Modernization of the Russian Economy : Fossil Fuels, Diversification, and the Shackles of International Political Economy

Aalto, Pami; Lowry, Anna

Kivinen, Markku; Humpreys, Brendan

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2. MODERNIZATION OF THE RUSSIAN ECONOMY: FOSSIL FUELS, DIVERSIFICATION AND THE SHACKLES OF INTERNATIONAL POLITICAL ECONOMY

Pami Aalto & Anna Lowry

Abstract

This chapter elaborates on the choices made for modernizing the Russian economy under Vladimir Putin's reign, from his inauguration in 2000. We propose that from the start, modernizing the economy was a major goal for his government. The initial choice was to pursue wide-ranging interests of the state and society by means of developing the fossil fuel sector. However, The government has simultaneously sought to diversify the economy by supporting the non-fossil fuel sectors. Diverting from the existing resource curse discussion, we show how energy resources are both the blessing and the curse of Russian development. They have been the main source of Russian economic growth, but at the same time key branch for rent-seeking. In existing literature, Russian economic policy is seen as either neoliberal or state-run. Our empirical analysis shows that it is both. Currently Russian think tanks are hankering for a mixed economy and developmental state, whereas the actual economic policy still has strong elements of neo-liberalism. The Russian elements of the mixed economy are driven by East Asian examples, and Russia's commodity-based economic structure is generally compatible with developmental industrial policies. However, bureaucratic power in Russia is not centralized in the developmental state fashion.

2.1 Introduction

This chapter elaborates on the choices made for modernizing the Russian economy under Vladimir Putin's reign, from his inauguration in 2000, until the advent of his fourth term as the President of Russia (2018—). We propose that modernizing the economy was from the start a major goal for his government. A modernized economy would serve several interests. It would generate the financial resources necessary for modernizing the state and society, including key infrastructure, and state institutions responsible for the welfare and education systems, while it would also bolster Russian foreign policy influence, security services, military capability, as well as identity and culture. The initial choice of Putin's government was to pursue these wide-ranging interests of the state and society by means of developing the fossil fuels sector (Sutela 2012, 36-7; Tkachenko 2008, 171). Thereafter, fossil fuels have been central to many visions for Russia's development (Bouzarovski and Bassin 2011).

The government has simultaneously sought to diversify the economy by supporting the non-fossil fuel sectors. Many observers associate the diversification aim with the presidency of Dmitry Medvedev (2008-12). However, diversification was already part of Soviet economic planning since the 1960s (Gill et al. 2014, 43). Medvedev's initiatives more specifically built on the policy planning conducted since the early 2000s (Crane and Usanov 2010, 118; Lowry 2016). Putin himself referred to diversification in 2005 and 2006 (Sim 2017, 176; Sutela 2012, 40-41). Although the fossil fuels-

based choice and the income it generated enabled the diversification policies in the first place, a question persists as to what extent these two options can co-exist (Sutela 2012, 116). Here, the Russian case is part of a wider debate on whether natural resources are a blessing or a curse (van der Ploeg 2011).

On the one hand, the export of oil was the primary generator of wealth in the 2000s in Russia (Gaddy and Ickes 2013, 24). On the other, overreliance on natural resources in middle-income economies of Russia's type is often associated with weak long-term growth. In the debate on the 'resource curse', several risks are identified for resource-rich states. They become highly dependent on commodity prices on world markets, and may suffer from volatility in the production of natural resources, and from currency appreciation, all of which may endanger their competitiveness. In the related debate on the 'voracity effect', resource-rich states are also associated with unequal distribution of income and wealth, and weak institutions (Gill et al. 2014). Diversification, in turn, usually represents a means to widen the range of industrial capacities and hence, create new areas of specialization and competitive advantage enabling future growth (EBRD 2016; Sim 2017). This debate on the impact of natural resources on Russia's economy is indeed one of the fundamental antinomies of Russian modernization processes in the 2000s, confusing not only the actors when they seek to make sense of their own choices, but also analysts of Russian conduct.

Another antinomy we will discuss pertains to two mutually-contradictory growth models. The *neoliberal state model* is exchange-focused, based on liberalization of markets, and it prioritizes opening up to the international economy. The *developmental state model* for its part is production-focused, based on managed trade policy, and prioritizes high and sustained economic growth in order to rapidly catch up with developed countries. The two antinomies are analytically separable but practically related. For example, a natural resources-based economy can be developed by both neoliberal and developmentalist means, or by combining the two. At the same time, many observers either implicitly or explicitly assume that the diversification of Russia's economy supposes developmentalism of some sort, like once witnessed in the rise of East Asian economies.

These antinomies regarding the role of natural resources in Russia's economic modernization and the related growth models frequently hamper (even well-informed) debate on Russia's political economy. Therefore we propose several conceptualizations and analytical classifications to form firmer ground to further debate and to help us understand better where its different lines emanate. We seek to make three main contributions.

Firstly, we apply the structuration approach to the debate on Russia's economic modernization. In the wide domain of political economy, this approach has previously been applied to study Russian fossil fuel policies (Aalto et al. 2012, 2014; Aalto 2016a; Sharples 2016), renewable energy policies (Smeets 2017), nuclear energy policies (Aalto et al. 2018), as well as infrastructure development (Gritsenko and Efimova 2017) and ecological modernization (Tynkkynen 2014). With this approach, we point at the interplay of a multitude of competing actors and interests within Russia, and the complex structures they need to 'master' or 'negotiate' in order to pursue those interests (Aalto et al. 2012; Aalto 2016a; Kivinen and Cox 2016). This means that fossil fuel-based and diversification choices can co-exist when Russian actors attempt to serve several interest groups simultaneously and thus keep the vast country together. On some occasions, the interests are compatible and can be pursued simultaneously, given the assets Russian actors possess and their ability to remove the structural constraints that they encounter. In these cases we witness successful policies with tangible results such as new fossil fuels infrastructure supporting production, transport and export of commodities and products, or existing economic sectors reinventing themselves, or entirely new sectors emerging. On other occasions conflicting interests within the society hamper the ability of the

government to expedite collective action to develop the economy (Aalto et al. 2014). Structural constraints on the domestic or international levels may also be insufficiently taken into consideration, or be stronger than foreseen, resulting in delays, policy failures, and unsuccessful business operations. In other words, our approach privileges neither actors or structures, instead probing their interaction. The open-ended nature of the approach enables us to find instances where resources function as a blessing and those where they are more like a curse, depending on the examined time period and sector of the economy. At the same time, we seek to shed light on some of the major *turning points, or critical junctures* structuring Russia's modernization choices and development models.

Secondly, our use of the structuration approach allows us to discern several different policy options oscillating between the fossil fuels-based choice and diversification. For example, we will refer to *narrow diversification* within the Russian fossil fuels sector, whereby actors switch to higher value added products designed for new markets in place of 'mere' crude oil or natural gas production, transport, and sales. Refined oil products such as fuels, petrochemical products and liquefied natural gas (LNG) exemplify this option. Moreover, by means of *geographical diversification*, Russian actors can seek new markets for commodities and higher value added products alike, by diversifying the customer base beyond the traditionally pivotal European markets. *Resource intensive diversification* for its part refers to actors utilizing Russian non-fossil fuel resources such as uranium and metals, to develop manufacturing and the heavy industry; or developing Russia's considerable agricultural land and forestry resources. This nevertheless often means heavy reliance on fossil fuels in the production processes and market delivery. With *broad diversification*, we finally denote efforts to develop, for example, the high-tech and consumer goods sectors where natural resources play less of a role and the ecological repercussions are likely to be smaller, although the actual environmental impact of these high-tech sectors is debatable (see Madsen 2018).

Thirdly, our structuration approach scrutinizes not only Russia's asset base and the constraints of its domestic economy, society, and politics, but also extends to the changing institutional structure of international political economy. In particular, for several years since 2014, Russian actors faced not only lower oil prices, and hence lower export income and unbalanced state budget, but also several (mostly Western) states setting economic, financial, and political sanctions on Russia after its annexation of the Crimea, and the subsequent war in eastern Ukraine, featuring Russian involvement. At that time, the Russian economy had just recovered from the effects of the global financial crisis of 2008-9 (Malle 2013, 78) (Table 1). The fossil fuels sectors were instrumental for that recovery, and were supported by the metal and chemical industries, as well as the forestry and agricultural sectors. A broadly similar export portfolio helped to overcome a threatening state collapse in 1999 (Grigoriev 2013, 20).

Macroeconomic indicators	**2000**	**2010**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
GDP, %-change	10	4.5	3.7	1.8	0.7	-2.5	-0.2	1.5
GDP, USD billion	259.7	1524.5	2193.6	2292.1	2051.7	1359.9	1289	1578.7
Industrial production, %-change y-o-y	8.7	7.3	3.4	0.4	1.7	-0.8	1.3	1
Fixed investments, %-change y-o-y	17.4	6.3	6.8	0.8	-1.5	-10.1	-0.2	4.4
Retail sales, %-change y-o-y	9	6.5	6.3	3.9	2.7	-10	-4.6	1.3

Exports, USD billion	99.2	392.7	527.4	521.8	496.8	341.4	281.9	353
Imports, USD billion	42.1	245.7	335.8	341.3	307.9	193	191.6	238
Current account, USD billion	45.4	67.5	71.3	33.4	57.5	67.7	24.4	35.2
Unemployment, %	10.6	7.3	5.5	5.5	5.2	5.6	5.5	5.2
Population, million pers.	146.3	142.9	143.3	143.7	146.3	146.5	146.8	146.9
Fiscal indicators for federal government								
Revenues, % of GDP	15.5	17.9	18.9	17.8	18.3	16.4	15.6	16.4
Expenditures, % of GDP	14.1	21.8	18.9	18.2	18.7	18.7	19.1	17.8
Balance, % of GDP	2.4	-3.9	-0.1	-0.4	-0.4	-2.3	-3.4	-1.4
Central government debt, % of GDP	52.1	8.5	9.7	10.5	11.1	11	12.3	13
External debt, % of GDP	44.5	2.1	2.4	2.7	2	2.2	3	3.5
External debt, USD billion	115.5	32.2	53.5	61	41	30	38.9	55.6
Oil funds, USD billion		113.9	150.7	176	165.9	121.7	87.9	65.2
Monetary indicators								
Inflation, %, y-o-y	20.8	6.8	5.1	6.8	7.8	15.5	7.1	3.7
M2, %, y-o-y	58.8	33.8	16.8	15.3	7.3	6.5	11.3	10.3
Average wage, USD	80.1	698.5	863.3	946.7	850.2	558.1	547.9	671
Deposit rate, %	4.2	4.9	6.1	5.1	12.3	8.4	6.5	5.3
Lending rate, %	18.2	9.1	9.4	9.4	18.3	13.8	11.8	9.4
Forex reserves incl. gold, USD billion	28	479.4	537.6	509.6	385.5	368.4	377.7	432.7
Crude oil, Urals, USD/barrel		78.2	110.4	107.9	97.7	51.3	41.9	53.1
RUB/USD exchange rate	28.1	30.4	31.1	31.9	38.6	61.3	66.8	58.3

TABLE 2.1 RUSSIA'S ECONOMY: MACROECONOMIC, FISCAL AND MONETARY INDICATORS

Source: BOFIT. The year 2011 is omitted owing to a lack of space; however, that omission does not change the trend from 2010.

Although fossil fuel exports yielded large profits for a decade and a half, and are still crucial for Russia, the following low prices and sanctions realized the risks inherent in this volatile sector (cf. Sim 2017). The resulting budget deficits and cuts, plus heavy use of the Reserve Fund and National Wealth Fund to finance investments underlined how dependent Russia – a natural resources-exporting great power – was on the developments in international political economy, whether in good and bad times (Table 1; also Aalto and Forsberg 2016). Hence, during Putin's third presidential term (2012-18), the government decided to regain control over the markets. This included a firmer grip over the

fossil fuels sector where the state had already consolidated its positions during the 2000s (Baev 2008; Tkachenko 2008). Diversification would be pursued over a longer time span (Malle 2013, 79).

