



Russia's Medium-Term Economic Prospects

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Preface

This report takes stock of the medium-term outlook for the Russian economy. It finds that the costs of renationalization, corruption, regulations and laws that impair the operations of businesses, and Western sanctions have combined to reduce economic output and slow recovery in Russia. Policy changes to address these issues could accelerate economic growth by as much as 4.4 percentage points per year. By assessing the likely course of Russia's economy through 2025, this report should inform policymakers and business leaders in the United States, Europe, and Russia of the likely economic and fiscal implications of Russia's current economic and foreign policies.

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Summary

Purpose

This report takes stock of the medium-term outlook for the Russian economy. By assessing the likely course of Russia's economy through 2025, we seek to inform policymakers and business leaders in the United States, Europe, and Russia of the likely economic implications of Russia's current economic and foreign policies.

Assessing Changes in Russia's Economy Since 1999

Russia enjoyed a decade of rapid economic growth and rising incomes between 1999 and 2008, one of the fastest periods of economic growth in Russia's history. One of the hallmarks of Russia's recovery has been the boom in earnings from oil and gas exports. Earnings from petroleum, gas, and refined oil product exports rose from a low of \$28 billion in 1998, the year when the ruble crashed, to \$310 billion in 2008. The oil and gas industries are estimated to have generated from 17 to 25 percent of Russia's gross domestic product (GDP) between 2000 and 2011. We estimate that increases in exports of oil and gas, as measured in constant price dollars, may have accounted, directly or indirectly, for 46 percent of the increase in Russian GDP between 1999 and 2008. Despite the importance of exports of oil and gas for growth, the most dynamic sectors of the Russian economy in terms of output between 1999 and 2008 were construction, retail and wholesale trade, and transport and telecommunications, not oil and gas. Market disciplines and the introduction and expansion of the private sector massively improved the efficiency with which capital and other resources were used.

In 2009, like the United States and Europe, Russia fell into severe recession; output fell 7.9 percent. Although the economy rebounded in 2010 and 2011, growth slowed to an average annual rate of just 1.7 percent per year between 2012 and 2014, far below the average annual rate of 6.9 percent during the 1999–2008 boom. Many of the factors that had driven growth since 1999 had dissipated by 2012. Unemployed labor had been pulled into the economy; the unemployment rate fell from 13.0 percent in 1999 to 5.5 in 2014. Between 1999 and 2008, Russia benefited from drawing upon underutilized capital and from targeted additional investments in existing production facilities that greatly improved their productivity and the quality of the final product. These measures provided a substantial impetus to growth. By 2008, these factors were substantially played out. Since 2008, investment has failed to drive economic growth. Russian investment in gross fixed capital fell sharply in 2009 and did not regain its 2008 level until 2012, before falling again in 2014. Currently, structural barriers (e.g., rena-

tionalization, foreign policies that impinge on economic performance) are severely impeding the increases in productivity needed to drive growth.

Factors Contributing to Russia's Current Recession

We analyzed six factors that have contributed to Russia's current recession:

1. deterioration in Russia's terms of trade and the associated depreciation in the real effective exchange rate (REER)
2. increased state control in the economy
3. corruption
4. the inhospitable business environment
5. increased cost of capital due to sanctions and other factors
6. declining labor force.

We estimate that the declines in the export prices of crude oil, refined oil products, natural gas, and other commodity exports have led to a 30-percent decline in Russia's terms of trade. We further estimate that this decline will lead to a 3.6-percent fall in consumption, a 5.2-percent reduction in government consumption, and an 8.7-percent decline in long-run fixed investment. Drawing on studies that estimate the effects of changes in the price of oil on Russian output, we estimate that a 50-percent decline in the price of oil would lead to an 11-percent fall in GDP. However, sharp declines in terms of trade are frequently followed by depreciation in the REER, the currency-weighted estimate of shifts in exchange rates incorporating the effects of inflation and changes in the nominal exchange rate. The Russian ruble has fallen sharply since mid-2014 and, along with it, the REER was down 28 percent as of mid-2015. We estimate that a decline in the REER of the ruble would be associated with a 6.7-percent increase in long-run GDP, thus offsetting the 11-percent decline in GDP to a large extent.

Across the world, state-owned enterprises have been shown to operate less efficiently, are less innovative, and generate lower rates of return on invested capital than privately owned firms. After rapid privatization during the 1990s, successive Putin administrations have engaged in renationalization (e.g., the absorption of Yukos energy assets by Rosneft). The Kremlin has pressured investors and entrepreneurs (e.g., Vladimir Yevtushenkov) to transfer assets to state-controlled enterprises at fire-sale prices, usually to companies whose owners are closely affiliated with political power structures. In an effort to assess the potential costs of these policies, we compared rates of increase in total factor productivity between 2000 and 2008 with those between 2010 and 2013. Following the large-scale renationalizations of recent years, growth in total factor productivity fell from 5.5 percent per year in the first period to just 1.1 percent in the last.

