 RUB	- RUB
Optimistic	Optimistic	114.398 RUB	7.825.597 RUB	8.504.290 RUB	- RUB

These findings show that the upside-risk brings about a higher standard deviation from baseline and from the expected value compared to downside risk.

Below is shown the summary statistics for the country risk exposure, instead of individual risk exposures, as shown in the previous paragraphs.

Figure 19- Summary statistics for the country risk exposure in 2031 (billion RUB)

<i>Summary Statistics</i>	
<i>Baseline</i>	<i>100.651,24 RUB</i>
<i>Expected Value</i>	<i>101.211,20 RUB</i>
<i>St.Dev from Baseline</i>	<i>5.496,40 RUB</i>
<i>St.Dev from Exp. Value</i>	<i>5.467,81 RUB</i>
<i>Range</i>	<i>23.391,63 RUB</i>

The expected value equals the product of the joint probability vector and the combined impact of the two risks vector. Thus, it is the average value of GDP in 2031 weighted for the probabilities of each scenarios combination. Expected value is slightly lower than the baseline value, as a result of the higher probability assigned to downside

scenarios. The compound annual growth rate for both baseline and expected value is 2.5%, which translated in a 48% GDP growth over the analyzed period.

The two standard deviations, from Baseline and expected value, are measures of the volatility of GDP resulting from all the possible combinations of two risk scenarios. The range can be considered as another measure for volatility, as it shows the gap between the highest value of GDP in 2031 that arises from the combination of the two optimistic scenarios and the lowest value that arises from the combination of the two pessimistic scenarios. This value is quite high, as it represents 23% of the baseline. Indeed, such a high volatility indicates that the impact of the two risks combined is significant for GDP growth path. Moreover, the combination of the two Optimistic scenarios returns a 3.3% CAGR over time, while the combination of the two pessimistic ones returns 1.8% CAGR. This means that between the worst and the best combinations of risk scenarios there is a 1.5% compound annual growth rate loss. Indeed, countries display more limited growth (and contraction) rates than companies because they are far more stable entities. Still, for countries an output loss of 1.5% per year is rather considerable, as it turns into a 20% output loss compared to the optimistic/optimistic scenario combination.

2.4 CAPTURING RISK INTERACTIVITY: COUNTERBALANCING AND EXACERBATING EFFECTS

The value-based approach gives a clear picture of the individual exposure of each risk as well as of the combined impact of two risks. It is crucial to understand that risk interactivity should not be thought of just as the mere mathematical summation of the risk effects arising from individual risk exposures. Rather, risk interactivity captures the combined effects of two risks that can partially offset or exacerbate each other. This is the main difference between the combined impact, which takes into account any counterbalancing or exacerbating effects, and the aggregated impact, which simply sums up the deviation from baseline of the two risk scenarios. In this regard, it shall be noticed that when two risks determine opposite effects on the same value driver, they

engender what are commonly referred to as counterbalancing effects, which generally buffer the impact of those risks. However, two risks can also reciprocally exacerbate each other when they affect the same value driver and the nature of their impact occurs along the same lines. In the present case, the number of counterbalancing effects is limited, and is mostly related to their impact on net exports via export revenues and imports limitations. Lower commodity prices determine lower energy export revenues and hence, lower net exports. However, prolonged sanctions, in addition to export limitations, also bring about import limitations, which decrease the total amount of imports and thus benefit net exports. Thus, the interaction of the two risks tends to balance out, and the sum of the impact of the two risks is lower than the individual impact of each.

Apart from this example, the two key risks rather exacerbate each other through the joint impact on the following value drivers:

- Public investment *via* revenues and expenditure: commodity prices and sanctions intervene on this value driver through its two sub components. Commodity risk impacts public investments by respectively decreasing or increasing energy revenues, while sanctions affect it by increasing or decreasing military expenditures, and hence government expenditures. Therefore, the nature of the impact of the two risks on Russian budget (which corresponds to public investment) is the same, as they jointly contribute to deteriorate or rather strengthen it.
- Households' consumption and investment *via* the number of working people: Both commodity risk and international sanctions impact these drivers by reducing or boosting employment, which contribute to decrease or increase private consumption and investment. Thus, trends in oil and gas industry strengthens the impact of the international sanctions and vice versa, be it downside or upside.
- Net exports *via* energy exports and export limitations. Commodity prices determine a significant drop or rise in energy export revenues, and thus in net exports. At the same time, when sanctions are in place, they can engender

export limitations which apply to energy exports shipped to Europe, thus decreasing total exports and hence net exports. However, once sanctions are lifted, there are no export limitations able to reduce revenues arising from energy exports. Therefore, exports limitations strengthens the impact of commodity risk only in the downside scenario, while in the upside scenario it just lets commodity risk producing its positive effect on net exports without exacerbating them.

The prevalence of exacerbating over counterbalancing effects is evident once we analyze the ranges arising from the individual risk exposures.

Figure 20- Individual risk exposures and combined effect: sum-up (billion RUB)

IRE for Commodity risk		IRE for Sanctions risk		Combined effect
Scenario Description	GDP 2031	Scenario Description	GDP 2031	Range arising from scenario combinations
<i>Pessimistic</i>	<i>93.271 RUB</i>	<i>Pessimistic</i>	<i>96.584 RUB</i>	<i>91.006,77 RUB</i>
<i>Baseline</i>	<i>100.651 RUB</i>	<i>Baseline</i>	<i>100.651 RUB</i>	<i>100.651,24 RUB</i>
<i>Optimistic</i>	<i>111.156 RUB</i>	<i>Optimistic</i>	<i>103.875 RUB</i>	<i>114.398,39 RUB</i>

The minimum and maximum value identified for the two key risks' individual exposures risks is respectively 93,271 billion RUB and 111,156 billion RUB. Had the counterbalancing effects dominated the exacerbating effects, one would expect a lower possible range between the minimum and maximum value of the combined impact. Nevertheless, the range arising from the different scenario simulations is higher, swinging from 91,007 billion RUB to 114,398 billion RUB. This means that the joint effect of international sanctions and low commodity prices on Russian GDP over time is higher than the sum of the individual impact of each risk, and that the two key risks reciprocally exacerbate each other, thus contributing to the definition of a combined impact which displays a minimum and maximum value respectively lower and higher than what had been predicted by the individual risk exposures. These findings would confirm the position of the international and Russian press, which sees the current

adverse situation as a “perfect storm”⁷⁷ of unfortunate events that collude to further deteriorate the economic and financial performance of the country.

Compared to the aggregated impact, the combined impact is more reliable and returns a clear and comprehensive picture of the sensitivity of each variable to multiple risks occurring at the same time. When computing the joint effect of multiple risks occurring at the same time, the combined effect is by far a more realistic representation of the possible outcome, able to properly take into account risk complexity.

2.5 CONCLUSION

Risk quantification aims at measuring risk in terms of its long-term impact on GDP growth. It does so by using risk-scenario simulations that capture risk interactivity and provide with a clear picture of the overall impact of multiple risks occurring at the same time. The first step of risk quantification includes the definition of the individual risk exposures for the two key risks, commodity and sanctions risk. The results arising from the development of the model show that long-term GDP growth is affected by the two analyzed risks in different terms: the downside and upside volatility of Russian GDP along the baseline value is far higher for commodity risk than for sanctions. This process-step is also conceived as a way to check on the qualitative risk assessment results. In this regard, it shall be noticed that in the previous chapter the interviewees had identified sanctions risk as almost comparable in terms of likelihood and severity as commodity risk. However, the risk quantification shows a different picture, in which the impact of sanctions is way lower than the impact of commodity prices.

The second step consists in the definition of the country risk exposure, which shows the long-term impact that the combination of deterministic risk scenarios can have on Russian GDP growth. Running risk scenario simulations allows for a better understating of risk interactivity, as they also take into account the action of

⁷⁷ Becker, T. “Russia’s economic troubles – a perfect storm of falling oil prices, sanctions and lack of reforms”

exacerbating effects. These effects arise from the fact that the two risks exercise the same action on a certain number of value drivers, thus reciprocally exacerbating each other and increasing the volatility of GDP along the baseline value. The presence of these effects allows the international press and the relevant international research center to define Russian economic situation as a “perfect storm” where the joint impact of certain variables is higher than the individual sum of each impact.

In order to stabilize the country and reduce the impact of key-risks on GP growth path, structural and effective reforms aiming at diversifying Russian economy and boosting local production should be implemented shortly. The next chapter will discuss about these issues and the way through which the country can make better risk–return decisions that limit its exposure to the analyzed risks.