Here we will firstly discuss the well-known fossil fuels-based choice in light of the structuration approach. This also covers the narrow or 'within-sector' diversification efforts, as well as geographical diversification efforts, pointing at both policy and business successes and unintended consequences. Then we use the same approach to shed light on Russia's diversification choices as an alternative vehicle of economic modernization, referring to both resource-intensive and broad diversification policies. However, most of the examples we can cover in this chapter are limited to the manufacturing sectors. Moreover, since we seek to synthesize existing knowledgle, pulling wide and complex debates together, our brush is inevitably broad. Most of our material consists of previous research, while we also draw upon our own previous findings and refer to some statistics. With these reservations, in the concluding section, we discuss Russia's choices in light of developmental state models and some key structures of international political economy.

2.2 The structuration approach: choice for fossil fuels

We postulate that any choices to modernize the Russian economy must take account of the multiple interests within the state and society. To serve those interests, the government must make well-informed choices on the use of the country's assets. This all takes place within the confines of complex structures that both enable and constrain the options. Such structures are both historically-formed and of more recent origin, and extend from the domestic level onto wider international relations and political economy (Aalto et al. 2014).

Several structures dating back to the Soviet era pushed Russian choices towards fossil fuels. Domestically, Russia's high price of investment meant that diversification would produce less growth because of low productivity, state ownership in the manufacturing sector, and the location of factories in regions with high development costs (Gaddy and Ickes 2013).

Russia's choices concomitantly depend on the structures of international political economy. In the late 1990s, exports of fossil fuels provided the most obvious means of generating the cash to pay back the originally $60bln Soviet-era sovereign debt to the Paris Club countries, including Germany and the US, and the additional loans to the International Monetary Fund (IMF). From 1999 until 2014, the prices of oil were on an upward trend, excepting the steep drop experienced during autumn 2008 with the global financial crisis. Expectations of supply problems due to transit risks, production gaps, and future scarcity also supported the generally high price levels (Aalto 2008). The Russian natural gas exports benefited from their linkage to the rising oil prices in supply contracts.

We treat the thus understood domestic and international structures as a *policy environment* wherein the Russian government and other actors operate. The policy environment includes both material and social features (Aalto et al. 2014). For analytical purposes, we divide the policy environment into four dimensions: 1) *resources, infrastructure, and technology*; 2) *finance, markets, and business models*; 3) *institutions*; and 4) the *ecological dimension*. The actors seeking to master the multiple enabling and constraining features of these dimensions of structure are many, ranging from governmental to business and financial actors in Russia and beyond. Moreover, they have different cognitive frames and pursue several interests, not all of which are easy to accommodate with each other (Figure 1).

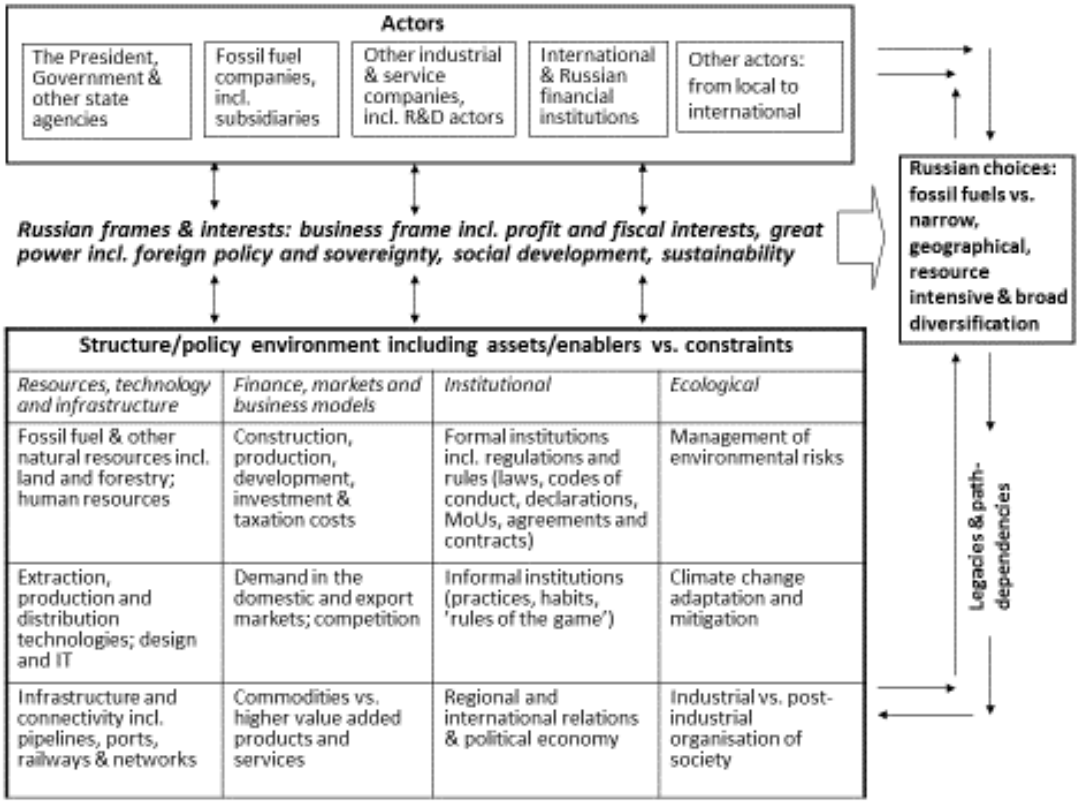

FIGURE 2.1 THE STRUCTURATION OF RUSSIAN MODERNIZATION CHOICES

Source: CREATED BY PAMI AALTO ET AL.

Firstly, the choice for modernizing the economy through developing fossil fuels naturally privileges fossil fuel companies as actors. After all, energy companies are the ones who extract, produce, distribute, and sell fossil fuels. Russian and international financial institutions (IFIs) provided the necessary credit for this capital-intensive business – until the sanctions of 2014 hampered the participation of many non-Russian IFIs and prompted a turn towards domestic and, for example, Chinese funding (Aalto and Forsberg 2016).

To grasp how the *interests* of energy companies relate to those of many other actors, we can speak of a *business frame*. For the Russian fossil fuel companies, the foremost interest is *profits* from exports. This is because Russian oil companies export over two thirds of the country's production, and a third of the natural gas production (BP 2017), while the domestic prices of natural gas and electricity remain subsidized despite a decade of efforts at pricing reforms.[i] The subsidies represent a powerful Soviet legacy shaping the whole economy; on the one hand, some actors benefit and even depend on low fuel costs, ranging from home-owners with low incomes to small businesses; there is a risk of popular discontent if prices are increased. On the other hand, low fuel prices may incentivize inefficient energy consumtion and disincentivize energy efficiency measures. Overall, the two tendencies lead to inefficient use of resources. With these domestic constraints, export markets are the chief sources of profits for the companies (Bradshaw and Connolly 2016, 18-19). Under the business frame, the state for its part has a *fiscal interest* to benefit from the profits of companies by means of taxes set for the extraction and export of minerals, as well as taxes on corporate profits and personal income for their employees. The state can also generate revenue from dividends or sales of

shares if it has ownership in these companies (Aalto 2016a). The resulting budget revenues serve the wider interests of the state and society. Russia's 'rent management' system helps to maintain social order by redistributing the profits through the central administration back to the numerous regional actors and interest groups (Gaddy and Ickes 2015).

Secondly, the Russian state has a *great power frame* (see also Baev 2008; Mäkinen 2011; Smith 2014), including two types of political interests. Exports of fossil fuels can support *foreign policy influence*. However, efforts to exert influence can also have unintended consequences since Russian actors can only to a limited extent control the international structures through which Russia conducts its energy diplomacy, or the domestic structures in target countries (Aalto and Forsberg 2016; Aalto et al. 2017). We propose that the Russian capacity to exert foreign policy influence through the trade of fossil fuels varies from case to case and between markets, target countries, and product segment – oil, oil products, natural gas, and LNG (Aalto 2016b; Stulberg 2007). Moreover, issue-, project-, and policy-specific differences exist in Russian conduct (Hadfield 2016; Romanova 2016). The other interest under the great power frame is *sovereignty* whereby Russia seeks to secure its freedom of manoeuvre in international relations and political economy, and a greater degree of autonomy and self-determination domestically than before Putin's reign. This includes state control of the economy in general, including the fossil fuels sector and energy provinces (see Averre 2013; Baev 2008; Gaddy and Ickes 2015: 26; Oxenstierna 2015a, 1; Sakwa 2014, 27; Silvius 2017).

Thirdly, the fossil fuel producing regions have a *social development interest* as they expect the oil and natural gas companies to invest in the physical and social infrastructure of the production, transit, and servicing areas, while the companies have an obligation to pay land and property taxes. Support for educational establishments, kindergartens, and sports facilities may also come into the equation (Aalto 2016a). Nevertheless, inequalities in income are great in these regions (Zubarevich 2015, 184). Russia's Northern and Siberian regions, which host the bulk of emerging fossil fuel production, have decreasing population trends, except for the Yamalo-Nenets and Nenets regions.

Fourthly, the *sustainability frame* of the state and society includes interest in social responsibility, ecological security, and innovative development, as well as energy efficiency throughout the industry (Shadrina 2014, 60). This frame receives most consistent support from the regional and local level actors who are most affected by the environmental consequences of oil and natural gas extraction. The support for the energy efficiency and innovation issues remains limited as long as the domestic energy prices are subsidized. On the state level, this frame is secondary to the business and great power frames (Orttung 2015, 215-16).

How did the Russian actors combine the pursuit of these different interests via the choice for fossil fuels? How did the consequent outcomes shape the policy environment regarding the diversification options? To assess this, we must return to the enabling and constraining features of the policy environment. Here we can only offer a schematic summary, without making a sharp distinction between the oil, natural gas, and other segments.

2.2.1 The dimension of resources, technology, and infrastructure

This dimension is fundamental to an economy dependent on income from exports of fossil fuel resources (Gaddy and Ickes 2015, 11-13), and to a state prioritizing technological modernization (Autio-Sarasmo 2016), while the pursuit of infrastructural modernization remains a powerful Soviet legacy (Kivinen and Cox 2016).

Natural resources were central to the Soviet Union. However, exports never constituted a large part of the mostly domestically-oriented Soviet economy, although their share gradually increased

towards the end of the Soviet era. Fossil fuels eventually made up some 80% of the hard currency earnings (Bradshaw and Connolly 2016, 11-12). In the 1990s, privatization of parts of the centrally-planned fossil fuels industry resulted in a few large companies combining their Russian resource base with acquisitions of assets from abroad (Poussenkova 2012), and some companies with a clearer regional profile in Russia. In several hastily conducted and often none-too-transparent operations, enormous resources ended up as the possessions of very few individuals who then exported the profits outside of Russia (Adachi 2010).

With Putin's government inheriting a fossil fuel-dominated economy not serving the state's fiscal interests too well, it sought to increase the role of the state in the sector and its share of export proceeds. To this end, the government completed taxation reforms, partially re-nationalized Gazprom, and made Rosneft a mostly government-owned oil major with the assets obtained from the forced bankruptcy of the privately-owned Yukos (Tkachenko 2008). The government furthermore significantly expanded the resource base of Gazprom and Rosneft through auctioning a series of licenses for them to develop new oil and natural gas fields in Russia's Arctic and eastern Siberia (Moe and Kryukov 2010). Moreover, Gazprom bought part of the business of Royal Dutch Shell in 2007 in Sakhalin, and in 2011, the Kovytka fields of TNK-BP, then half-owned by the British Petroleum (Dusseault 2012). The overall result was more state control over Russia's resources although the Russian actors continued developing the resources in cooperation with foreign companies.