Russia's economy has been marred by large-scale corruption since the Tsarist era. Russia ranks poorly on all major indices of corruption, both in absolute terms and relative to other countries. Throughout the 2000s, corruption in Russia has been greater than in China, as measured by Transparency International;¹ in 2014, it was on par with Nigeria. This corruption has costs. Russia's statistical agency has generated the lowest estimate of the cost of corruption

¹ Transparency International, "Corruption Perceptions Index," website, 2015.

to the Russian economy: 3.5 percent of GDP in 2011.² A group of independent Russian experts estimates that corruption runs roughly 25 percent of GDP.³

In contrast to measures of corruption, following a presidential executive order by Putin decreeing that the Russian federal government would greatly reduce the number of permits and other regulatory interventions that make it difficult for businesses to operate in Russia, Russia's place in the World Bank's "Ease of Doing Business" ranking has risen. Russia moved up 69 spots from 120th in 2012 to 51st place in 2016.⁴

Between the third quarter of 2013 and the first quarter of 2015, the Russian government suffered a 4.4-percentage-point increase in spreads between sovereign Russian euro bonds and German *bunds* as the cost of the government's capital rose 75 percent, from 5.8 to 10.2 percent. This increase was driven by a combination of international financial sanctions; concerns about corporate credit risk stemming from the fall in export commodity prices; and risks associated with Russian assets because of changes in Russian government policies, especially foreign policy under Russian president Vladimir Putin. The Russian government's creditworthiness has fallen because of declines in dollar-denominated tax revenues and capital flight stemming from increased investor worries. Higher interest rates and declining domestic and foreign investor interest in Russia have led to a sharp fall in investment.

The cohorts of working-age Russians (20 to 65 years old) are falling and are projected to continue to fall sharply over the coming decades. Between 2012 and 2025, the number of working-age Russians is projected to fall 12 percent. Using an estimate of the contribution of labor to GDP, this 12-percent fall would translate into a level of GDP 7 percent lower than it would be if the labor force were to remain stable.

Implications for Russia's Economic Growth Through 2025

The Russian economy fell into recession in 2015. According to the European Bank for Reconstruction and Development, Russia's GDP, after likely having fallen 4.2 percent in 2015, is likely to suffer a further decline of 1.2 percent for 2016.⁵ Both the International Monetary Fund (IMF) and the Russian Ministry of Economy also take a sober view of Russia's medium-term growth prospects. After the recession in 2015, the IMF projects a modest recovery in 2016, followed by trend line growth of 1.5 percent per annum over the next several years, far

² The Russian Federation, Federal State Statistics Service's estimates included unreported salaries (as a means of avoiding taxes and other social payments), as well as other types of tax evasion. See Alexandra Kalinina, "Corruption in Russia as a Business," Institute of Modern Russia website, January 29, 2013.

³ V. Milov, B. Nemtsov, V. Ryzhkov, and O. Shorina, eds., "Putin. Corruption," an independent white paper, trans. Dave Essel, Moscow: Partiya Narodnoi Svobody, 2011

⁴ World Bank, *Doing Business 2012: Doing Business in a More Transparent World*, Washington, D.C., 2012; World Bank, *Doing Business 2013: Smarter Regulations for Small and Medium-Size Enterprises*, Washington, D.C., 2013a; World Bank, *Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises*, Washington, D.C., 2013b; World Bank, *Doing Business 2015: Going Beyond Efficiency*, Washington, D.C., 2014; World Bank, *Doing Business 2016: Measuring Regulatory Quality and Efficiency*, Washington, D.C., 2016a.

⁵ European Bank for Reconstruction and Development, "Regional Economic Prospects in EBRD Countries of Operations," London, November 2015.

below the 6.9 percent average annual growth rates of the boom years.⁶ The Russian Ministry of Economy takes a slightly more bullish view. It projects trend line growth of about 2.2 percent after the end of the current recession. However, this growth rate is predicated on a price for Ural oil of \$60 per barrel.⁷ Even so, this is far below the average annual rates of the last decade.