CHAPTER III

SUPPORTING POLICY DECISION-MAKING: HOW TO MITIGATE THE IMPACT OF KEY-RISKS

An important feature of the value-based Enterprise Risk Management consists in supporting decision-making by measuring the potential impact of key risks on both a pre-mitigation and post-mitigation basis. This process-step offers a clear “before and after” picture of the impact on value and on value volatility of the risk mitigation in question. In this chapter we will go through the measures and policies that Russian government should adopt in order to reduce the exposure to the analyzed risks. It could be considered as a policy advice on how to mitigate the effects of the risks that are currently proving disruptive for Russian economy.

Indeed, risk mitigation involves the reduction of both down-side and up-side risk, thus decreasing the volatility to the baseline value. By adopting the same approach of the second chapter, we will compute individual risk exposure for both risks and then the combined effect resulting from the mitigation process.

First of all, this chapter shows the new policies that should be adopted to reduce the risk exposure. Secondly, a new baseline scenario will be defined, as results from the risk mitigation process. Thirdly, the individual risk exposure for each analyzed risk will be defined. Finally, it will be computed the country exposure to the combined impact of commodity risk and sanctions risk. The chapter closes with a comparative analysis that weighs the consequences of the mitigation strategy and the *status quo*.

3.1 POLICY ADVICE AND IMPLEMENTATION: DIVERSIFYING THE ECONOMY AND FOSTERING NEW COMMERCIAL RELATIONS

The previous chapter clearly showed that the combination of the two key-risks brings about significant changes in GDP growth path. Such a high sensitivity of GDP to changes in commodity prices and in the structure of international relations should force Russian authorities to adopt effective reforms aimed at diversifying the economy, reducing its dependence on foreign imports and boosting local production. Indeed, Russian policy makers should first of all deal with a long-standing issue in Russian political economy: the over-dependence of the country on raw-materials, as the country's stability is deeply intertwined with the fluctuations of commodity prices, which are considered to be among the most volatile items on financial markets. Also, it is reasonable to think that the role of hydrocarbons in the world is declining. Although the transition to a low carbon global economy is likely to remain some decades away⁷⁸, renewables are gaining ground, especially among the most important customers of oil producer countries. In other words, the same countries that have for a long time been among the greatest hydrocarbons consumers are now shifting towards a more sustainable economy. This trend should encourage policy-makers to implement wide investments plans aiming at developing other sectors, which serve as buffer when energy prices collapse. In particular, the relevant authorities should focus on strengthening those sectors that, although not as competitive as oil, gas and mining and defense, still represent highly potential industries that are worth to develop such as the automotive industry, transport, road and agriculture machinery production, light and foodstuffs industries. In the long-term, these investments should correspond to an increase in the share of the aforementioned sectors and to a nearly equal decrease of oil and gas share in Russian economy.

⁷⁸ A recently published conference report by Wilton Patk, “New energy frontiers: what role for hydrocarbons in global energy security?” states that hydrocarbons will dominate the energy mix at least until 2035. After then the Institute, that collaborates with the International Energy Agency, expects the share of other sources grow to the detriment of hydrocarbon.

This re-orientation of the current industrial strategy should spill-over its effects on the import and export strategy. With oil and gas output reduced, exports related to the two commodities will decrease too, ideally replaced by non-energy exports. Such a shift from energy to non-energy exports would mean that Russia has achieved a competitive advantage in non-energy sectors over those countries that are currently exporting products to Russia. Of course, this conversion will take time, and any reform designed for this purpose should take into account long-term adjustments to reduce the share that hydrocarbons have in Russian economy. Thinking that Russia could abruptly move to a more sustainable economy –environmentally and economically- without gradually creating the conditions to reduce the country’s over-dependence, would be foolish.

Also, Russian authorities should attempt to reduce the country’s exposure to the sanctions risk through a re-orientation of their commercial policies. In particular, the country should probably start considering a shift in trade partners from Western countries to Asian countries, such as China or India that represent promising emerging markets with fast-growing populations and needs. Additional commercial opportunities could arise from renewed relations with the countries that were once part of the Soviet Empire and that are now part of the Eurasian Economic Community: Belarus, Kazakhstan, Kyrgyzstan, Tajikistan. Although these countries do not present the same potentiality as India and China, still integrating with them could be easier than the two Asian economic powers: Russian is still widely spoken by the local people of Belarus, Kazakhstan, Kyrgyzstan and Tajikistan, and the economies of these countries are still highly dependent on Mother Russia. Generally speaking, stipulating new commercial agreements with alternative partners would mean to diversify the risk and reduce the buyer power that European countries currently exert on Russia, and open to new international investors that could contribute to finance key-projects, such as the Siberia pipeline or other infrastructure projects. Diversifying Russia’s commercial routes could be crucial, especially if one considers that over the last years, Europe has continuously tried to diversify its energy supply, most of the times looking forward to agreements with the Gulf monarchies or the Caucasus countries (Azerbaijan above all). It would thus be reasonable for Russia to

stop relying on the 70%⁷⁹ share of energy exports that are currently shipped to Europe, because this share could abruptly decrease regardless of Russian intentions. The example of the Transatlantic Trade Investment Partnership, that is being negotiated between Europe and the United States, is quite representative of this situation. At the time of writing (September 2016) the Treaty is encountering great difficulties on the European side, however one of the reasons it was initially conceived was to reduce Europe's dependence on Russian hydrocarbons by providing Europe with an alternative oil source, represented by the United States' shale oil.

These reforms should reduce the country exposure to key-risks and more broadly, should also help reduce uncertainty over the ability of Russian economy to meet its obligations. Risk mitigation could represent a way for the country to turn risks into opportunities.

3.2 DEFINITION OF THE NEW BASELINE SCENARIO: BOOSTING DOMESTIC PRODUCTION TO THE DETRIMENT OF OIL AND GAS SECTOR

Dealing with the re-orientation of a country's economy proves a hard task that requires significant economic efforts and time to be completed. The main goals to be achieved in the medium and long-term include the implementation of domestic production and the shift in the import and export strategy. As far as the former is concerned, it can be achieved through higher government expenditures that help develop the domestic sectors not related to oil and gas. However, consistently higher expenditures bring about the widening of government deficit, which casts a shadow on Russian economic stability. Therefore, together with increasing fixed expenditures (+3% each year), inflation also increases by 1.5% compared to the pre-mitigation baseline scenario, swinging from 10% to 5.5% at the end of the period. At the same time, it is reasonable to

⁷⁹ Rosstat, 2015

think that expenses will be partially balanced out by higher non-oil revenues from 2020 onwards, which increase by 3% until 2020 and then by 5.5% each year ever since. This arises from the fact that higher investments will eventually strengthen other sectors of Russian economy to the detriment of oil and gas, whose revenues decrease over time. In the medium term, the newly established sectors will pay back the State for its investment in the form of taxes and excise duties. Therefore, non-oil revenues for post-mitigation baseline equal non-oil revenues in the pre-mitigation baseline until 2020. Then, they start to increase at an additional 2% per year ever since.

The diversification of Russian economy also involves a lower oil production, which decreases by 1% until 2020 and then drops by 3.5% from 2020 onwards. The dramatic cut in oil production occurring only in 2020 is due to the consideration that Russian economy needs time to re-adjust and cannot abruptly decrease the major contributor to GDP.

Nevertheless, what affects the most this baseline scenario is the shift in the import and export strategy. First of all, the new focus on domestic production brings about an increase in the share of non-energy exports of 1% each year compared to the previously computed baseline scenario. This share increases by an additional 0.5% after 2020 for the reasons mentioned before, representing 60% of total exports by the end of the period.

To this regard, one should consider that oil and gas exports currently represent more than 60% of total exports, and that the mitigation strategy would allow for a 20% shift from energy exports to non-energy exports in fifteen years.

Secondly, the model accounts for a reduction in the share of exports shipped to Europe, which decreases from 70% to 60% over time. This means that Russia will arguably look east to find new commercial partners, instead of relying on European suppliers or costumers, which have been searching for an alternative to Russian oil and gas for a while.

As a result, in the post-mitigation baseline scenario GDP grows by 47% from 68,141 billion RUB to 100,151 billion RUB, slightly lower (-0.7% over time) than the previously computed baseline value. This means that Russian GDP grows by 47% over time at 2.44% CAGR, instead of 2.47%.