Gaddy and Ickes (2010) go as far as to argue that Russia *must* realize its competitive advantage and draw benefits from its fossil fuel wealth. Depending on the estimate, this includes some 5-10% of global oil reserves, and roughly a quarter of natural gas reserves (excluding unconventional reserves such as shale oil and shale gas resources), plus significant coal reserves (Aalto 2012, 7-9). Gaddy and Ickes (2015, 17) furthermore calculate the fossil fuels sector to offer the most potent source of growth over the next few decades, amounting to some 0.7-1.4% if the resources are managed well. Nevertheless, they note the associated constraints or 'bear traps' on the fossil fuels choice that are traceable to the Soviet, and even imperial eras. These include how Russian fossil fuel reserves straddle a vast territory, of which large parts are remote and very cold. This geography sets extreme requirements for the industry. The simultaneous abundance of the resources yields high rents that for their part enable the country to develop a 'resource addiction' throughout both state and society (Gaddy and Ickes 2013, 2-3). It *is* an addiction, since the legitimacy of the government depends on its ability to redistribute the rents from this sector to the multiple groups within society. In this way, the survival of many sectors of the economy also depends on fossil fuel.

Although the production, distribution, and refining of fossil fuels only employs some 1.5% of Russians (Simola and Solanko 2017, 4), the jobs it offers are capital-intensive, and as a rule, well paid (Zubarevich 2015, 185). Consequently, the sector attracts some of the most able human resources from other sectors. Fossil fuel companies have also supported the establishment of new faculties and teaching programmes in Russian universities to produce a workforce for themselves. For example Gazprom, the monopoly company for pipeline-based natural gas export, the oil pipeline monopoly company Transneft, and Rosneft are all official partners to major universities in Moscow and St. Petersburg. In the oil and gas producing regions, the social development interests of local governments routinely lead them to oblige the companies operating in their regions, whether Russian or foreign, to support local educational establishments and other social needs.

In terms of technologies, the fossil fuels industry of the 1990s inherited Soviet knowhow. This did include 'vertical fracking' technologies that the shale oil and gas industry in the US very successfully combined with horizontal drilling in the late 2000s. Yet, most Soviet technologies were best suited for exploiting the 'easily' recoverable oil and gas in large-scale onshore fields. Hence in combination

with the low prices of the 1990s, Russian companies were unable to redress the decline in production, which in the oil segment amounted to a 50% drop in 1995 from the level of 1989 (Rutland 2015: 73). After the financial crisis, the private companies Yukos and Sibneft successfully utilized modern Western technologies, and recruited and trained staff to boost production in declining fields. Yukos successfully globalized its operations, benefiting from the lessons learned through its global partnerships (Poussenkova 2012, 191-194). With new energy resources being taken into use in the demanding conditions of the Arctic and Far Eastern regions, including offshore fields, Russian actors became more heavily dependent on Western technology, equipment, and expertise. This meant an increase from roughly 30-50% technology dependence in the whole industry to 80-90% in the new energy provinces (Aalto 2016a). As the sanctions of 2014 targeted such frontier oil exploration technologies, Rosneft and Gazprom's oil arm, Gazprom Neft had to continue developing this expertise on their own, after having started the work with Western service companies before the onset of sanctions. They also sought to acquire the needed equipment from Asia (Harrington 2016).

In terms of infrastructure, the fossil fuels industry inherited many Soviet era assets and constraints. For example, the Soviet-built oil and natural gas pipeline system was oriented towards the major European markets, to where some 70% of the oil exports went until the late 2000s. Another 15% went to the former Soviet area using largely the same infrastructure; likewise, all gas exports went to these areas until the Gazprom-led consortium shipped its first LNG from Sakhalin-2 in 2009 (Tabata and Liu 2012, 159-65). That Russia's 2009 energy strategy targeted re-orienting 22-25% of oil and 19-20% of natural gas exports to Asia by 2030, will still mean long-term dependence on central and eastern European transit countries (Shadrina 2014, 59). Disagreements over transit prices, contracts, and ownership of the pipelines, and other assets in the transit countries resulted in several transit conflicts with Belarus and Ukraine between 2004 and 2011 (Balmaceda 2012; 2013; Tkachenko 2008). Looking through the great power frame, these infrastructural constraints were unpalatable, leading to the building of new ports and the overcapacity of gas export pipelines, including the Nord Stream through the Baltic Sea to Germany to secure exports to Europe (Baev 2013).[ii] The entirely new pipeline infrastructure through Siberia to reach the Asian markets includes the completed ESPO-1 and ESPO-2 oil pipelines, and the Power of Siberia natural gas pipeline, which is to be finalized by 2019/20 (Motomura 2014; Tabata and Liu 2012). At the same time, Russia and many other post-Soviet states continue to suffer from the excessive energy infrastructure, which was built for the industrial scale and geographical extent of the Soviet Union (Balmaceda 2013, 55-56; 214-216).

2.2.2 The dimension of finance, markets, and business models

The dimension discussed here features structures that shape how Russian actors can convert their resources into financial assets on the international markets to serve the business frame. At the same time, these structures are indirectly relevant for the other frames and interests of Russian actors.

The cost structure of fossil fuel companies features an area riddled with confusion. Costs differ between mature and new fields, onshore and offshore fields, southern and northern production regions, and depend furthermore on what is included into the calculation – investment, operating and taxation costs, etc. As a rule, Russia's competitors in the Persian Gulf have lower operating costs than Russian producers. The lowest costs in Russia prevail in conventional onshore fields in the established, major western Siberian production areas which have lower costs than many African, American, and Asian producers. However, the return of capital is lower than often assumed in Russia's cold, remote areas where a large and increasing part of the fossil fuel production is located. This is so because of the need for insulation, the requirements placed on the materials used, the decrease in performance of both materials and humans in cold temperatures, and finally overcoming the transport costs that ensue from distance and an insufficient infrastructure. Two factors exacerbate these constraints: human resources – whole cities and families – as well as non-oil and gas economic

activities are situated in the fossil fuel producing regions. At the same time, Putin's administration seeks to reverse the depopulation of Siberia and the Far East. This policy maintains the costs for the oil and gas companies – as well as the state – that ensue from keeping these remote areas populated, when economically the most rational policy would be merely keep those economic functions running that are necessary for oil and gas production. This policy means investments into these regions, but such investemnt often performs poorly (Gaddy and Ickes 2013, 24-57; 2015, 21).

The state has sought to limit the taxation costs of emerging production in eastern Siberia and the Arctic by means of tax exemptions (see e.g., Aalto 2016a; Tabata and Liu 2012). With the dwindling of export proceeds owing to low oil prices since 2014, and a one-fifth drop in natural gas demand in the European market during the years 2008-2015, the onset of sanctions increased the domestic investment costs. While investments for many new projects consequently stalled, the required new investment came mostly from publicly-owned financial institutions, to replace foreign investment that previously accounted for some 70%. However, the simultaneous depreciation of the Russian rouble decreased the domestic costs of producers while export income remained in dollars. Nevertheless, the state increased the risks to its fiscal interests as it sought to secure the profit interests of companies (Aalto and Forsberg 2016). Coupled with a capital flight from Russia and heightened uncertainty regarding the willingness of the state to respect its commitments after the conflict with Ukraine (Oxenstierna 2015b, 109), these developments can have unintended consequences for the long-term viability of the business frame and social development frames in Russia.

Regarding markets, towards Putin's third term expectations of stagnating demand for Russian oil and natural gas in the main European markets emerged, owing to the plans of EU area customers to diversify their supplies away from Russia over the long term, and to replace fossil fuels with domestic renewables by around 2050 (Romanova 2016; Shadrina 2014). The gradual re-orientation of Russian production to the Arctic, eastern Siberia, and Sakhalin, and the geographical diversification of exports towards Asia that this enables, will not dissolve the problem of tightening competition. LNG from the US and Australia, as well as piped natural gas from Myanmar are now entering the Asian markets. Additionally, unconventional oil and gas production may also commence in Asia. Nevertheless, from 2007-8 to 2013-14, Russian oil and gas exports to China and the rest of Asia more than doubled (World Bank 2016, 59). Overall, the Russian cognitive frames may be insufficient and too short-term to deal with the ongoing market changes. For example, increased unconventional oil and natural gas production since the late 2000s in the US re-oriented Qatari LNG to the European markets, drove down prices, and lessened the demand for oil imports in the US. The resulting weaker market was not what Russian exporters expected, and eroded the capability of energy trade to support Russia's great power frame and foreign policy influence (Kropatcheva 2014, 8).

The business models of Russian fossil fuel companies have significant legacies from the past. The oil industry's transition from the production of crude oil towards higher value added products has been slow. Taxation policies since the early 2000s successfully supported exports of refined oil products in place of crude oil, although the refined products were often of very low added value, sometimes yielding lower prices than crude oil. The share of refined oil in Russia's oil production climbed slowly from 42.5% to 53.1% between 2004 and 2013, but the depth of oil refining remained at only 71.4% (Bobylev 2014, 20). Since 2014, taxation policies have unsuccessfully supported exports of higher value added products. This failure of the narrow diversification policy was evinced in the rising share of crude oil exports and declining share of refined oil products in the export portfolio (Simola and Solanko 2017, 6-7).

In the natural gas sector, gas transported via pipelines and sold on long-term contracts remains Gazprom's preferred business model. However, it has been forced to switch to more flexible spot

pricing and short-term contracts since the European Commission opened an anti-trust investigation on the grounds of anti-competitive pricing in 2012 (Kropatcheva 2014, 4).[iii] This investigation was part of the Commission's effort to ensure LNG can compete with pipelined natural gas in the European market. With an eye on this globally expanding LNG market, Gazprom's Sakhalin-2 LNG plant is planned to be expanded by 2023/4, while Novatek started LNG exports from Yamal in 2017. Gazprom also plans an LNG plant in Ust-Luga in the Gulf of Finland by 2022/3. These LNG projects will widen the access to the transforming established markets in Europe and open access to entirely new markets that are not at all dependent on pipelines. However, these new paths are partly unintended, representing responses to the market behaviour of the customers of these Russian companies. What once ensured security of demand for Gazprom and protected its investments – the pipeline locked European market – now compromises its options.

2.2.3 The institutional dimension

This dimension features the wide structures of formal and informal rules within which actors must pursue their interests, and relations among the interest groups espousing them, as well as the structures of international order of which fossil fuels trade is part.

The present day structure of formal economic and political institutions in Russia is closely tied to the profit interests and business successes in the fossil fuels sector. Gel'man (2016) portrays this structure in terms of neo-patrimonialism, whereby ruling elites seek to extract rent from the profit-making sectors. Decision-making is largely centralized and hierarchical, and is itself a by-product of the rent extraction system. The autonomy of domestic political and business actors is conditional and depends on the centre, while they are organized into interest groups competing for access to rents (ibid., 458-9). As a result, companies face several risks for their activity: corruption, arbitrary prosecution, lack of sufficient entrepreneurial education, the inability of the civil society to function as a springboard for SMEs and innovations from below, plus limitations of funding in all phases of business (e.g., Aidis 2015; Oxenstierna 2015b). These economy-wide constraints hamper start-up businesses and companies looking to expand, and hence prospects of diversification. This may indirectly protect the fossil fuels industry. In 2011/12, the state adopted several policy measures to improve the formal institutions: the Agency for Strategic Initiatives, an ombudsman for entrepreneurs, and roadmaps to improve business regulations. By 2015, Russia's rating also improved in the 'Ease of doing Business' index of the World Bank, but this is partly explained by the new methodogy of calculating the index where subnational measures weighed more than before (Gel'man 2016, 465). However, in the international oil markets, the record of the Russian state institutions to promote the interests of the oil industry is mixed (Poussenkova 2012). In the natural gas segment, we find numerous cases of the state conflating natural gas trade with foreign policy interests, especially in the former Soviet Union area (Belyi 2015).

The constraints of the formal-regulatory regime are made worse by the coexisting informal regime composed of economic, power political, and other interest groups. The president acts as the arbiter but remains unable to fully control this institutional stalemate. Many observers find powerful private interests or 'crony capitalism' in the natural resources sector, which leads to systemic corruption (Sakwa 2015). The president needs to balance between the competing interest groups. The owners of the fossil fuel industry oversee the production of the rent on which the presidency and social order in the wider sense rely. Although this system does not primarily reduce the wide income differences *within* regions, it reduces them *between* regions. Between 2001 and 2010, the ratio between the richest and poorest regions decreased from 30 to 13 times (per capita gross regional product adjusted for price level differences) (Zubarevich 2015, 185). For their part, the so-called *siloviki* – powerful individuals with a past or present in the security sector – control the army and intelligence services, whose support the government needs in equal terms. This system can manage the economy as it is,

and promote narrow diversification and modernization choices that don't question the overall system, but it is not optimal for wide-ranging attempts of diversification.