What would need to happen for Russia to grow faster? Table S.1 shows potential increases in GDP or the rate of growth in GDP for favorable changes for six of the factors we evaluated earlier: (1) higher world market prices for oil and natural gas, leading to an improvement in Russia's terms of trade coupled with a rebound in the REER; (2) an acceleration in the rate of growth due to the end of Putin's renationalization policy and to a renewed, aggressive effort to privatize Russia's state-owned and state-controlled enterprises; (3) an increase in output due to decreased corruption; (4) an increase in rates of economic growth due to higher investment stemming from the end of sanctions; (5) an acceleration in the rate of economic growth due to an improvement in the business climate; and (6) moderation in the decline in the labor force through higher-than-expected net immigration. Because we analyzed the effects of improvements in these factors on GDP or the growth rate separately for each factor, the improvements are not additive: There is a degree of double counting in the separate estimates of the growth rates. Consequently, even though growth rates will be higher than the individual estimates of the effects of the various factors on growth if everything breaks right for Russia, summing all the additions to growth would exaggerate potential growth rates.

Table S.1
Potential Increments to Russia Growth Rates

Factor	Increase in GDP or Growth Rate ^a
Improvement in terms of trade due to higher oil prices coupled with appreciation of the real effective exchange rate	4.5 ^b
Privatization	4.4
Reduction in corruption	0.3
End of sanctions	1.4
Improvement in the business environment	2.2
Increased immigration	0.1

SOURCE: RAND estimates.

^a In percentage points.

^b This effect is a one-off increase in GDP. The other figures are estimates of potential increases in the annual rate of growth in GDP.

⁶ IMF, "Russian Federation: Staff Report for the 2015 Article IV Consultation," Washington, D.C., Country Report 15/211, August 2015, p. 7.

⁷ Darya Korsunskaya, "The Ministry of Economy of the Russian Federation Worsened Its Three-Year Macroeconomic Forecast [Минэкономики РФ ухудшило трехлетний макропрогноз]," Reuters/Russia and CIS Countries, August 25, 2015.

Improvements in Russia's Terms of Trade Due to Rebound in Oil Prices

If oil prices were to go back up, if Russia's terms of trade returned to those in 2013, and if the REER appreciated back to previous levels, we estimate that Russia's GDP would enjoy a one-off increase of 4.5 percent.

Privatization

Russia would enjoy a very substantial increase in productivity from a renewed effort to privatize assets, particularly in the oil and gas industry, where productivity gaps between state-controlled and privately owned companies have been especially large. We have attempted to provide a rough estimate of the potential increase in the rate of growth in total factor productivity stemming from an aggressive program to privatize state-owned assets and from improvements in other factors by calculating the difference between total factor productivity growth between 2000 and 2008 (5.5 percent per year), when the private sector accounted for a larger share of assets and output, and 2010 and 2013 (1.1 percent per year), when oil prices were still high, but the state played a much larger role in the economy. We found that the difference in total factor productivity growth, hence in GDP growth, was 4.4 percentage points. Although the difference in productivity is due to a variety of factors, an aggressive privatization program and a retreat of the state sector from the Russian economy could lead to a substantial acceleration in economic growth, recovering at least part of the decline in the rate of growth in total factor productivity. However, there is currently no sign that the Russian government plans to privatize the large state-owned enterprises that have been renationalized.

Greatly Reduced Corruption

We drew on parameter estimates of the relationship between an index of corruption and levels of investment and the rate of growth in GDP by Paolo Mauro to estimate the potential increase in the rate of economic growth for Russia,⁸ if the Russian government could reduce corruption to the extent that Romania reduced corruption between 2000 and 2006. We calculated that reducing corruption as much as Romania reduced corruption could increase the annual rate of growth in Russian GDP by 0.3 percentage point.

End of Sanctions

To estimate the potential effects of an end to sanctions on Russia, we assumed that the Russian government would fully implement the Minsk accords regarding eastern Ukraine, thus ending the main sectoral sanctions. We also assumed that Russia would pursue more-open economic policies and improve its business climate, making it more attractive to foreign investors. As a consequence of this policy change and the end of sanctions, interest rate spreads would fall back to their 2007 levels. In addition, we assumed that the share of gross fixed capital investment would rise from 19 to 26 percent of GDP—the reverse of South Africa's experience, where the onset of much tougher sanctions in the second half of the 1980s resulted in a decline in the share of GDP devoted to gross fixed capital investment from 26 to 19 percent. We found that such an increase in the share of investment could add 1.4 percentage points to Russian growth under these assumptions.

⁸ Paolo Mauro, "Corruption and Growth," *Quarterly Journal of Economics*, Vol. 110, No. 3, August 1995.

Improvement in the Business Climate

Russia's business environment has substantial room for improvement. The IMF argues that improvements in the regulatory environment for financial services alone could raise the GDP growth rate by 1 percentage point.⁹ To calculate our own estimate of the potential increment to growth made possible by improving the business environment, we used the same model as for calculating the potential growth increment from eliminating sanctions. However, in this instance, we assumed that Russia would become so much more attractive to investors that it would no longer be a net exporter of capital, an optimistic assumption. Because capital exports have averaged 10.4 percentage points of GDP between 2000 and 2014, the share of gross fixed capital investment in GDP would rise to 29.4 percent, adding an additional 2.2 percentage points to GDP growth.