The mitigation process generally involves a lower baseline value because mitigation has a cost. In the specific case, costs arise from the re-orientation of Russian economic strategy which requires massive public investments in domestic sectors and a contraction of the oil and gas sector that was until recently extremely profitable.

3.3 COMPUTING THE INDIVIDUAL RISK EXPOSURE FOR COMMODITY RISK: POST-MITIGATION FRAMEWORK

The same methodology of the previous chapter being applied, the number of scenarios defined for risk mitigation remains unchanged. In addition to the baseline, it shall be considered also a pessimistic and an optimistic scenario for the two analyzed risks. In order to mitigate the risk arising from commodity prices, the efforts pursued by the government aim at increasing the share of non-oil and gas items in the GDP computation to the detriment of oil and gas items. In other words, the share of non-energy exports increases significantly, while the share of energy exports decreases over time.

Under pessimistic assumptions, non-energy exports increase by 0.5% per year until 2020 and then by an additional 0.5% from then onwards. At the same time, while oil revenues drop over time non-oil revenues for government budget increases in the long-term. Mitigation also affects the unemployment rate, which widens, although to a lesser extent than in the previous chapter. Indeed, low oil prices involve firings and plant disposals all over the country due to the non-profitability of oil and gas investments. However, mitigation policies aiming at strengthening the other sectors provides with a buffer which decreases the impact of low oil prices on unemployment. Thus, instead of decreasing the number of working people by 3% compared to the baseline, it is decreased by only 1%. All these changes in the economic structure of the country raise some doubts on the country's economic stability in financial markets' perspective. The rethinking of Russian economic strategy, the re-orientation towards Asian partners to the detriment of

the well-established Western ones can make financial markets skeptical about the new trend. Therefore, it is reasonable to assume that the ruble will experience speculative attacks at the beginning of the period, and will be weaker than in the pre-mitigation pessimistic scenario. Following these considerations the exchange rate USD/RUB is expected to decrease by 0.0015 compared to the baseline scenario.

As a result, Russian GDP grows by 42% from 68,142 billion RUB to 96,675 billion RUB. In annual terms, this increase means a 2.21% compound annual growth rate over time, which is 0.23% higher than in the pre-mitigation scenario.

As far as the optimistic scenario is concerned, the share of non-energy items in the model grows at a faster pace. For instance, non-energy exports increase by 1.5% until 2020 and then by an additional 0.5% from then onwards. Also, the share of oil and gas exports decrease over time. If, according to the previous version of the model, the percentage of exported gas and oil revenues accounted for 70% of total exports, now it gradually decreases to 50% at the end of the period. As well as in the pessimistic scenario, non-oil revenues experience an increase in the medium term while oil revenues dip over time. The newly adopted mitigation policies benefit the number of working people, which increases by 1% and strengthens the Ruble, which is then perceived as rather stable on financial markets. This shift in strategy involves a dramatic decrease of oil revenues as well as of energy exports, which are currently the main contributors to GDP growth. As a consequence, Russian GDP grows by 51.7% over time, from 68,142 to 103,385 billion RUB. This corresponds to an annual growth rate of 2.64%, definitely lower than the 3.11% CAGR in the pre-mitigation optimistic scenario.

Figure 21- Individual Risk Exposure Mitigated for Commodity Risk (billion RUB)

<i>Scenario Description</i>	<i>Probability</i>	<i>GDP 2031</i>	<i>Delta from Baseline</i>	<i>Growth over time</i>	<i>CAGR</i>	<i>CAGR pre-mitigation</i>
<i>Pessimistic</i>	20%	96.675 RUB	- 3.476,54 RUB	41,9%	2,21%	1,98%
<i>Baseline</i>	65%	100.151 RUB	- RUB	47,0%	2,44%	2,47%
<i>Optimistic</i>	15%	103.385 RUB	3.234,29 RUB	51,7%	2,64%	3,11%

Now, the cumulative output loss or gain compared to the baseline is respectively 3,476 and 3,234 billion RUB, against 7,380 and 10,504 for the pessimistic and optimistic scenarios without risk mitigation.

The Figure below shows the summary statistics for commodity risk individual risk exposure. Compared to the pre-mitigation scenarios, the baseline and the expected value are lower respectively by 0.5% and 1%.

Figure 22-Summary statistics for commodity risk in 2031 (billion RUB)

<i>Summary Statistics</i>	<i>Post-mitigation results</i>	<i>% change compared to the pre-mitigation scenario</i>
<i>Baseline</i>	<i>100.161,88 RUB</i>	<i>-0,5%</i>
<i>Expected Value</i>	<i>99.951,68 RUB</i>	<i>-1%</i>
<i>St.Dev from Baseline</i>	<i>1.997,30 RUB</i>	<i>-62%</i>
<i>St.Dev from Exp. Value</i>	<i>1.335 RUB</i>	<i>-75%</i>
<i>Range</i>	<i>6.713 RUB</i>	<i>-62%</i>

However, mitigation has significantly reduced volatility: the two standard deviations are lower by 62% and 75% and the range by over 60% compared to the pre-mitigation framework. The standard deviation from the expected value show a very low volatility of the data set ($\pm 1.3\%$), which indicates an extremely moderate fluctuation along the mean value. The standard deviation from baseline is slightly lower, and it displays $\pm 1.9\%$ volatility around the baseline value. The Range is also significantly lower than in the pre-mitigation assumptions, where it amounted to 17,884 billion RUB.

These findings show that mitigation can dramatically decrease the country's exposure to the analyzed risk, through the diversification of the economy and the enhancement of all the sectors not related to oil and gas. This requires indeed significant efforts that can undermine the country's potential growth in the medium term. Mitigating the commodity

risk means preventing the country from experiencing 3.5% yearly contraction following historically low oil prices. It means to provide it with alternatives that make the country less prone to instability and uncertainty. And it means to reduce the dependence on foreign imports, which are subject to the course of diplomatic relations with other countries.

3.4 COMPUTING THE INDIVIDUAL RISK EXPOSURE FOR SANCTIONS RISK: POST-MITIGATION FRAMEWORK

Sanctions risk is mitigated through a re-orientation of commercial relations. The new approach arises from the consideration that the Russian key partner is not intended to release sanctions shortly, thus obliging Russia to look for valuable alternatives.

According to the pessimistic scenario, exports to Europe does not succeed in dramatically decrease the share of European exports. Over time, the share of exports shipped to Europe falls from 70% to 65%. Although weak, this shift in commercial partners benefits net exports in several ways: first of all, it helps diversifying the risk, making export trend more stable; secondly, the cumulative export loss of 5% over fifteen years is partially counterbalanced by a parallel reduction in those exports that are subject to ban imposed by sanctions. Also, the persistence of sanctions negatively affects the performance of energy exporting companies, which currently represent a consistent part of Russian companies and of Russian exporting companies. A shift in the export strategy of the country puts energy exporting companies in great difficulty, and thus impact employment. Therefore, the number of working people is 0.5% lower than in the baseline, as it is backed by the development of other commercial routes. Such a drastic change in Russian external politics cast a shadow on the country's economic stability, thus driving inflation up by 0.5% compared to the inflation rate and negatively impacting Russians purchasing power and hence consumption.

As a result, Russian GDP grows by 44.5% over time, reaching 98,459 billion RUB at the end of the period. In annual terms, this corresponds to a 2.33% compound annual growth rate, which is higher than the 2.20% CAGR in the correspondent pre-mitigation scenario.

According to the optimistic scenario, the diversification of the export strategy returns better results: the share of European exports decreases over time from 70% to 45%, and the share of exports subject to the sanctions regime contracts as well. The strategy also benefits employment, and the number of working people increases by 0.5% compared to the baseline scenario. The release of sanctions in the short-term and the newly adopted diversification strategy stabilize the country, thus reducing inflation of 0.5% per year compared to the baseline, benefiting private consumption and investment. Therefore, according to the mitigated optimistic scenario Russian GDP grows by a moderate 48.7% from 68,141 to 101,302 billion RUB, lower than 52.4% in the pre-mitigation optimistic scenario. This means a cumulative output loss of almost 4% compared to the correspondent pre-mitigation scenario. In annual rates, Russian GDP grows at 2.51% compound annual growth rate, instead of 2.61%.