Russian foreign policy interests in the Crimea and Ukraine since 2014, and the consequent military operations in these areas affected the regional and international order (see Chapter 3). Crucially, the profit interests of the more export-oriented Russian companies partly depend on this wider international structure. The political and diplomatic sanctions weaken the access of the state to regional and international institutions to ameliorate the thus-formed constraints. Simultaneously Russia's own compensatory project, the Eurasian Economic Union (EAEU), may not support the business frame much, as Russia is in the initial phase its chief funder (Aalto and Forsberg 2016). In this situation, the conclusion of many is that the Russian foreign policy and security interests hamper economic development, hastening a costly and time-consuming reorientation towards China and other Asian powers (Malle 2016).

An alternative interpretation is that the post-2014 problems in Russia's relations with the West have prompted the Russian government to reconsider the neoliberal elements of Russian economic policy. This refers to the criticism of Russian companies pursuing pure profit interests, and their managers pursuing their own personal interests, by relying on foreign loans and investments that create corporate foreign currency debt. This results in foreign ownership of Russian profits. According to the critics, such dependencies maintain the resource orientation of the economy and compromise the state's sovereignty and foreign policy interests in an era of unstable international order since the onset of sanctions. Part of the Russian economic establishment thinks that neoliberal policies make the Russian economy susceptible to destabilization by the US. Some extend the sovereignty interests towards self-sufficiency, to protect the government's leeway and avert any dangers of being subjugated to the interests of its competitors. These observers oppose the neoliberal majority of the Russian economic establishment who believe in 'Western' policies (Roberts and Hudson 2016).

2.2.4 The ecological dimension

The environmental consequences of the production, transport, and use of Russian fossil fuels are enormous. On top of the effects of exported fossil fuels burned abroad, fossil fuels account for almost 90% of Russian domestic consumption of energy (EIA 2016). In addition, the Russian economy remains highly energy-intensive compared to countries with similarities in climate and industrial structure, such as Finland and Norway. Russian authorities are increasingly aware of these environmental risks and of the needs of mitigation, especially insofar as these place constraints on economic development (Tynkkynen and Tynkkynen 2015, 61). The environmental constraints on the profit interests of the fossil fuel industry are greatest in the emerging Arctic production areas, where the new and emerging production competes with more traditional forms of economic activity and socio-cultural structures (Orttung 2015), and where pockets of local renewable production also emerge (Text box 1). Similar risks concern the offshore areas, in particular regarding the use of the Northern Sea Route for the needs of the oil and natural gas industry (Gritsenko and Kiiski 2015).

For its part, the 'Arctic paradox' conveys a constellation of constraints and enablers for the Russian choices regarding fossil fuels. Climate change, induced by the burning of fossil fuels, makes new Arctic fields better amenable for production. This leads to more fossil fuels burnt, which in turn further accelerates climate change (Palosaari 2012). This is coupled by the paradox whereby Russia's economic diversification – which could make it less reliant on fossil fuels – depends on the financial assets of the fossil fuel sector. At the same time, investment decisions favoured the fossil fuel sector during the 2000s when these financial returns were the greatest. Onshore, the potential constraints ensuing from climate change include melting of the permafrost and its implications for transportation and the construction of infrastructure (Bradshaw 2012, 227). That said, the Russian understandings

of the sustainability frame include an element of climate change denialism. Although federal level climate strategies exist, such considerations do not profoundly define energy policies. Moreover, local level authorities in particular lack the sufficient financial resources to implement them (Skryzhevska, Tynkkynen, and Leppänen 2015; Tynkkynen and Tynkkynen 2017).

Text box 1: Renewable energy in Yakutia

Daria Gritsenko

The Republic of Sakha (Yakutia) is the largest and scarcely populated territory of the Russian Federation, with less than one million people residing in 445 municipalities scattered across the territory of 3 mln km^2. Large distances, permafrost and extreme continental climate, with an annual temperature differential around 80°C, make many parts of Yakutia isolated and inaccessible. The automobile road density in Yakutia is 16 times lower than the Russian average – only 3.8 km/1000 km^2 – and the multiple rivers, including the Lena, are only navigable for about 4 months a year. 90% of the territory relies either on summer navigation or on winter roads build on compacted snow or ice cover.

A sparse and patchy settlement pattern, poor transport infrastructure, and extreme cold hamper energy provision. Yakutia consists of three 'centralized energy regions': Southern (around Neryungri, mainly relying on local coal for energy production), Western (around the world-famous diamond mine in Mirny, supplied by Viluy and other hydroelectric stations), and Central (around Yakutsk and its gas-power station from local gas extraction), together supplying electricity to 85% of the population. The rest of Yakutia – the Northern energy district covering 64% of its territory – is off-grid. Each of its 144 settlements is autonomous in terms of electricity production and heating, since construction, maintenance, and exploitation of power lines is not economically viable due to distances, poor accessibility and energy losses.

Sakhaenergo, a unit of RusHydro, Russia's largest hydroelectric power company, is the electricity producer in these off-grid settlements. The standard solution is to use diesel generators, which is costly due to the complicated logistics: one liter of diesel costs six times more than the retail price in central Russia. As a result, every kW/h produced is 20% fuel price and 80% transport and storage cost. Therefore, when solar panels are deployed, less diesel is bought, transported and burnt, saving 270t of fuel in 2016. Hybrid solar-diesel power stations improve local energy security and curb carbon emissions in ecologically-sensitive areas.

The first experiment with renewables was accomplished in Yakutia in 2006 with the installation of a second-hand German wind power generator in Tiksi. The equipment did not work in extreme cold and storms. Solar installations started in 2011 with a successful 10 kW facility test; most parts of Yakutia receive string sunlight during March-October. A new unit of Sakhaenergy screened all diesel-electric stations across Yakutia to determine suitable locations and capacity for future solar plants. By 2016, the total renewable installed capacity reached 1514kW/h.

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In the widest sense, the relevance of the ecological dimension to Russian actors boils down to the extent to which the sustainability frame shapes the organization of Russia's resource sector and its heavy industry. There are very few signs of Russia turning to a more post-industrial or more services-

oriented economy (World Bank 2016). Hence we expect continued reliance on the fossil fuel and heavy industry sectors. Therefore it matters greatly how the Russian actors negotiate the structures shaping development in these sectors.

We will next discuss the structuration of Russian diversification efforts in the wider industrial sectors. While in the fossil fuels sector we found narrow or within-sector, as well as geographical diversification efforts, here some further diversification paths will emerge.

2.3 The structuration approach: diversification in manufacturing

The two fundamental antinomies of Russian modernization relate to the role of fossil fuels as both blessing and curse, as well as the contradiction between the neoliberal vs. developmental state model. We will now discuss how competing actors and interests in Russia relate to these debates and 'negotiate' the associated structural constraints, before moving to the results of diversification policies. Specifically, we will address the emergence and evolution of Russia's development model in terms of major turning points, or critical junctures structuring Russia's modernization choices: the first one around 2004, and the second one after 2014. The change in oil prices was a necessary, but not sufficient, condition in each case.

Since the early 2000s, the increased income from commodities afforded new investment possibilities to the Russian government (Sapir 2015). The Stabilization Fund was introduced in 2004 to maintain macroeconomic stability against inflationary and appreciation pressures associated with oil and gas exports. However, since 2007 the Fund's resources have been used to finance new development institutions, thus marking a shift to more development-oriented economic policy (Dabrowska and Zweynert 2015, Zweynert and Boldyrev 2017). This new orientation supported the emergence of strategic planning in Russia. For example, the government's strive to develop industrial strategies increased budget funding for industries capable of operating within the framework of the public-private partnerships (Kolpakov 2010). This shift was a result of compromises within the Russian government between 'liberals' and 'interventionists' (Sapir 2015, Lowry 2016). This allowed for the measured use of the Fund for investments in the Russian economy without creating large macroeconomic imbalances. Yet, contradictorily, these industries were penalized by the liberal policies of high interest rates and an overvalued real exchange rate for the ruble (Lowry 2016).

The Russian government proposed changing Russia's economic growth model from a resource-oriented to 'innovative and socially oriented type of development' in the document 'Concept of Long-Term Socio-Economic Development of Russia up to 2020', published in 2008 (hereafter, the Concept–2020). More fine-tuned strategic documents and laws[iv] signified the evolution of strategic planning (Monaghan 2014). The state initially sought to re-structure the economy by means of top-down consolidation of the capital-intensive, strategically-important high-technology industries, forming state holdings such as Russian Technologies, Rosatom, United Aircraft Corporation (UAC) and United Shipbuilding Corporation (USC). With a subsequent bottom-up approach, the government tried to encourage innovation by means of greater interaction with business and the scientific community, particularly at the regional level. In addition to special economic zones, launched in 2005 and aimed at the development of high-technology industries,[v] the government has utilized the instruments of technological platforms and innovative technological clusters.[vi]

Since 2014, the economic sanctions and lower oil prices have spurred Russia's longstanding diversification debates (World Bank 2016: 52). There is an ongoing shift toward a broad

diversification strategy, which reinforces the earlier shift toward a more development-oriented economic policy. The key enabling factor during this period is the depreciation of the ruble, which gives Russian firms a comparative advantage in global markets and could help Russia diversify its export profile away from fossil fuels and other primary commodities (ibid: 53). However, the constraints Russian firms need to overcome in order to be competitive on the global market range from product quality and innovation capacity to compliance with international standards. The Russian government has undertaken legal and institutional reforms to boost exports, such as roadmap for the 'Support for Exports and Access to Foreign Markets' (2012) and programme on 'Development of Foreign Economic Activity (2013-2018)'.

Further measures seek to boost domestic production of certain commodity groups and product types. The Government Commission on Import Substitution was established in 2015 to ensure consistency among federal and local authorities. Import substitution has contributed to increased output in agriculture as well as some manufacturing industries, and has helped to increase the production of investment goods including machine-building and electronic equipment, partially reducing the dependence on technology imports (WTO 2016: 18).

To assess Russia's diversification choices vis-à-vis the policy environment, we need a more nuanced idea of the structure of the manufacturing industrial sectors. Previous studies have identified three general factors that determine competitiveness and location choices in manufacturing: 1) the total costs consumed by factor inputs – labour, capital, and raw materials, including energy; 2) the degree of innovation; and 3) tradability (Manyika et al. 2012: 44-45). On this basis we will discern three broad manufacturing groups that have been the main focus of Russia's diversification efforts – global innovation for local markets, energy-/resource-intensive commodities, and global technologies/innovators (Table 2). The two groups that we do not cover in this classification are regional processing and labour-intensive tradables. We discuss these primarily in the context of small entrepreneurship (Text box 2). Most of such economic activities are small-scale and not export-oriented. Although food and agriculture have been the focus of Russia's counter-sanctions and import substitution policies more broadly, we can only briefly address these developments in the following sections.

Group	Industry	R&D Intensity	Labour Intensity	Capital Intensity	Energy Intensity	Trade Intensity	Value Density
Global innovation for local markets	Aerospace						
	Shipbuilding						
	Automotive						
	Pharmaceutical						
Energy-/ resource-intensive commodities	Nuclear						
	Refined petroleum						

Global technologies / innovators	Computers and office machinery						
	Semiconductors and electronics						
	Medical, precision, optical						

TABLE 2.2 RUSSIA'S DIVERSIFICATION EFFORTS IN MANUFACTURING
Source: ADAPTED FROM EXHIBIT E3 (MANYIKA ET AL.2012, 5)

It is important to note that these groups roughly correspond to narrow, resource-intensive, and broad diversification categories we discussed in the introductory section. In other words, they are based on three different diversification strategies. However, we do not suggest that these are mutually-exclusive choices. On the contrary, we find that efforts to diversify Russian economy have been pursued in all three directions.

The first strategy entails modernizing lagging priority sectors that form the core of *global innovation for local markets*, focusing specifically on such industries as aviation, shipbuilding, automotive, and pharmaceuticals. The second strategy falls in the category of narrow diversification, and is based on Russia's existing comparative advantage in the resource sector. It entails moving up the value chain in this sector concentrating efforts on *energy- and resource-intensive commodities*, specifically in such industries as basic metals, refined petroleum, and the nuclear industry. The third strategy involves building a knowledge-based economy with an emphasis on *global innovative technologies*, focusing on the ICT, medical, precision, and optical industries. With respect to the diversification of markets, we can note that these three industry groups entail different extent of geographical diversification. Specifically, the first two groups of industries, global innovation for local markets and resource-intensive commodities, do not depend on global R&D and production networks to the same degree that the third group, global innovative technologies, does. Their production facilities are located close to customers and rely on established supply chains. Consequently, these industries are more attuned to the development of domestic and regional markets.

2.3.1 Global innovation for local markets

This is the largest manufacturing group globally comprised of diverse industries, which are moderately to highly R&D-intensive and rely on innovations. Beyond that, their ability to generate profits depends on minimizing costs. Therefore they locate production facilities close to customers to optimize supply chains, and prefer favourable regulation and government intervention policies (Manyika et al. 2012, 53). None of these factors were favourable to Russian industries from the 1990s to the mid-2000s. The forced disintegration of scientific-production associations in the 1990s broke cooperative ties between science, design, and production (Gel'vanovskiy et al. 2013, 50; Lowry 2016, 131). Further constraints included the disruption of industrial ties with former Soviet republics and a sharp drop in demand with a deteriorating standard of living and drastic cuts in domestic procurement.

Since the 2000s, government policies successfully supported many strategically-important industries. The state consolidated companies into state holdings in such struggling industries as aviation and shipbuilding (Text boxes 3, 4). It also persuaded global industry leaders to localize in Russia and creating partnerships with domestic firms, most noticeably in the automotive industry after the 2009

crisis. With import rates for parts reduced to zero during a transition period, automotive production capacity grew overal 43% from from 2007 to 2012, including 146% in new production facilities (Boutenko et al. 2013); however, localization requirements went up from 30% in 2005 to 60% in 2011 (Gill et al. 2014, 21). Production of medicines in Russia's pharmaceutical industry grew over 60% from 2013 to 2017 (Deloitte 2018). The government's programme seeks to produce domestically up to 50% of the country's pharmaceuticals by 2020 and 90% of the most important medicines by 2018 (Labykin 2016). The new investment boom is driven by domestic pharmaceutical companies and the second wave of foreign enterprises' localization.

Text box 2: Aviation

Anna Lowry

By 2000, the problems accumulated in Russia's aviation industry were too large for the government to ignore, yet repeated attempts to reform a struggling industry often fell short of stated objectives (Zaiko 2005). By the turn of the millennium, Russia's share in the world civilian fleet declined to 2%. By comparison, in the late 1980s the USSR accounted for about a quarter of the world's civil aircraft and 40% of military aircraft (Miranovsky 2013).

The aviation industry is one of the key priorities of Russia's industrial policy. In 2008, the total federal funding of this industry increased by more than 10 times, compared to 2004. With the inclusion of the anti-crisis measures in 2009, it was 20 times greater than in 2004 (Interfax, 2009). A key objective of the national civil aviation industry is to preserve the competence of a system integrator. At the same time, the government's industrial strategy seeks to make the civilian aircraft industry the primary income-generating sector in place of military aircraft production. The federal programme "Development of Aviation Industry in 2013-2025" sets the goal of "creating a highly competitive aviation industry and securing its position in the global market as the third [largest] producer," after the US and EU (Gosudarstvennaya Programma 2012a). The programme calls for a three-fold increase in both the total revenue of domestic producers and Russia's share of the global market by 2025, supported by a 991 billion rubles government investment to stimulate the industry (Labykin 2014). The goal is for Russia's share of global civilian aircraft market to rise to 3.6% in monetary terms from the 1.1% in 2011, while its share of the military aircraft market should not exceed 11.9% (12.5 % in 2011).

One of the main measures to jumpstart Russia's civil aviation was the creation of the United Aircraft Corporation (UAC) in 2006. The consolidation of main assets in the aviation industry is completed. Russia's main aircraft design bureaus, including Sukhoi, Tupolev, Ilyushin, and Yakovlev, as well as production facilities have been merged into the 85.3% state-owned UAC. UAC's progress was initially very slow despite considerable state investment, prompting the government to intervene and appoint a new management team (Hobson 2016).

Despite the enormous constraints and path-dependencies involved in reviving Russian civilian aviation industry, UAC has significantly contributed to the realization of the government's industrial objectives. From 2008 to 2014, the number of aircraft delivered by UAC increased from 53 to 159, with the compound annual growth rate (CAGR) in both revenue and deliveries at 20%. The civil aviation segment is the main driver of growth in deliveries, in particular the SSJ-100. The share of civil aviation in total deliveries increased to 26% in 2013, compared to 11% in 2008. Finally, for example the CityJet deal, which allowed Russian Superjets to break into the European market, and the introduction of the MC-21 suggest that Russia's airliner industry might be finally taking off (Hobson 2016; Zhang 2016; Grachev 2016).

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2.3.2 Energy-/resource-intensive commodities

The competitiveness of this group likewise depends on transportation costs, infrastructure, and proximity to demand. In addition, these industries need access to raw materials and reasonably priced energy (Manyika et al. 2012, 59). However, Russia's rich natural resources enable such a strategy, supporting the narrow diversification options advocated by many economists on the way towards broader diversification. Because the average productivity in energy- and resource-intensive industries in Russia – basic metals, refined petroleum, and nuclear materials – far exceeds productivity in other industrial segments, minimal state support would enable the creation of globally competitive national champions (Ivanter, Kudiarev 2015).

The nuclear industry is a priority for the Russian government. With high fossil fuel price volatility and expectations of meagre or stalling growth of oil production in particular (Simola and Solanko 2017, 5-6), developing the nuclear industry reduces the country' vulnerability to external shocks and offers new sources of income (Absametova and Vinokurov 2011). Russia's state nuclear corporation Rosatom is globally-competitive, controlling the entire process chain from uranium processing to the construction of nuclear power plants. The government seeks to expand its market share and to facilitate economic integration of nuclear industries within the EAEU, specifically between Russia and Kazakhstan (Absametova and Vinokurov 2011; Gel'vanovskiy et al. 2013, 46-47; Glazyev and Tkachuk 2015, 74).

2.3.3 Global technologies/innovators

Companies from advanced economies dominate this group, including the computer and electronics industries. It depends on global R&D and production networks, and is highly traded because of the high value density of products, the high degree of modularity in components, and the fragmented value chains (Manyika et al. 2012, 61). Firms need to combine innovations with low labour costs for assembly, which is challenging for Russian companies.

The policy of import substitution after the onset of sanctions and the rouble devaluation of 2014 supported the previously-neglected Russian global technology industries. With the sharp increase in the price of foreign equipment in 2014/15, the practice of developing domestic analogues of various foreign technologies and devices continues. This not only strengthens Russia's technological independence but also serves the interests of sovereignty. Within this group we find Russian processors – Elbrus (produced by MCST) and Baikal (T-Platforms), domestic CNC machines using them, serial servers with Elbrus instead of Intel, new microelectronics for the space and defence industry, Russian additive technologies, as well as engines, robots and unmanned vehicles, automated control systems, and software solutions (Belkin 2017). In the medical sector, the Russian company ExoAtlet has a device in serial production that helps restore walking skills in patients with various injuries. Russia is among the top five countries that independently produce such devices (Belkin 2017).

We will now proceed to assessing the diversification choices in the manufacturing industries vis-à-vis the policy environment. This will help us to discern the balance of the assets Russian actors possess, and the constraints they encounter when promoting their interests and the strategic objectives set by the state.

2.3.4 Resources, technology, and infrastructure dimension

The greatest constraints relate not to the resources *per se*, which are abundant, but to their use. This refers to operational disadvantages, including rent-seeking and the effects of various reforms. Western literature often emphasizes Soviet legacies, as well as the mismanagement of resources,

resulting from the clientelistic rent management system (e.g., Baev 2013; Gaddy and Ickes 2013). Russian scholars in turn criticize post-Soviet reforms, their underpinning neoliberal ideology, and the tightening global competition. Over the last 20 years, Russia's resource base has significantly deteriorated. This leads to high prices and tariffs for raw materials, electricity and monopoly services, depreciation of production assets, falling qualifications of workers, and emigration of scientists (Gel'vanovskiy et al. 2013, 38). For liberal economists, these problems stem from the underlying institutional constraints including corruption and lack of trust in government. Their critics suggest that the reform should have taken an *a priori* account of institutional conditions (Chang 2003; Rodrik 2006).

Several policies have sought to promote technological modernization and embed it in broader goals of economic development (Autio-Sarasmo 2016). The state programme 'Digital Economy' outlines measures until 2025 (Grammatchikov 2017). Several regulatory initiatives have sought to create an environment more conducive to innovation (Vercueil 2014, 500-501). Some technology experts lament that such attempts fail to link up with a more general strategy of industrial development,[7] leading to internal contradictions and competition between projects. This returns us to the interconnectedness of the various economic sectors, which calls for a more coherent and integrative approach (cf. Grammatchikov 2017).

The policies for technological modernization have created three systems. Firstly, early modernization efforts focused on addressing accumulated problems in traditional high-technology industries with strong Soviet legacies, culminating in the creation of state-owned enterprises (SOEs) in these sectors (Lowry 2016). These continue to play an important role in Russia's economy. Secondly, Medvedev's modernization programme emphasized technology transfers and international interaction (Autio-Sarasmo 2016, 84) to improve domestic technology and Russia's economic 'backwardness'. This resulted in pockets of expensive foreign technologies imported in exchange for oil and gas rents. Thirdly, despite previous import substitution programmes existing since the 2000s, goods based on domestic R&D only became a priority by 2015, due to the sanctions and the ruble devaluation of 2014. Overall, dependence on imported components reaches up to 80% in some industrial sectors, almost as high as in the case of fossil fuels (Korolyeva and Rogozhnikov 2016).

To support the domestic industry and production while reducing Russia's dependence on imports, the government launched a high-profile import-substitution policy in January 2015 (Connolly and Hanson 2016; Rutland 2016: 6; Oxenstierna 2015c, 92). This policy is allegedly the largest-scale programme of industrial recovery since the Soviet era (Kichanov 2015). It is also a measure for bolstering Russia's economic sovereignty interest when tensions with the West arise and Russia's economic growth is sluggish (Connolly and Hanson 2016; Rutland 2016, 6; Oxenstierna 2015c, 92). This policy envisages the implementation of 2,059 projects in 19 branches of the economy between 2016 and 2020. Its cost estimate is 1.5 trillion rubles, of which only 235 billion rubles are to come from the federal budget. In a recent poll, the majority of Russian civil servants (79%) consider this policy reasonable given the external structural constraints (Kichanov 2015). At the same time, they note the forced and belated nature of this policy, its limited funding, and limited time for reforming and implementing regulation. A balanced assessment of the import substitution policy would require several years of monitoring, given the long production cycles in manufacturing and the financial constraints, including exchange rate volatility and high interest rates (Korolyeva and Rogozhnikov 2016). For example, enterprises choosing this difficult path cannot cover the required 20% of the investments, given the high refinancing rate of the Central Bank.

Insufficient infrastructure seriously hampers the business frame in the industrial sectors of the economy. Large-scale reconstruction of infrastructure requires a stronger project finance market. In

2011-2016 more than 14 trillion rubles or 19.2% of GDP was invested in transport and energy infrastructure alone. After the peak in 2013, infrastructure investment fell by 20% (at current prices) over the next three years to 2.15 trillion rubles, due to the economic crisis as well as the completion of the investment programme in energy generation (Obukhova and Ivanter 2017). The government has tried to attract private capital to infrastructure sectors, with few results. Some infrastructure projects, usually structured as concessions, are financed using project bonds. In this narrow market, the non-state pension funds (NPFs) of companies managing the projects play a major role.