Figure 23-Individual risk exposure for sanctions risk (billion RUB)

<i>Scenario Description</i>	<i>Probability</i>	<i>GDP 2031</i>	<i>Delta from Baseline</i>	<i>Growth over time</i>	<i>CAGR</i>	<i>CAGR pre-mitigation</i>
<i>Pessimistic</i>	20%	98.459 RUB	- 1.703 RUB	44,5%	2,33%	2,20%
<i>Baseline</i>	50%	100.162 RUB	- RUB	47,0%	2,44%	2,47%
<i>Optimistic</i>	30%	101.302 RUB	1.141 RUB	48,7%	2,51%	2,67%

For this risk, the cumulative output loss or gain of the pessimistic and optimistic scenario compared to the baseline is respectively 1,703 and 1,141 billion RUB, against 4,067 and 3,224 billion RUB for the correspondent scenarios without risk mitigation. It shall also be noticed that risk mitigation in this case has definitely achieved its purpose: the gap between the CAGR of the pessimistic and the optimistic scenario is 0.018%, which is absolutely negligible. It means that risk mitigation has dramatically reduced the gap between the down-side and the up-side risk.

Figure 24-Summary statistics for Sanctions risk in 2031 (billion RUB)

<i>Summary Statistics</i>	<i>Post-mitigation results</i>	<i>% change compared to the pre-mitigation scenario</i>
<i>Baseline</i>	<i>100.161,88 RUB</i>	<i>-0,5%</i>
<i>Expected Value</i>	<i>100.163,40 RUB</i>	<i>-1%</i>
<i>St.Dev from Baseline</i>	<i>985,09 RUB</i>	<i>-61%</i>
<i>St.Dev from Exp. Value</i>	<i>985 RUB</i>	<i>-61%</i>
<i>Range</i>	<i>2.844 RUB</i>	<i>-61%</i>

As well as in the previous case, baseline and the expected value are slightly lower, while volatility is considerably lower. In particular, the standard deviation from the baseline and the expected value is over 60% lower than in the pre-mitigation framework, the same applies to the range. The two standard deviations show an extremely moderate volatility of the data set ($\pm 1\%$) along the mean value. The Range is also significantly lower than in the pre-mitigation assumptions, where it amounted to 7,291 billion RUB.

Mitigation decreases the country’s exposure to the analyzed risk, although in this case the risk is less disruptive to Russian economy than the previous one. The mitigation occurs through a re-focus of the export strategy to the detriment of European partners that appear still reluctant to lift sanctions. The diversification of the risk would benefit the country’s stability, making it less sensitive to the European blackmailing and more open to emerging opportunities.

3.5 QUANTIFYING THE COUNTRY RISK EXPOSURE POST-MITIGATION: RUNNING RISK-SCENARIO SIMULATIONS

This chapter concludes with the analysis of risk interactivity on the country risk exposure. As shown before, probability distribution for each scenario remains unchanged,

as well as the correlation assumptions. Therefore the probability matrix used to weight the severity of each scenario for its likelihood is the same as in the previous chapter.

Following the same scheme, in order to properly capture risk interactivity the model computes separately the impact on those variables which are directly affected by both risks, such as the number of working people.

Figure 25-Combined impact on working people-Mitigated

		Sanctions risk			
		Scenario	Pessimistic	Baseline	Optimistic
Commodity Risk		<i>Working people</i>	77.220.000	78.000.000	78.780.000
		<i>Deviation from Baseline</i>	-0,5%	0,0%	0,5%
	Pessimistic	75.660.000	-1%	76.447.800	77.992.200
	Baseline	78.000.000	0%	77.220.000	78.780.000
	Optimistic	80.340.000	1%	77.992.200	78.780.000

In the mitigation process, the impact of the two analyzed risks is lower than in the previous chapter, where it amounted to $\pm 3\%$ for the commodity risk and $\pm 1\%$ for the sanctions risk.

After computing the joint impact of the two risks on the concerned variable, the next process-step is to run simulations that show every possible combination of risk scenarios developed for the risks selected. Indeed, each simulation is adjusted for the joint probability that the two scenarios occur at the same time.

The matrix below shows risk interactivity with mitigation policies adopted on Russian GDP value in 2031 and relates it to the probability that this occur.

Figure 26- Risk scenario simulations, independence case MIT (billion RUB)

<i>Commodity Risk</i>			<i>Political Risk</i>			<i>Combined impact and likelihood</i>		
Scenario	P	GDP 2031	Scenario	P	GDP 2031	GDP 2031 Combined Impact	Joint Probability	Cumulated Probability
Pessimistic	20%	96.684 RUB	Pessimistic	20%	98.459 RUB	96.366 RUB	4,0%	4,0%
Pessimistic	20%	96.684 RUB	Baseline	50%	100.162 RUB	98.040 RUB	10,0%	14,0%
Baseline	65%	100.162 RUB	Pessimistic	20%	98.459 RUB	98.478 RUB	13,0%	27,0%
Pessimistic	20%	96.684 RUB	Optimistic	30%	101.302 RUB	99.327 RUB	6,0%	33,0%
Baseline	65%	100.162 RUB	Baseline	50%	100.162 RUB	100.162 RUB	32,5%	65,5%
Baseline	65%	100.162 RUB	Optimistic	30%	101.302 RUB	101.460 RUB	19,5%	85,0%
Optimistic	15%	103.397 RUB	Pessimistic	20%	98.459 RUB	101.740 RUB	3,0%	88,0%
Optimistic	15%	103.397 RUB	Baseline	50%	100.162 RUB	103.434 RUB	7,5%	95,5%
Optimistic	15%	103.397 RUB	Optimistic	30%	101.302 RUB	104.743 RUB	4,5%	100,0%

Compared to the pre-mitigation simulations, the range of all the possible combined impacts on GDP is smaller. For instance, in the previous example the combination of two pessimistic scenarios returned 91,007 billion RUB, while the combination of two optimistic scenarios returned 114,398 billion RUB. This means that mitigation has reduced the range between the maximum and minimum value of the simulation by over 70%. As in the pre-mitigation framework, there is 33% probability that Russian GDP in 2031 falls short of expectations, although fluctuations along the baseline/baseline combination are significantly lower.

Figure 27-Combined impact on growth rates MIT (billion RUB)

<i>Commodity risk: scenarios</i>	<i>Sanctions risk: scenarios</i>	<i>GDP 2031 Combined Impact</i>	<i>Cumulated Probability</i>	<i>Growth rate compared</i>	<i>CAGR</i>
Pessimistic	Pessimistic	96.366 RUB	4,0%	41%	2,2%
Pessimistic	Baseline	98.040 RUB	14,0%	44%	2,3%
Baseline	Pessimistic	98.478 RUB	27,0%	45%	2,3%
Pessimistic	Optimistic	99.327 RUB	33,0%	46%	2,4%
Baseline	Baseline	100.162 RUB	65,5%	47%	2,4%
Baseline	Optimistic	101.460 RUB	85,0%	49%	2,5%
Optimistic	Pessimistic	101.740 RUB	88,0%	49%	2,5%
Optimistic	Baseline	103.434 RUB	95,5%	52%	2,6%
Optimistic	Optimistic	104.743 RUB	100,0%	54%	2,7%

This table shows the combined impact of risk scenarios on compound annual growth rate. It is complementary to the previous table, as this one shows the mitigation effects aiming at reducing potential losses as well as potential growth. In the correspondent table of the previous chapter the minimum CAGR amounted to 1.8% while the maximum equaled 3.3%. Now this range is reduced, and the gap between the worst and best combinations is only 0.5% annual growth.

Figure 28-Quantifying volatility post-mitigation (billion RUB)

<i>Commodity risk: scenarios</i>	<i>Sanctions risk: scenarios</i>	<i>GDP 2031 Combined Impact</i>	<i>St.Dev From Exp. Value</i>	<i>St.Dev. From Baseline</i>	<i>Negative St. Dev. From Baseline</i>
Pessimistic	Pessimistic	96.366 RUB	612.945 RUB	576.264 RUB	1.746.255 RUB
Pessimistic	Baseline	98.040 RUB	502.270 RUB	450.374 RUB	1.364.769 RUB
Baseline	Pessimistic	98.478 RUB	422.561 RUB	368.647 RUB	1.117.112 RUB
Pessimistic	Optimistic	99.327 RUB	54.598 RUB	41.832 RUB	126.762 RUB
Baseline	Baseline	100.162 RUB	4.597 RUB	- RUB	- RUB
Baseline	Optimistic	101.460 RUB	271.043 RUB	328.489 RUB	- RUB
Optimistic	Pessimistic	101.740 RUB	63.851 RUB	74.686 RUB	- RUB
Optimistic	Baseline	103.434 RUB	745.807 RUB	803.127 RUB	- RUB
Optimistic	Optimistic	104.743 RUB	895.931 RUB	944.331 RUB	- RUB

The table above shows the standard deviations for each scenario simulation. Compared to the correspondent table in the last chapter, volatility is significantly reduced, both up-side and down-side. For the combination of the two pessimistic risk scenarios, the negative standard deviation is almost halved compared to the correspondent combination of the pre-mitigation case.