Business analysts recommend securitization or issuing securities to the open market so that resource-supplying organizations and banks investing in modernization at the first stage can receive more return, release capital, and reinvest. A more developed financial market would also allow people to benefit directly through coupon yields from the issued bonds. As a precedent of successful large-scale securitization in Russia, experts point out the mechanism for buying out mortgage loans and issuing securities for them by the Agency for Housing Mortgage Lending. At the St. Petersburg International Economic Forum 2017, President Putin called for developing an infrastructure mortgage mechanism, subsequently instructing the government to draft proposals for developing a public-private partnership (PPP), to regulate transactions on syndicated lending in cooperation with the Central Bank, and to prepare a plan for deploying project financing together with the Central Bank and Vnesheconombank (Obukhova and Gaiva 2017). Finally, the Central Bank is currently considering the idea of concession bonds, which would allow people to invest in specific projects.

2.3.5 The finance, markets, and business models dimension

The lack of investment is a major constraint to developing Russia's assets. Some refer to chronic underinvestment.[8] Others refer to misinvestment and to the existing, inefficiently located 'capital-labor bundles' that are legacies of the Soviet economy (Gaddy and Ickes 2013, 12). From the early 2000s to the crisis of 2008-2009, Russia enjoyed an 'oil credit expansion' *(neftyanaya' kreditnaya ekspansiya*) and excess liquidity (Fadeev 2016). The state subsidized projects either directly from the budget or through state development institutions (Obukhova and Gaiva 2017). Western scholars commonly criticize the fact that these resource rents ended up as subsidies to uncompetitive manufacturing sectors. The counter-argument is that Russian manufacturing was actually starved of investment, as much of the excess liquidity ended up on the accounts of commercial banks feeding the speculative bubble (Sivakov et al. 2006).

Furthermore, part of the rents were 'sterilized' in stabilization and reserve funds buying US bonds. Hence, restrictive monetary policy and increasing foreign exchange reserves led to higher interest rates than the profitability of domestically-oriented industries would have warranted. The shortage of long-term credit was partially replaced by foreign sources available only to large export-oriented and trade enterprises. This for its part led to uncontrolled growth of external debt and the external dependence of the Russian financial system (Glazyev 2013).

Firstly, cuts can deepen the crisis although wages, pensions, and military spending were exempted in 2016 (Rutland 2016, 6; Adamchuk and Mereminskaya 2015). The Ministry of Finance favours a restrictive budget to keep inflation low and the exchange rate and business expectations stable.

Secondly, the government used the Reserve Fund and the National Wealth Fund to cover the deficit. The Ministry of Finance also used the Reserve Fund to support the falling ruble. After receiving foreign currency from the Reserve Fund, the Ministry of Finance sells it on the market and proceeds to allocate rubles. In 2015 alone, it spent 500 billion rubles (just under $8 billion) (Adamchuk and Mereminskaya 2015). Critics think that the Central Bank's active interventions in the foreign exchange market to support the ruble not only led to the expenditure of gold and foreign exchange

reserves, but also removed the ruble money supply from the economy, which exacerbated the crisis (Blinov 2015).

Economic decision-makers commonly argue against issuing government bonds to the domestic market as it will reduce liquidity, wash away money from financial markets and, as a result, raise the already inadmissibly high interest rates (Fadeev 2016). In this 'crowding out effect', the budget draws on itself the money of the private sector, thereby squeezing the growth opportunities of the latter (Ershov 2016). Critics, while not disagreeing, also point out that domestic public debt in reasonable amounts is in fact one of the pillars of the modern economic system of any developed country. For example, in the US and Japan, government securities account for 80-90% of the entire issue (monetary base) of the national currency. By comparison, the share of Russian government securities in the issue of the ruble at the end of 2015 was less than 5%. Russian regulators are slowly accepting the need for a budget deficit and financing it by means of government securities and even the use of long-term securities (up to 30 years). However, Russia does not use the Central Bank as a buyer of such securities for various reasons,[9] which are often unclear to the broader Russian expert community.

The markets for Russia's manufactured goods have a diverse geography. As of 2016, the main importers of Russia's high-technology products were: 1) Kazakhstan, 2) Belarus, 3) China, 4) Ukraine, 5) India, 6) Germany, 7) USA, 8) Iran, 9) Uzbekistan, and 10) Poland (Shurygin 2017). This is consistent with the Russian policies on technological convergence and integration within the EAEU to increase competitiveness (Gel'vanovskiy et al. 2013, 11) and 'to maximize connectivity with all' (Trenin 2017). However, Russian liberals would rather operate through major international trade agreements, primarily the WTO, to support non-primary exports. Their critics favour bilateral agreements and privileged partnerships (Remizov 2017). For example, any Russian barriers for the products of Boeing and Airbus are unlikely to alarm the potential buyers of Russian Sukhoi Superjet or MS-21 aircraft. In problematic industries, such as shipbuilding, returning Russian customers would set the foundation for increasing the industry's global share.[10] In other words, the critics call for a careful and nuanced approach to trade policy considering the specificities of individual industries as is the global practice. Such an industry-level approach may yet emerge with the slogan 'from import substitution to export' and respective initiatives. Although Russian exporters deem some of these initiatives as merely declarative, they, especially SMEs, support the regional export support centers launched by the Ministry of Economic Development (Shurygin 2017).

Russia's high-tech exports will require new business models. Apart from some high-tech industries (space, nuclear energy, defence industry, and software), Russian companies and their governing authorities need to work hard to create new demand for their products. According to the head of the Russian Export Center (REC) Petr Fradkov, focusing on supply is more familiar for most Russian companies than widening demand (Korolyeva 2017). Moreover, most Russian SOEs, which dominate its high-tech areas as well as utilities and infrastructure, do not have a system of long-term technology planning (Gershman et al. 2016). Corporate foresight and technology roadmapping tools are uncommon.[11] Since 2011, the largest SOEs are obliged to develop innovation development programmes (IDPs).

Historical legacies explain some of these constraints. Neither economic development nor re-industrialization could realistically begin until the 2000s. Throughout the 1990s, Russian enterprises struggled to survive while the state's R&D investments were low. This lost decade widened the gap with major competitors. Yet, one successful example is the Sukhoi Superjet, 'born in the destruction of the 1990s', yet international and 'cutting edge' (Hobson 2016). It was built by a design bureau that only made warplanes before, while Russia had little experience in exporting aircraft. Its competitors had trust in the market, better service and maintenance networks, as well as financial export

infrastructure. The expertise created with the Superjet project has benefited the development of the MS-21 plane (ibid.).

2.3.6 Institutional dimension

The government's economic strategies have stressed institutional reform. Russian economic experts disagree on monetary policy but agree on reforms in taxation, tariffs, the judicial system, and a foreign economic policy based on maximum openness and reset of relations with the West (RIA Novosti 2016). Important differences nevertheless prevail in priorities and emphasis on economic – as opposed to political – reforms. Alexei Kudrin, former Minister of Finance (2000-2011) who heads the Agency for Strategic Initiatives (ASI), suggests that economic reforms in Russia presuppose political and institutional reforms. His opponents in the Stolypin club counter that creating such institutions takes several decades. They would prioritize developing markets first, by increasing the number and strength of economic agents. This would lay the foundation for subsequent political and institutional reforms (Titov 2016).

Other economic experts, however, deem institutional reforms too narrowly conceptualized in strategic documents (Polterovich 2017). They are equated with the reduction of corruption, the share of the shadow sector and administrative barriers, increasing business transparency, and strengthening property rights. However, as critics point out, path-dependencies at the level of civic culture and informal institutions thwart progress in this area. For the same reason, control and coercion are costly and ineffective. Further, the quality of institutions, understood narrowly as those associated with the competitive market, is neither a necessary nor sufficient condition for economic development. At the same time, numerous studies demonstrate that countries succeeding with an 'economic miracle' relied on developmental institutions instead (*instituty dogonyayuschego razvitiya*, or IDR, in Russian terminology). These typically include a Federal Development Agency, indicative planning, a national innovation system aimed at borrowing new technologies, and a corporatist system of administrative management. Developmental institutions initiate economic growth and thus simultaneously accelerate the evolution of civic culture, creating the conditions for improving the institutional system, including property rights and the reduction of barriers to market entry (Polterovich 2017).

Developmental institutions are responsible for the formation and implementation of large-scale projects to improve the technology and organization of the national economy. The Federal Development Agency leads this process, ensuring the harmonization of socio-economic policies with institutional reforms. As a rule, this agency is subordinated directly to the head of government, which facilitates the coordinated work of the ministries. Proponents of the developmental state approach point out that in the absence of such an agency in Russia, there is a constant tug-of-war between the Ministry of Finance, the Ministry of Economic Development, and the Central Bank (Polterovich 2017). The Stolypin club's proposal to create 'reform headquarters' on the basis of the Council for Strategic Development and Priority Projects under the President (an analogue of a Federal Development Agency) seeks to move in this direction. However, critics see it as a rather soft measure aimed at avoiding the resistance from ministries fearful of losing some of their powers. This debate remains unsettled, yet crucial. Nevertheless, discerning the changes in Russia's developmental institutions and economic governing structures could also yield a more balanced understanding of Russia in the West, since the most contemporary theoretical approaches overlook the long-term perspective in Russian policymaking (Monaghan 2014). Simultaneously they neglect the Russian state's developmental agenda, viewing it as failed or irrelevant (Wengle 2012: 103).

The evolution of the governing structures reflects the government's changing policies on economic modernization. The government established the Council on Strategic Development and Priority Projects in 2016, following the creation of the Economic Council in 2012 and preceded by the

Presidential Commission on Modernization and Technological Development established in 2009 under Medvedev. The Council on Strategic Development and Priority Projects is a governing body, whereas the Economic Council Presidium, established in October 2013, is a consultative body under the President of Russia. These governing structures diluted the influence of the Agency for Strategic Initiatives, a 'para-institutional' body linking the authorities and business to improve the implementation of instructions (Monaghan 2014, 18). Overall, the reformed institutional framework of Russia's R&D and innovation system features at least 30 initiatives in public regulation alone (Vercueil 2014, 500). Furthermore, within the framework of the Eurasian Economic Union, the Eurasian Agency for High and Knowledge-Intensive Technologies seeks, selects, and finances high-technology projects in the Eurasian Economic Space (EES). The agency is to combine the functions of the fund for direct knowledge-intensive investments and the technological bank of the EES (Ulyukaev and Sheryai 2014, 38; Gel'vanovskiy et al. 2013, 6).

The Russian leadership has consistently committed to strategic planning under Putin (Monaghan 2014, 8). This involves three phases: 1) the Strategy 2010; 2) the Concept 2020; and 3) the Strategy 2020, including the 'May Decrees'. More than two dozen strategies for specific industries have been adopted (Ogorodnikov 2017). The Ministry of Industry and Trade formulates industrial development strategies with interested industrial associations participating. This global trend on renewed industrial policy is also visible in the EU and the US (Aghion et al. 2011; Radosevic 2009). In December 2014, Russia adopted the federal law 'On Industrial Policy in the Russian Federation' (488-FZ 2014). However, studies suggest that the strategic aspect of competitiveness is weakly developed in Russia and the EAEU. Existing industrial strategies are insufficiently integrated into the overall development programme and coordinated with the development programmes of other EAEU members. A common strategy for the EAEU is still to be developed (Gel'vanovskiy et al. 2013, 39).

Many Western scholars see the recent shifts in Russia's economic policy as a return to the Soviet practices of centralized allocation of resources (Connolly and Hanson 2016). Russian economists instead point out that the challenge is to navigate successfully between the Scylla of neoliberal market fundamentalism and the Charybdis of straightforward *dirigisme* or varieties of developmentalism (Polterovich 2017). The limitations of neo-liberalism are widely ignored in Western research on Russia, which regards the developmentalist directions in Russia's economic policy as subordinated to efforts to protect Russia's sovereignty from internal and external threats. However, the domestic expert and business community widely supports these measures, which they associate with market realism and pushback against the ideological dominance of neoliberalism. For them, competitiveness encompasses both efficiency and security (Gel'vanovsky et al. 2013). They also suggest that technologies cannot be regarded as freely traded commodities or assets. Instead, they represent a fundamental competitive advantage, the use and transfer of which is controlled not only by owners but also by states, international organizations, and integration associations.

2.3.7 Ecological dimension

This dimension sets international level constraints in climate policy through the Kyoto Protocol and the 2015 Paris Agreement, which nonetheless leave considerable room for maneuver given their non-binding nature. At the same time, Russia's strategic priority is to reduce the energy intensity of GDP by 40% by 2020 through energy saving, improving efficiency, while policy measures to support renewable energy also exist (WTO 2016, 12). However, there are overlapping and often conflicting goals of energy efficiency and conservation on the one hand, and industrial competitiveness on the other. This can be illustrated by the lack of consensus among Russian business on green initiatives such as a carbon tax.

Russian business elites disagree over Russia's role in GHG emissions control. In November 2015, several major Russian companies (including Rusal, Sberbank, Rusnano, RusHydro, and Ingosstrakh) created the Russian Partnership for Climate Conservation. Later, VTB, Alfa-Bank, Alrosa, the European University in St. Petersburg and several other companies and organizations joined the partnership. The driving force behind the partnership, the head of Rusal Oleg Deripaska, advocates a global carbon tax of at least $15 per ton. Representatives of ferrous metallurgy, the mining sector, traditional energy, and the chemical industry are against. In June 2016, after heated discussions, the Russian Union of Industrialists and Entrepreneurs passed a letter to President Putin, stressing that Russia had already exceeded its target to reduce emissions to 70-75% of the level of 1990 by the year 2030, reaching 58%. The letter cited negative impact on socio-economic development and the competitiveness of many industrial sectors, and resisted carbon tax (Ivanter and Kudiyarov 2017). The contradictions of this dimension include the recognition of green energy and innovations in energy conservation as being promising areas of investment (Gel'vanovsky et al. 2013, 37); and skepticism toward such initiatives regarding Russia's position in these already highly-competitive markets. With its high cost of capital, Russia's economic interests pertain to the *least* capital-intensive decisions, taking into account the risk of acquisition, and the need to protect its own technologies. This fundamentally differs from economies with low cost of capital such as the US and EU, which can better apply capital-intensive solutions (Ivanter and Kudiyarov 2017).

2.3.8 Diversification in manufacturing: preliminary results

Our analysis has focused on Russia's diversification efforts with respect to three broad groups within the manufacturing industry. The study of Russia's industrial policy, which admittedly is still in its infancy (Connolly 2016; Simachev et al. 2014), finds significant progress in the automotive and nanotechnology industries, and an overall trend supporting a more innovative and diversified developmental economy. However, local achievements in certain sectors are not reflected in the economy's macrostructure (Simachev et al. 2014, 16). Manufacturing on the whole also failed to register much growth from 2013 to 2017 (World Bank 2018: 9). Our analysis contributes to this literature by covering a wider range of industries and reveals a more dynamic picture than is evident in the macrostructure. In addition to the globally-competitive nuclear industry, which the government has sought to leverage for the overall modernization of the economy, the pharmaceutical industry, for example, has progressed. Significant progress also exists in such struggling sectors as civil aviation and shipbuilding, as well as electronics, previously dominated by foreign producers. The agricultural sector, promoted as a major exporting sector, has witnessed substantial output increases since 1998 and is spurred by Russia's counter-sanctions. For example, Russia has become a leading wheat producer (Dufy and Sindzingre 2016, 78; Liefert et al. 2009).

As indicated, these industry-level results are not directly reflected in the broader Russian economy. The share of extraction vs. processing industries in gross value added is one of the most straightforward indicators of diversification. Whereas the proportion of extraction industries as a percentage of gross value added shows an upward trend, the share of processing industries has been declining since 2002. The growth in the extraction industries results from high commodity prices in the external markets, while processing industries are generally geared towards the domestic market (Simachev et al. 2014, 16). At the same time, the share of innovation in total output has increased during the 2010s, while no growth in the proportion of research-intensive or high-tech sectors has occurred (Simachev et al. 2014, 16).

Nonetheless, several diversification trends are discernible. The share of natural resources rents in GDP declined from 21.6% in 2000 to 10.3% in 2015 (Figure 2). The large share of oil and gas exports also started to decline since 2014, despite remaining predominant. In 2013 (the peak year), fossil fuels accounted for 70% of Russia's exports but only 59% in 2017 (World Bank 2018, v). Crude oil, oil

products, and natural gas remain by far the most important exports. Yet significantly, the value of oil exports declined twice as fast as that of other products between 2012 and 2014. The decreasing global prices since 2014 further reduced their value from over $350 billion a year, to around a half by 2015. The values of machinery, equipment, processed timber, and aluminium were most resistant to these negative trends and were boosted by Russia's import substitution policies. However, Russia's exports to advanced economies remained oil- and natural gas-dominated, while its markets in the former Soviet neighbours, Asia, the Middle East, and northern Africa were more diversified (World Bank 2016, 58-61).

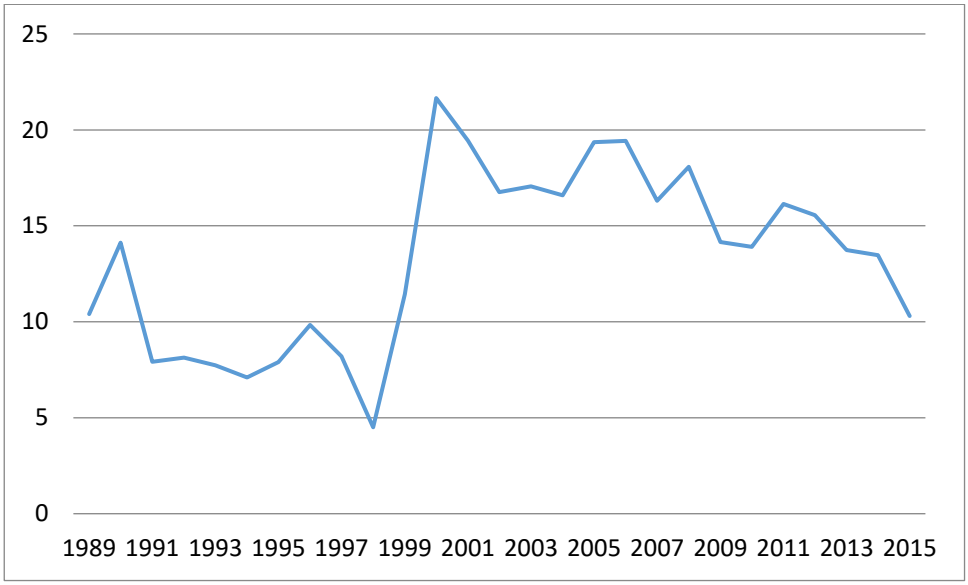

FIGURE 2.2 RUSSIA'S TOTAL NATURAL RESOURCES RENTS[12] (% OF GDP), 1989-2015

Source: WORLD BANK (2017)

In 2015, exports to the EU still constituted 46% of Russia's total exports, most of which was oil and gas (World Bank 2016, 55-59). Overall, apart from fossil fuels, metals, machinery and equipment, as well as chemicals, rubber, wood and related forestry industry products top the export rankings (World Bank 2018, 8-9). The value of machinery and equipment stood at some $25 billion in 2015. Russian arms exports are not reported in official statistics but were, depending on estimate, between $9 and $14.5 billion, or some 3-4% of Russia's exports (Connolly and Sendstad 2017, 6, 22). By 2015, the leading Russian agricultural products overtook arms as a total share of exports (FT 2017). While the depreciation of the ruble and trade restrictions ensuing from Russia's own countersanctions made Russian agricultural products more competitive, institutional choices made in the 2000s supported foreign direct investment, allowed private investment in land, and offered subsidised credits and tax breaks to farmers, as well as improved infrastructure (Wengle 2017; Russia insider 2015).

The predominance of oil and natural gas exports to the EU market makes Russia vulnerable to both falling global oil prices and decelerating growth in Europe. The diversification policies have sought to expand exports to the EU beyond oil and gas (i.e., product diversification), alongside a geographical diversification towards Asia. Oil and gas exports to China and the rest of Asia more than doubled from 2008 to 2014. Other exports to Asia increased as well, but at a much slower pace (World Bank 2016: 59). With respect to product diversification, some non-traditional exports have

grown at above-average rates, although most of these are still primary commodities and intermediate goods (World Bank 2016: 56; 2018, 8-9).

From a long-term perspective, Russia has periodically developed new export products and entered non-traditional markets, but it has struggled to sustain non-resource exports to countries outside the former Soviet Union. Hence, a dual export structure has emerged, where a relatively diverse and stable mix of exports to traditional regional markets coexists with a highly concentrated and vulnerable set of predominantly resource-based exports to new markets (World Bank 2016: 57). In terms of enduring path-dependencies, the dominance of oil and gas in Russia's export profile has over time eroded its overall economic competitiveness. Specifically, Russia's revealed comparative advantage (RCA) is predominantly in oil and gas and other primary commodities. At the same time, the number of Russian products with a positive RCA declined from 139 to about 100 during the 2000s. Moreover, Russia's comparative advantages are skewed toward sectors with limited competition and connectivity to the rest of the economy (World Bank 2018, 9).

2.4 Discussion

The basic thrust of our empirical analysis has concerned the viability of a fossil fuel-based model for Russia's modernization and its relationship to the broader goals of diversification of the economy. This is a persistent question in the Russian economic debate. At the same time, this debate is informed by the literature on the 'resource curse', developmentalism, as well as decarbonization/sustainability (Sachs and Warner 2001; Auty 1990; Karl 1997; Luong and Weinthal 2001; Zenghelis 2016; Perez 2016; Dufy and Sindzingre 2014; Wade 2018). Our analysis highlights the complexity of choices of Russia's economic modernization and the involved ambiguities. This complexity is evident in, firstly, the tensions between the commodity-dependent economic development model and a more innovative, sustainable and inclusive growth model. Russia's rapid economic growth since the millennium relies on the expansion of its participation in the global commodity and energy markets. However, the opportunities for economic growth in this sector have shrunk (Knyaginin et al. 2017). Can Russia successfully transition from the resource-intensive forms of mass production to a new pattern of growth in a global 'green' direction? Furthermore, to what extent are developmental polices compatible with commodity-based economic structures, and is Russia's re-industrialization sustainable in the long run?

These questions are crucial for Russia's economic modernization. While it is the task of the Russian actors themselves to try to resolve these dilemmas, we may here draw some preliminary conclusions as to where they are moving. Firstly, our analysis supports the general finding that Russia's current political economy is characterized by political consensus on developmental policies combined with a dualistic economy, which is both industrial and rent-based. This means that 'bureaucratic control over rent-based sectors coexists with sectors of rapid state-driven modernization' (Dufy and Sindzingre 2014). In other words, natural resources, per se, do not induce any 'curse.' While commodity production and exports tend to lower economic incentives to industrialize, it is the state institutional capacity that determines development paths and policy effectiveness (ibid.). In this regard, Russia's developmental capacities have been significantly weakened as a result of the destruction of institutions by 'shock therapy' in the 1990s (Dufy and Sindzingre 2014).

Secondly, our analysis extends this line of argument by suggesting that the duality of Russia's political economy is evident in more than one respect. While Russia's commodity-based economic structure is generally compatible with developmental industrial policies, its emergent

developmentalism sits uneasily with many features of neoliberalism. The Russian developmentalism has sought to push production into sectors with increasing returns while retaining a significant measure of national ownership. The import-substitution policies seek to replace sophisticated imports with domestic production in priority sectors. Finally, the state has bargained hard with multinationals to attract foreign direct investment, gradually raising local content requirements, most notably in the automotive industry. However, bureaucratic power in Russia is not centralized in the developmental state fashion. There is no Federal Development Agency or 'reform headquarters,' which results in a constant tug-of-war between the Ministry of Finance, the Ministry of Economic Development, and the Central Bank (Polterovich 2017). Also consistent with the neoliberal state model, the Russian state prioritizes low inflation, labour markets flexibility, and high integration with the international economy in terms of trade, investment, and finance.