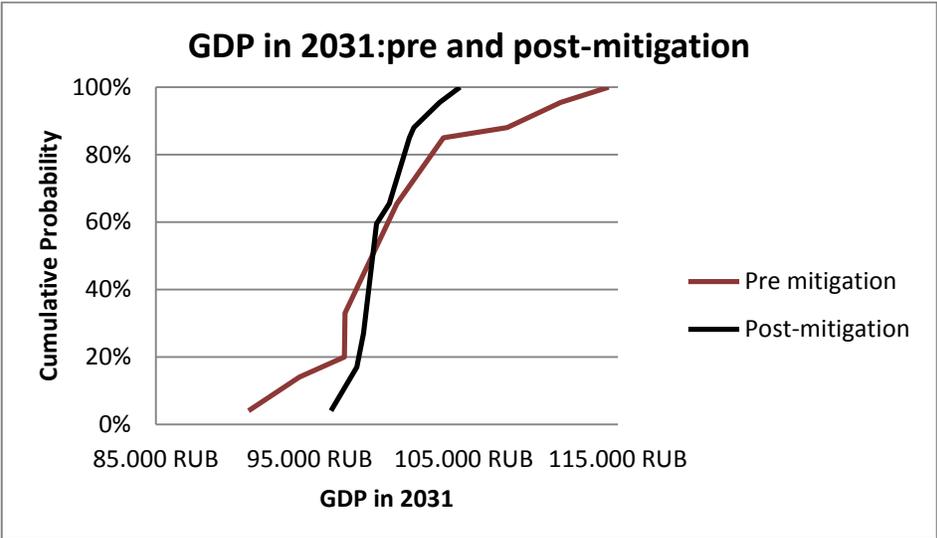
Figure 29-Summary statistics of scenario simulations in 2031 (billion RUB)

<i>Summary Statistics</i>	<i>Post-mitigation results</i>	<i>% change compared to the pre-mitigation scenario</i>
<i>Baseline</i>	<i>100.161,88 RUB</i>	<i>-0,5%</i>
<i>Expected Value</i>	<i>100.280,82 RUB</i>	<i>-0,9%</i>
<i>St.Dev from Baseline</i>	<i>1.894,14 RUB</i>	<i>-65,5%</i>
<i>St.Dev from Exp. Value</i>	<i>1.890,40 RUB</i>	<i>-65,4%</i>
<i>Range</i>	<i>8.376,56 RUB</i>	<i>-64,2%</i>

The summary statistics give a clear and comprehensive picture of the simulations related to the newly formulated assumption. The standard deviations from expected value and from baseline are decreased by over 65%, and the range between the minimum and the maximum value of the simulation is also significantly lower. The reduction of volatility is achieved to the detriment of the baseline value and the expected value, respectively 0.5% and 0.9% lower than in the pre-mitigation framework.

The graph below shows the Cumulative Distribution Function, which is the probability that the variable will take a value less than or equal x. Since the vertical axis is a probability, it must fall between zero and one. It increases from zero to one as we go from left to right on the horizontal axis. This figure clearly shows that in the post-mitigation framework the range of values GDP can take over time is lower, , but also that these values are slightly lower than their pre-mitigation counterparts. In particular, the set of values GDP can possibly assume according to every scenario simulation swings from roughly 96,000 to 104,000 billion RUB, against 91,000-114,000 billion RUB in the pre-mitigation framework.

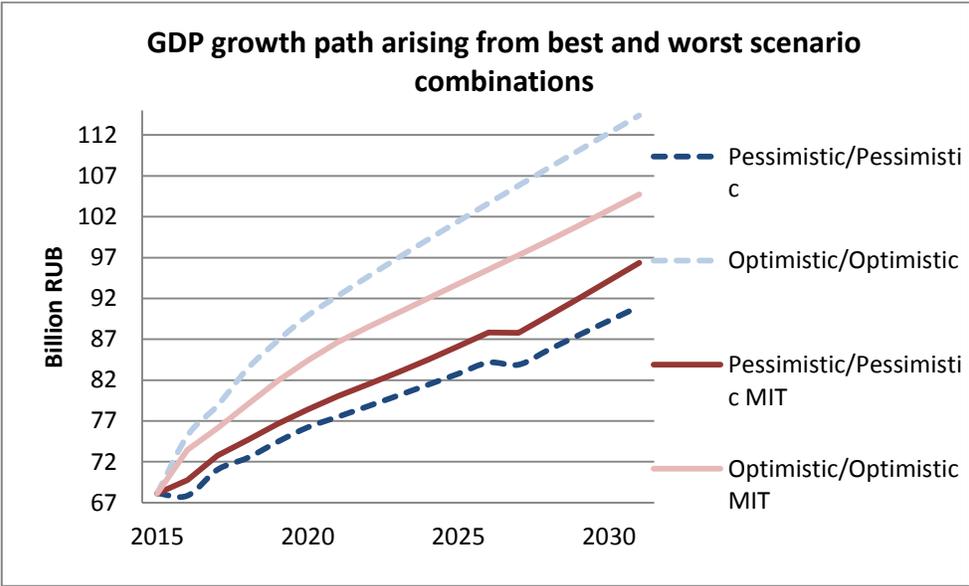
Figure 30- Cumulative Probability Distribution Function (billion RUB)



Author’s own estimates

Another way to look at the reduction in volatility is to show the possible outcomes in terms of GDP growth path arising from the worst and the best scenario simulations. In figure 31 it is no surprise that the external lines represent GDP growth path arising from Pessimistic/Pessimistic and Optimistic/Optimistic scenario combinations in the pre-mitigation framework, while the internal lines represent the same scenario combinations in the post-mitigation framework. The distance between the post-mitigation lines has been significantly reduced, and this also to the detriment of upside potential.

Figure 31- GDP growth path arising from scenario combination: PRE and POST-MITIGATION



Authors’s own estimates

3.6 CONCLUSION

This chapter aims at quantifying the effects that mitigation policies could eventually have on Russian economy. The combination of the two key risks, commodity prices and international sanctions, can have disruptive effects on Russian GDP long-term growth. This research suggests that the relevant authorities should start thinking about alternative strategies that reduce the country risk exposure. This can be achieved through the re-orientation of industrial and commercial policies that should go for a reduction of hydrocarbons share in Russian economy and closer relationships with China or India or the Eurasian Economic Union States, alternative partners to Europe.

When implementing the value-based ERM model to take into account the relevant mitigation policies, the results show a lower mean value of GDP at the end of the analyzed period but also a significantly lower volatility than in the pre-mitigation

framework. In other words, mitigation has a cost: not only does it decrease both upside and downside risk, but it also directly translate into a slightly lower growth over time.

Lower mean values (be them the baseline or the expected value) are the consequences of a higher instability due to the shift in Russian economic structure: apart from unprecedentedly low oil prices of the last years, hydrocarbons industry remains one of the most profitable ones and a resource-based economy going through structural reforms to change this aspect raises doubts as to whether the country can effectively manage a swing from a well-established and consolidated path to a difficult, uncertain in terms of result and long-term oriented approach. Effective risk mitigation policies would stabilize Russian economy and strengthen its structure, thus reducing its sensitivity to external shocks. Doubts concerning the adoption of such policies arise from the fact that historically Russia has strongly benefited from its upside risks, mainly by exploiting unprecedentedly high commodity prices on financial markets. Political decisions as to whether adopting structural policy to mitigate risk or not, should take into account the future trend in the global economy, such as the increasing role of renewables energies to the detriment of hydrocarbons and the rise of a new geo-political order.