Thirdly, while Russia has sought to promote sustainability interests by reducing the energy intensity of GDP through energy saving, improving efficiency, and encouraging the development of renewable energy, the Russian business community is divided on the control of GHG emissions. Green initiatives such as carbon tax face opposition from powerful industrial groups because of their alleged negative impact on socio-economic interests and profit interests of many industrial sectors. In the broader sense, while Russia has sought to align its strategic goals with global sustainability trends, it remains a passive taker of global norms. Russian leading conservative thinkers, in fact, question both the philosophical roots and practical implications of these norms in their critique of environmentalism and opposition to the post-industrial direction of economic development (Remizov et al. 2014).

We suggest that these apparent contradictions in Russia's economic development model are rooted in two fundamental antinomies of Russian modernization. These can be understood as tensions which define the structural constrains and action frames of various agencies in contemporary Russia. The first one relates to the ambiguous role of natural resources in Russia's economy or, specifically, the role of hydrocarbons as a blessing and a curse. On the one hand, the export of oil was the main generator of wealth in Russia in the 2000s, which enabled diversification policies in the first place. On the other hand, the dependence on global oil prices challenges Russia's traditional heavy industry.

The second antinomy pertains to the contradictory growth models of the neoliberal vs. developmental state model. Since the 1980s, the economic catch-up strategy of various inter-state organizations builds on integration with the international economy. This neoliberal strategy focuses on exchange, not production and presumes the international economy is a fully open system. Yet in practice, very few non-Western countries have become 'developed' over the course of the past two centuries (Wade 2018, 537). In other words, there is something analogous to a 'glass ceiling' or 'middle-income trap' in the world economy. At the same time, the experience of the East Asian economies suggests that a developing country can sustain upward momentum through the middle-income range by government activism beyond neoliberal limits. In this developmental state model, the government takes a much broader market-steering, 'societal mission' role which may or may not succeed (Wade 2018, 539).

Our results challenge two approaches that exclude the relevance of developmental state in Russian context. We do not see that the resource curse is a permanent essential feature of Russian development excluding the idea of the developmental state. This assumption is prominent both in resource curse discussion and in the discussion of the developmental state in Asia. We have three main points, which challenge this view that he/she takes as given. Firstly, the role of energy resources is both a curse and a blessing. This duality aspect is even more significant in the global context when the world is trying to get rid of the hydrocarbons. Secondly, the Russian elite seems to acknowledge this in their diversification policies, which focus both on the energy sector and on a comprehensive reindustrialization policy aiming at import substitution. And, as a third point, most of the influential

Russian think tanks emphasize some form of mixed economy. Based on this empirical evidence, we are inclined to argue that the antinomy between neoliberalism and developmental state is, indeed, significant in understanding contemporary Russia. Even in the conditions where the business elite and fiscal conservatism are inclined towards neoliberal policies.

Our analysis has emphasized these fundamental antinomies of the Russian modernization process, and how competing actors and interests in Russia 'negotiate' the associated structural constraints. Specifically, we discussed the emergence and evolution of Russia's development model in terms of major turning points structuring Russia's modernization choices, both of which were related to changes in oil prices. In terms of our structuration theory, we observe how a key structural factor such as a price advantage was linked to the rouble's depreciation, and was simultaneously shaped by prior foreign policy choices, facilitating a shift toward a broad diversification strategy. In turn, this reinforced the earlier shift toward a more development-oriented economic policy. This shift has also been facilitated by the narrowing of the available policy choices since 2014, which has heightened the vulnerabilities and risks associated with up-to-now viable resource-driven growth model. The risks pertain not only to the resource orientation of the economy per se, but to an entire spectre of neoliberal policies, which according to their critics make the Russian economy highly vulnerable to destabilization by external powers. An ongoing effort to reduce these vulnerabilities comprises some de-dollarization, accumulation of gold reserves to back the rouble, and coordination of efforts with BRICS and SCO countries to create a new financial architecture. As of 2018, Russia has partly replaced external funding through increased share of state funding, helping banks to lend to enterprises, particularly in agriculture but also other sectors. At the same time, raw materials and semi-processed goods continue to drive investment in Russia (World Bank 2018).

Applying the structuration approach to the analysis of Russian modernization, we stressed the interrelationship between the fossil fuel-based choice and diversification, and showed the range of policy options that oscillate between the two. On the one hand, Russia has pursued the narrow diversification strategy based on its existing comparative advantage in the resource sector but moving up the value chain, for example, in terms of efforts in the oil product and LNG markets. This strategy has also more widely focused on energy- and resource-intensive commodities in such industries as basic metals, refined petroleum, and the nuclear industry. On the other hand, broader diversification efforts have concentrated on, firstly, modernizing lagging priority sectors that form the core of global innovation for local markets (aviation, shipbuilding, automotive, and pharmaceuticals) and, secondly, building a knowledge-based economy with an emphasis on global innovative technologies (the ICT, medical, precision, and optical industries). In terms of product diversification, Russia's policies have focused on expanding exports to the EU beyond oil and gas and in terms of geographical diversification, gradually shifting exports away from Europe and toward China and the rest of Asia. Yet the challenges of entering non-traditional markets with a diverse and stable mix of products have underscored the importance of first developing such a mix for domestic and regional markets, with an emphasis on technological convergence and integration within the EAEU.

Overall, our analysis suggests that for all the apparent contradictions of its development model, Russia has pursued a surprisingly broad range of diversification policies. While the early diversification efforts of the mid-2000s that focused on the modernization of lagging priority sectors have had some initial success, other initiatives, particularly those focused on global innovative technologies, were more sporadic and became reinvigorated by the import-substitution policy in 2015. This set of policies seeks to develop new products, promoting exports, replacing sophisticated imports with domestic production, and attracting selected portions of global value chains into the national territory.

Furthermore, the emerging developmental state comes with some Russian characteristics. As a countermove to neoliberalism, drawing upon the new Russian conservatism, it has deep cultural, historical, and ideological roots. It is also a reaction to post-Soviet de-industrialization. Consequently, it is highly critical of the post-industrial ideology with its virtualization of technological progress, and of environmentalism with its calls for zero growth or de-growth. Modernization, linked to geopolitics and conservative values, is crucial for this movement (Bluhm 2016). This view of Russian modernization also prioritizes internal over external integration (Wade 2003). In other words, the idea of the self-sufficient 'national economy' (*l'economie-monde*, in Fernand Braudel's classic terminology) is juxtaposed to the concept of the open and highly specialized economy tightly integrated into the global economic system and unable to exist independently. Historically, both in the Soviet and the pre-Soviet period, Russia leaned toward the idea of the 'national economy' (Remizov et al. 2014).

We suggest that the complexity of challenges, as well as the interplay of the multitude of competing actors and interests within Russia, question the simplified understanding of these developments as top-down 'pseudo modernization' (Zweynert and Boldyrev 2017), new isolationism and securitization of the political economy (Connolly and Hanson 2016) or climate change denialism. For example, Russia's new conservative movement has questioned the deep philosophical underpinnings of technological progress in its post-modernist version. Drawing on Russia's historical experience in implementing large-scale infrastructure and science and technology projects, it proposes to advance the philosophy of 'big style' in technical progress – returning to the modernist paradigm of 'mastering the elements,' in the context of access to new frontiers in space and integrated development of the Arctic, instead of postmodern 'invasion of gadgets' (Remizov et al. 2014: 30).

Although we have documented several choices gradually seeking to move Russia away from neoliberalism and with some reservations, resource dependence also, problems related to agency continue to exist. They include the lack of coherent development priorities and internal contradictions in Russia's economic policy. Despite the government's growing attention to industrial policy, Russia does not have an agreed-upon list of sectoral and technology priorities (Dezhina and Ponomarev 2014, Simachev et al. 2014). In terms of our model, such prioritizations ultimately pertain to the interests that the policy actors wish to serve. The business frame centred on oil and natural gas privileges certain interest groups within the society, has ambiguous effects regarding foreign policy interests, and as we have argued, may not be functional in the long term. The broader economic diversification choices in support of reindustrialisation, especially with import substitution policies, can serve socio-economic and sovereignty interests. They can furthermore create new business frames unifying governmental and industrial actors, improving the economy's resilience vis-à-vis the global political economy and at best, attracting support from the citizenry. East Asian developmental states provide some examples here, although the structural constraints Russia faces highly differ from those that Asia's developmental states once successfully overcame.

2004	The Stabilization Fund introduced
2005	Special economic zones launched

2006	United Aircraft Corporation created
2007	**The Stabilization Fund's resources have been used to finance new development institutions; a shift to more development-oriented economic policy**
2007	**Major state corporations, SOEs, and development institutions created** (Vnesheconombank, Rosnano, Rostekhnologii, Rosatom, and United Shipbuilding Corporation)
2007	S&T Foresight 2025 initiated by the Russian Ministry of Education and Science
2008	**'Concept of Long-Term Socio-Economic Development of Russia up to 2020'**
2011	**S&T Foresight-2030** initiated by the Ministry of Education and Science at the request of the Government of the Russian Federation
2012	The first national programme to support innovative territorial clusters is launched
2013	State programme "Promoting Foreign Economic Activity"
2014	**The federal law 'On Strategic Planning in the Russian Federation'** determined hierarchy and structure of principal documents of national long-term strategic planning, identified the key role of S&T Foresight in this system
2014	**The federal law 'On Industrial Policy in the Russian Federation'**
2014	**National Technological Initiate launched**
2015	The Government Commission on Import Substitution was established
2017	Digital Economy Programme

TABLE 2.3 EVOLUTION OF RUSSIA'S DEVELOPMENT MODEL
Source: CREATED BY LOWRY 2019

[i] Russian customers pay for natural gas approximately 30-50% of the prices in Europe (Rutland 2015, 7).
[ii] The planned completion of the Nord Stream-2 pipeline by the end of 2019 will enable Gazprom to ship 110 billion cubic metres of natural gas per year directly to Germany by passing transit states. However, it is conceivable this capacity will not be enough to cover the full volume of Russian-European gas trade.
[iii] In 2017, Gazprom pledged to remove all clauses from its contracts with EU area customers prohibiting re-sales of gas and to introduce regular price reviews and gas pricing linked to Western European benchmark prices to remove excessively high gas prices in the CEE (Commission 2017).
[iv] The legal basis for strategic planning was set first with the issue in 2009 of the classified order 'On the Foundations of Strategic Planning,' and later the 'Law on Strategic Planning,' which passed through the Russian parliament in June 2014. A related significant development was the adoption of the federal law "On Industrial Policy in the Russian Federation" on December 31, 2014 (488-FZ 2014).
[v] The objectives vary depending on the type of a special economic zone and range from the development of innovative business and manufacture of high-technology products to tourism and the expansion of transport and logistics systems.
[vi] On August 3, 2010, the Government Commission on High Technologies and Innovations approved 'The Procedure for the Formation of the List of Technological Platforms' (Dezhina 2013). In 2012, the Ministry of Economic Development launched the first national programme to support clusters (Artamonova and Khrustalyev 2013). This programme entailed the selection of 25 pilot innovative territorial clusters, 14 of which would receive federal subsidies.
[7] As a characteristic example, the Strategy 2020 lacks a chapter dedicated to the vision and objectives of the national industry (Gurova and Ivanter 2012).
[8] Russia's investment-to-GDP ratio is 20% and is among the lowest of the major middle-income countries (Connolly, 2015, 9).
[9] One such reason has to do with the psychological trauma of the financial crisis of 1998 when an uncontrolled growth in public debt and the pyramid of state bonds ended in financial collapse. This psychological trauma restrains the authorities from rash decisions, compelling them to beware of financial risks. However it also hampers development as it makes the authorities excessively timid and leads them to reject new solutions.
[10] During the period of 2002-2012, Russian ship owners ordered and built 90% of new vessels at foreign shipyards (*Gosudarstvennaya Programma* 2012b).
[11] At least three internationally-recognized Russian companies – Rosatom, Gazprom, and Aeroflot – are an exception to this rule, having demonstrated intensive use of corporate foresight tools in developing their innovation strategies.
[12] Total natural resources rents are the sum of oil, natural gas, coal, mineral, and forest rents. They are calculated as the difference between the price of a commodity and the average cost of producing it. To do this, estimates of average unit costs of extraction or harvesting costs are subtracted from estimates of the world price of units of specific commodities. To determine the rents for each commodity as a share of GDP, these unit rents are then multiplied by the physical quantities that countries extract or harvest (Lange et al. 2018).