FINAL CONSIDERATIONS

THE BENEFITS OF FORECASTING AND THE VALUE ADDED OF THE ERM MODEL

An often-quoted saying says: the only thing certain about forecasting is that it is always wrong. This approach points out that many processes simply cannot be forecasted appropriately, especially when one of the variables to be considered is represented by human behavior, which is hardly predictable. The main issue related to forecasting is that this activity is based on the assumption that the past predicts the future, as the analysis of past information should identify patterns and predict future trends. However, past trends could be different from future trends, as a result of unexpected events that change the predominant structure of a phenomenon. This uncertainty makes forecasting inaccurate, still the standard approach is to invest a great deal of time and resources in this activity because forecasting remains a powerful tool for decision-making. Typically, forecasting helps determine possible trends from the provided data and use the information to extrapolate what could happen in the future. This helps address potential needs before they grow to be unmanageable. This approach ensures that, despite the inaccuracy of most estimates, decision-makers are far better off with estimates, even highly subjective estimates, than with no quantitative information at all.

The model developed in this paper should not be thought of as a mere forecasting tool; rather it highlights the major trends of Russian economy and the relative impact of key-risks. Thus, it shows the primary role that commodities and international relations play in Russian economy, and which of these can have a greater impact on it. Long-term growth of Russian economy will probably not perfectly correspond to what predicted in this

paper, still the model provides with possible ranges showing the value that Russian GDP can take over time. These ranges can be considered as a measure of sensitivity to certain parameters, and always reveal useful information.

It is legitimate to wonder whether the value-based enterprise risk management model that is broadly used for the risk evaluation of a company can be generalized to non-corporate entities. Of course, non-corporate entities present additional challenges mostly due to the need of an alternative metrics to the discounted distributable cash flow. This requires some accounting adjustments, as the primary source to develop the model are the national accounts, instead of corporate accounts. Once the relevant amendments have been made, the advantages of the ERM are numerous.

First of all, it shows the main drivers of Russian recovery, as it highlights the transmission channels that are the most affected by each risk. Breaking down each component of the analyzed metrics –GDP- helps the relevant authorities to better understand what is the marginal impact of each risk on the transmission channels and, eventually, on GDP. Secondly, it captures risk complexity by showing both the downside and the upside potential of each risk. One should always bear in mind that risk can also mean opportunity, if it unlocks its upside potential. Therefore, especially when thinking about mitigation actions, it is crucial to identify the real trade-off between upside potential opportunities and downside potential losses, and between risk and return. Risk is uncertainty, but reducing uncertainty has a cost, which arises from the reduction of upside margins. The value-based ERM shows both upside and downside volatility and to what extent they can be reduced through mitigation policies.

Thirdly, it allows identifying the individual impact of each risk and then aggregating it to obtain the country risk exposure, thus taking into account any counterbalancing or exacerbating effects. In this way it is possible to fully and consistently quantify risk impacts because the model quantifies the impact of multiple risks occurring simultaneously and captures their interactivity—both offsets and exacerbations.

Finally, it provides a comprehensive and yet simple and practical approach to assess the real key-risks exposure. Focusing on a limited number of risks makes decision-making

effective, as it avoids an unnecessary analysis of risks whose impact would be negligible. Therefore, it can be argued that the ERM model is not less accurate for non-corporate entities than any other forecasting tool used for this purpose, these turning out to be equally misleading and inaccurate because of the very nature of forecasting.

What any decision-maker can do is to base her decisions on forecasting, because a world with wrong forecasts is better off than a world with no forecasts at all.

CONCLUSION

This paper was initially conceived to shed light on cause and effect of Russian undermined economic and financial stability. It turns out to be an interesting example of how the best practices of the private sector can be generalized also to those entities that do not operate for profit. More in general, this paper suggests an implementation of the widely known value-based Enterprise Risk Management that makes it able to identify, monitor and quantify the impact that key-risks can have on the distributable cash flow of a company as well as on the economic performance of a country. Through this tool, this research assesses the severity of the impact that commodity prices and the sanctions regime are having on Russian long-term growth. The results arising from the quantification process deserve some considerations.

Firstly, the impact of commodity risk is far more important than the impact of the sanctions regime and could seriously undermine Russian growth in the long-term. This is due to the poor diversification of the country's economic structure, largely dependent on the oil and gas sector. However, the future for this sector is not bright: the re-entry of Iran on international oil market and the lack of agreement among OPEC countries will put additional downward pressure on commodity prices, making energy a successful investment only for those countries that will be able to dramatically decrease the cost of production. Even lower oil prices arising from ruthless international competition are probably not compatible with the economic structure that has characterized Russia in the last decade.

Secondly, not only are sanctions only exacerbating a difficult situation that was essentially home-made, but they are also driving to paradoxical results: while they can have a certain

impact due to economic interdependence, they also undermine it, by inadvertently pushing the sanctioned country towards a higher level of economic independence. Imports substitution is already part of the government agenda and efforts to develop non-energy sectors are being undertaken. The major threat of sanctions arises from the restriction for European partners to sell dual-use technology, which is widely used for oil extraction and drilling. However, the ban will produce its effects in the long-term, when the current technology will become obsolete. Were sanctions to remain in place in the long-term, Russia should start producing its own technology or find alternative partners with a high level of technological advancement. This search could turn out to be not as easy as it seems to be, if one thinks that almost all developed countries, the only ones that today could provide Russia with dual use technology, have unilaterally adopted sanctions and embraced the ban.

Thirdly, the analysis of the country risk exposure sheds light on the interaction of commodity and sanctions risk. The fact that the combined impact of the two key risks on the country growth is higher than the sum of the two individual impacts involves the existence of the so-called exacerbating effects, which increase GDP volatility along the baseline value and strengthen upside and downside risk potential. These effects materialize when key risks impact the same value drivers, and the effect on those drivers occurs along the same lines. The existence of these effects explains the real drivers of Russia's recession, which arises not only from the adverse economic and political conditions, but also from the way they interact, as they mutually exacerbate each other.

Within this context, mitigation could strongly benefit the country's economic and financial stability. This paper also includes what could be considered a policy advice to the relevant authorities on how to decrease the potential impact of key risks. This is one of the assets of the value-based ERM, which supports decision-making by showing the effects of a possible mitigation on the relevant metrics. In this case, mitigation involves the diversification of the country's economic structure and the re-orientation of international and commercial relations. As far as the former is concerned, the relevant authorities should promote a reduction of hydrocarbons' share in Russian economy and the

development of non-energy yet high-potential sectors, such as the food industry, transport, road and agriculture machinery production, which would serve as a buffer when energy prices collapse. Also, the development of local production can reduce the over-dependence on foreign-imports and decrease the country's sensitivity to exchange rate fluctuations. The diversification of domestic economy is certainly what is needed the most, although the re-conversion of the "oil and gas station" model to a more sustainable and reliable one involves a long-term commitment. The need to undertake these efforts is further strengthened by future perspectives of commodity market, which will make investments in the field unprofitable for a while. Effective mitigation policies should also aim at reducing Russian over-dependence on European imports and at diversifying the customer base of its exports, the latter involving a shift in trade partners from Western to Asian countries. Over the last years, Russia engaged in closer relations with China, which in turn committed to invest in number of infrastructure projects in Russia, such as the Siberia pipeline. Also, China is becoming an important customer of Russian oil and gas, and could potentially replace Europe soon. Additional commercial opportunities could arise from stronger relations with Eurasian Economic Community countries, whose economies, as a souvenir of Soviet era, are still highly dependent on Mother Russia. Of course, mitigation has a cost, as it involves the reduction of downside potential losses as well as of upside potential opportunities, which, in favorable circumstances, can significantly boost the country's growth. Mitigation also involves a slightly lower growth over time, mainly due to disinvestments in the fundamental sectors of oil and gas and to uncertainty arising from the shift in Russian partnerships and the diversification of its economic structure: a swing from high-income and well-established partners to poorer developing countries, as well as the development of domestic production to the detriment of the until recently highly profitable oil and gas sector can raise some doubts about the ability of the country to effectively manage such a drastic change.

This paper confined itself to the analysis of two key risks, however the value-based ERM model can support complex risk simulations with a significantly higher number of risks and risk scenarios. For instance, one could extend this analysis to the additional three

risks identified in the qualitative risk assessment- currency, corruption and capital flight- and run additional risk-scenario simulations for the definition of the country risk exposure. Considering a higher number of variables means identifying more precisely the possible range of values that Russian GDP could have in the long-term. It could be argued that the value-based ERM is a mere forecasting tool, unable to predict future trends when base assumptions change over time. Nevertheless, the fact that the model succeeds in identifying a possible range of values for the chosen metrics, always reveals useful information regarding its sensitivity to the analyzed risk. The interest of the value-based ERM also lies in the identification of the transmission channels, which represent the mechanism through which risks interact with the relevant metrics, thus helping authorities to address any potential threats more effectively. Therefore, although potentially inaccurate because of the very nature of forecasting- not because of the inappropriateness of the tool itself- the value-based ERM provides with a robust and yet practical approach to determine the exposure to key risks of any entity, adapting itself to different kinds of metrics. The access to reserved data and the use of a more sophisticated software can extend the value-based ERM's potential applications even further and make it a real instrument of political economy.

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DEPARTMENT OF BUSINESS AND MANAGEMENT

Chair of Risk Management

SUMMARY

IS RUSSIA AN “OIL AND GAS STATION
MASQUERADING AS A COUNTRY”?
EVALUATING THE IMPACT OF OIL PRICES AND INTERNATIONAL
SANCTIONS ON RUSSIAN ECONOMY THROUGH THE
IMPLEMENTATION OF THE VALUE-BASED ENTERPRISE RISK
MANAGEMENT

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ACADEMIC YEAR 2015-2016

SUMMARY

INTRODUCTION

Over the last years, Russia has been confronted with multiple shocks arising from adverse trends in the global commodity market and from strained international relations with the West. In March 2014 the European Union adopted what have been considered as “restrictive measures” in response to the Russian annexation of Crimea and the burst of Ukraine conflict, followed by Russian ban of products and services provided by Europe, USA, Australia and Canada. This coupled with unprecedentedly low oil prices and the poor diversification of Russian economy, all circumstances that led to great uncertainty regarding the country’s future direction. As a consequence, the domestic currency experienced a steep depreciation, the fiscal balance dropped and foreign investments fell sharply. Russian purchasing power significantly decreased and unemployment widened, thus determining a strong contraction in domestic consumption, and hence, in the country’s GDP.

The strong recession Russia is undergoing recently has been defined as a “perfect storm”, which arises from the fact that the oil and gas sector represents a significant share of the country’s GDP and this hinders the development of other sectors, until recently considered as less profitable and not worth investing. The great importance granted to the energy sector has deeply conditioned the country’s economic strategy over time, which consists in exporting huge quantities of oil and gas and importing any other consumer goods from abroad. Such a poor diversification of Russian economic structure makes the country extremely vulnerable to external shocks, especially to those related to the energy sector.

Within this context, this paper aims at investigating and analysing cause and effect of the shocks Russia is experiencing through the adoption of the value-based Enterprise Risk Management, the process through which companies identify, measure and manage key risks one entity can be confronted with. Spreading economic, financial and political instability across the world has raised global awareness of the need of an integrated approach to managing risks, irrespective of the very nature of the concerned organization. So far, the idea of monitoring risks and quantifying their potential impact has only been employed for corporate entities, thus linking the notion of Risk management only to those organizations that operate for profit. The purpose of the present paper is to implement the value-based Enterprise Risk Management, so that it can be generalized to a non-corporate entity and, in the present case, used to scrutinize and quantify key risks arising from the current political and economic situation of Russian Federation. It represents a valuable tool able to quantify the impact of these risks according to current expectations as well as to measure the effects of a possible mitigation action aiming at reducing the country risk exposure. Of course, the adoption of this model for a non-corporate entity requires number of adjustments, mainly related to the choice of the relevant metrics, on which it is possible to quantify risks in terms of their value impact. For the purpose of this analysis, we have considered GDP and its compound annual growth rate as the metrics that identify the country exposure to commodity and sanctions risk. The model provides with a comprehensive approach that shows both the impact of each individual risk on the metrics and the combined impact of all key risks together, thus fully capturing any counterbalancing or exacerbating effects arising from the risk interactivity. At the end of this research it is possible to gain a deeper understanding of the underlying dynamics of Russian recession as well as of the possible ways to tackle with it.

CHAPTER I. IDENTIFYING RUSSIAN POTENTIAL THREATS: A QUALITATIVE ANALYSIS OF THE COUNTRY'S ECONOMIC AND SOCIAL LANDSCAPE

This chapter represents Risk identification, a qualitative analysis aiming at identifying the major risks for the country. The starting point of risk identification is represented by the Risk Identification and Categorization tool, a list which includes risk categories, risk subcategories, risk divisions, the risks themselves, and a definition clarifying the scope of the risk. This categorization should be reasonably comprehensive in terms of categories and subcategories. This list represents the input of the following step, the qualitative risk assessment, through which it is possible to narrow down the number of risks to focus on. The aim of the qualitative risk assessment is to prioritize and rank the list of major risks according to their likelihood and severity. This process-step involves the participation of a certain number of survey participants, who are asked to assign qualitative scores to the likelihood and severity of each risk. The result of the data aggregation of all the interviews together is a list of five risks, generally considered as more disruptive to Russian economy. Interviewees identified as the two key-risks commodity prices and the persistence international sanctions, while the remaining three- currency, corruption and capital flight-represent additional risks to be monitored over time because they could become key-risks soon.

The chapter also focuses also on long-term risks, the – the so-called prospective risks. These are demography and ethnic cleavages, which are strongly correlated. On average, Russia has an ageing and declining population as a consequence of its low fertility rate. However, population declines are being observed in regions inhabited predominantly by laic or orthodox Russians, while in Muslim majority regions population is growing rapidly, as the fertility rate is considerably higher. Unless efforts will be made at an institutional level to foster integration and weld the different communities together, Russian demography could bring about religious and ethnic tensions in Russian historically uniform population. In the past, Russia has already suffered from this kind of issues: since

the Nineties, the country has been exposed to Islamist terrorist attacks, perpetrated by separatists from the North Caucasus republics of Chechnya, Dagestan and Ingushetia, which claimed for independence from the Russian Federation. In that case, ethnic and religious claims combined with political claims, a situation that is could spread to other territories of Russian Federation, especially in light of the last international events, where Islamic fundamentalism is gaining ground in many regions, from the Middle-East to Central Asia.

Although not identified as a major risk, the first chapter also investigates the risk arising from political stability. Despite what Western press says, popular support for President Putin and Russian leadership has never been this high. This is due both to the diplomatic isolation of Russia of the last years, which has contributed to consolidate Russians' feeling of encirclement from the International Community, and to the regime's control over media, which makes it easy for Russian leadership to ascribe the deterioration of the economy to the West. Regardless of the cause, Russia's political stability does not seem to be an issue, and probably will not be until Vladimir Putin is in power. For all these reasons, we consider political stability as a prospective risk, likely to materialize in the long-term, when the political vacuum around Putin's personality will come out.

CHAPTER II. IMPLEMENTING THE VALUE-BASED ERM FOR COUNTRY RISK EVALUATION: PRE-MITIGATION FRAMEWORK

The second chapter corresponds to Risk quantification process, which attempts to quantify key risks in terms of their value impact on the relevant metrics. To do so, it has been developed a financial model in the form of a spreadsheet-based tool that quantifies multiple deterministic risk scenarios for each key risk in terms of its potential impact on GDP. The result is the realization of a dynamic model that properly represents the relation and the impact of the risk concerned on the driver components and hence on the final

metrics- that is GDP over time, from which it is possible to extrapolate the compound annual growth rate.

The starting point of this process is the baseline calculation, defined as the evaluation of the country long-term growth based on current expectations. It is performed through the definition of the GDP components- consumption, investment, government expenditures and net exports- and of their subcomponents. This process allows to better understand the real transmission channels from the risk-event to GDP and gives a measure of GDP sensitivity to the analyzed risk. Indeed, one risk will affect certain sub-components more than others, and with different intensities than another risk. Quantifying these impacts gives a clear picture of the intrinsic severity of each risk.

The next process-step involves the quantification of multiple deterministic risk scenarios for each key risk, in terms of its potential impact on the baseline scenario and hence, on GDP long-term growth. It shall be noticed that the definition of risk is any deviation from expectations and that expectations are represented by the baseline value. As a consequence, the individual risk exposure involves the quantification of the shocks that impact any element of the model and eventually the baseline scenario. The results arising from the development of the model show that long-term GDP growth is affected by the two analyzed risks in different terms: the downside and upside volatility of Russian GDP along the baseline value is far higher for commodity risk than for sanctions. The higher impact of commodity risk is due to the peculiar economic structure of the country, which is energy resource-based. Any collapse in the oil and gas prices determines a significant variation in the GDP value. The lower impact of sanctions, however, can be explained by the fact that the most affected element –net exports- actually represents a small share of Russian GDP, which suffers more from the generally high uncertainty of financial markets than from the real risk impact. Moreover, sanctions are having controversial effects on Russian economy, as they are effective because of Russian openness to global markets, but they are also undermining it, thus inadvertently pushing the country towards a higher degree of economic independence. Therefore, not only does the severity of their impact turns out to be much lower than expected, but they could also push the country to

diversify their commercial and diplomatic partnerships or to start producing the sanctioned goods on their own.

The second step consists in the definition of the country risk exposure, which shows the long-term impact that the combination of deterministic risk scenarios can have on Russian GDP growth. Running risk scenario simulations allows for a better understating of risk interactivity, as they also take into account the action of exacerbating effects. These effects arise from the fact that the two risks exercise the same action on a certain number of value drivers, thus reciprocally exacerbating each other and increasing the volatility of GDP along the baseline value. As a result, the two key risks determine a higher overall risk exposure than the sum of the two individual impacts together, mainly due to the joint impact that the two risks have on net exports, government budget and unemployment.

This chapter concludes by assessing the need of mitigation policies able to reduce the GDP sensitivity to commodity prices and international sanctions.

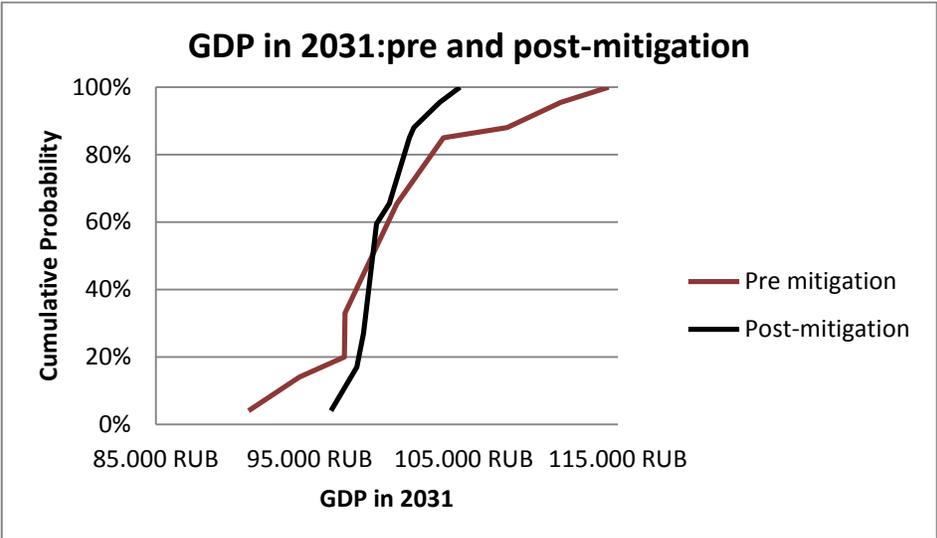
CHAPTER III. SUPPORTING POLICY DECISION-MAKING: HOW TO MITIGATE THE IMPACT OF KEY-RISKS

An important feature of the value-based Enterprise Risk Management consists in supporting decision-making by measuring the potential impact of key risks on both a pre-mitigation and post-mitigation basis. This process-step offers a clear “before and after” picture of the impact on value and on value volatility of the risk mitigation in question. In the third chapter is provided a policy advice to Russian government on how to reduce the country risk exposure and to mitigate the effects of international sanctions and commodity risks. Indeed, risk mitigation involves the reduction of both down-side and up-side risk, thus decreasing the volatility to the baseline value. By adopting the same approach of the second chapter, it is quantified individual risk exposure for both risks and then the combined effect post-mitigation.

The policies that should be adopted to reduce the risk exposure involve the re-orientation of industrial and commercial policies, which aim at reducing the share of hydrocarbons in Russian economy and at strengthening economic and diplomatic ties with alternative partners of Europe, such as China, India or the Eurasian Economic Union States. Mitigation seeks to diversify Russian economic structure, both domestically and internationally. Its main purpose should be to develop alternative sectors that, although not as competitive as oil, gas and mining and defense, still represent highly potential industries that are worth developing, such as the automotive industry, transport, road and agriculture machinery production, light and foodstuffs industries. Alternatively, mitigation should also explore new commercial and diplomatic routes in order to diversify the risk and reduce the buyer power that European countries currently exert on Russia. Opening to new international investors could also contribute to finance key-projects, such as the Siberia pipeline or other infrastructure projects which are crucial to Russian future development.

When implementing the value-based ERM model to take into account the relevant mitigation policies, the results show a lower mean value of GDP at the end of the analyzed period but also a significantly lower volatility than in the pre-mitigation framework. In other words, mitigation has a cost: not only does it decrease both upside and downside risk, but it also directly translates into a slightly lower growth over time. The graph below shows the Cumulative Distribution Function, which is the probability that GDP at the end of the analyzed period will take a value less than or equal to the one displayed on the x-axis. Since the vertical axis represents probability, it must fall between zero and one. It increases from zero to one as we go from left to right on the horizontal axis. This figure clearly shows that in the post-mitigation framework the range of values GDP can take over time is lower, but also that these values are slightly lower than their pre-mitigation counterparts.

Figure 32- Cumulative Distribution Function



Lower mean values (be them the baseline or the expected value) are the consequences of a higher instability due to the shift in Russian economic structure: apart from unprecedentedly low oil prices of the last years, hydrocarbons industry remains one of the most profitable ones, and a resource-based economy going through structural reforms to change this aspect raises doubts as to whether the country can effectively manage a swing from a well-established and consolidated path to a difficult, uncertain in terms of result and long-term oriented approach. In the long term, however, effective risk mitigation policies would stabilize Russian economy and strengthen its structure, thus reducing its sensitivity to external shocks. The chapter closes with a comparative analysis that weighs the consequences of the mitigation strategy and the *status quo*.

CONCLUSION

This paper turns out to be an interesting example of how the best practices of the private sector can be generalized also to those entities that do not operate for profit. It suggests an implementation of the widely known value-based Enterprise Risk Management that

makes it able to identify, monitor and quantify the impact that key-risks can have on the distributable cash flow of a company as well as on the economic performance of a country. Through this tool, this research assesses the severity of the impact that commodity prices and the sanctions regime are having on Russian long-term growth. However, the model developed in this paper should not be thought of as a mere forecasting tool; rather it highlights the major trends of Russian economy and the relative impact of key-risks. It shows the primary role that commodities and international relations play in Russian economy, and which of these can have a greater impact on it. Long-term growth of Russian economy will probably not perfectly correspond to what predicted in this paper, still the model provides with possible ranges showing the value that Russian GDP can take over time. These ranges can be considered as a measure of sensitivity to certain parameters, and always reveal useful information.

It shall be noticed that the major threat of sanctions comes from the restriction for European partners to sell dual-use technology, which is widely used for oil extraction and drilling. However, the ban will produce its effects in the long-term, when the current technology will become obsolete. Were sanctions to remain in place in the long-term, Russia should start producing its own technology or find alternative partners with a high level of technological advancement. This search could turn out to be not as easy as it seems to be, if one thinks that almost all developed countries, the only ones that today could provide Russia with dual use technology, have unilaterally adopted sanctions and embraced the ban.

This paper confined itself to the analysis of two key risks, however the value-based ERM model can support complex risk simulations with a significantly higher number of risks and risk scenarios. For instance, one could extend this analysis to the additional three risks identified in the qualitative risk assessment- currency, corruption and capital flight- and run additional risk-scenario simulations for the definition of the country risk exposure. Considering a higher number of variables means identifying more precisely the possible range of values that Russian GDP could have in the long-term. It could be argued that the value-based ERM is a mere forecasting tool, unable to predict future trends when

base assumptions change over time. Nevertheless, the fact that the model succeeds in identifying a possible range of values for the chosen metrics, always reveals useful information regarding its sensitivity to the analyzed risk. The interest of the value-based ERM also lies in the identification of the transmission channels, which represent the mechanism through which risks interact with the relevant metrics, thus helping authorities to address any potential threats more effectively. Therefore, although potentially inaccurate because of the very nature of forecasting- not because of the inappropriateness of the tool itself- the value-based ERM provides with a robust and yet practical approach to determine the exposure to key risks of any entity, adapting itself to different kinds of metrics. The access to reserved data and the use of a more sophisticated software can extend the value-based ERM's potential applications even further and make it a real instrument of political economy.