More-Welcoming Immigration Policies

One way to mitigate the effects of the declining numbers of working-age Russian nationals would be for Russia to encourage immigration, especially from Russian-speaking populations to the south. If net inflows of immigrants were to stay at their levels of 2013 and 2014, rather than decline as United Nations forecasts of Russia's population assume, the decline in Russia's working-age population between 2012 and 2025 would be 9 percent, rather than 12 percent. Using this larger working-age population, we project that an increase in migration would raise annual growth by about 0.1 percentage point between 2015 and 2025.

Policy Implications

Without major policy changes, the Russian economy will grow slowly in the medium term, even if world market prices for oil rebound sharply by the end of the decade. However, returning to policies that Russia has pursued in the recent past would lead to substantially higher rates of growth.

Cross walking the analysis above with specific policy changes, we found that a combination of an aggressive program to privatize state-owned assets, clamping down on corruption, and improving the business environment should accelerate growth in total factor productivity, potentially leading to a jump in GDP growth rates of up to 4.4 percentage points per year. If Russia were to fully implement the Minsk accords regarding eastern Ukraine, all sanctions except for those associated with its annexation of Crimea would likely be eliminated, potentially boosting GDP growth by at least 1.4 percentage points per year.

We believe it unlikely that the Russian government will make all or, in fact, any of these policy changes. However, we believe it is useful to tote up the opportunity costs for Russia of its government's current course of action.

⁹ IMF, 2015, p. 19.

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Introduction

The Russian economy is in recession, a consequence of the fall in the price of oil on world markets in 2014, increased business risk and costs associated with President Vladimir Putin's foreign and economic policies, and Western economic sanctions. In volatile times, it is perhaps natural for analysts to focus on the near-term economic and political consequences of fast-moving developments. More important, though, may be Russia's medium-term prospects in a world that may well see low oil prices for several years, where access by Russian businesses to Western financing and energy sector technologies is impeded, and where Russia's technical and entrepreneurial talent seeks opportunities abroad. Will these conditions force the Russian government to liberalize the economy? Or will they simply intensify rent-seeking behavior and corruption? This report explores these questions.

Russia enjoyed a decade of rapid economic growth and rising incomes between 1999 and 2008, one of the most rapid periods of economic growth in its history. Like the developed world, Russia underwent a severe recession in 2009. In contrast, the other members of the group of large developing countries—Brazil, Russia, India, China, and South Africa (BRICS)—escaped recession. Since then, Russia's subsequent recovery has remained halting, and in 2015, it fell back into recession, for a number of reasons that we explore in this report:

- **Deterioration in Russia's terms of trade and depreciation of the real effective exchange rate**—Declines in the export prices of crude oil, refined oil products, natural gas, and other commodity exports have led to a sharp deterioration in Russia's terms of trade. The decline in the terms of trade was accompanied by a depreciation of the real effective exchange rate (REER), the currency-weighted estimate of shifts in exchange rates incorporating the effects of inflation as well as changes in the nominal exchange rate.
- **Increased state control of the Russian economy**—The Putin administration has pressured foreign investors and private entrepreneurs to sell assets to state-controlled enterprises, usually run by Putin associates, or to companies whose owners are closely affiliated with the regime. Anders Åslund has noted a slowdown in growth in the productivity of capital due to the narrowing space for independent entrepreneurs and foreign companies to operate in Russia because of this policy.¹
- **Corruption**—Russia has been plagued by corruption since the Tsarist era. Between 1995 and 1999, the most notable sources of corruption were associated with the sale of state-

¹ Anders Åslund, "Russia's Output Will Slump Sharply in 2015," *American Interest*, January 15, 2015.

owned assets to favored individuals at less-than-market prices.² Although the situation has improved since then, Russia continues to rank poorly on all major indices of corruption.

- **The poor business environment**—Since 2012, Russia has made significant progress in easing procedures for registering property and starting a business and in improving contract enforcement. However, along other dimensions, the business climate in Russia is less hospitable than in most developed countries.
- **Sanctions and the increased cost of capital**—The Russian government and Russian businesses and consumers have experienced a sharp increase in the cost of capital since mid-2014. This increase has been driven by a combination of international financial sanctions; concerns about corporate credit risk stemming from the fall in export prices; risks associated with Russian assets because of changes in Russian government policies, especially foreign policy under Putin; and questions about the Russian government's creditworthiness because of declines in dollar-denominated tax revenues and capital flight stemming from increased investor worries. Declines in the creditworthiness of Russian firms and consumers because of the fall in the REER have also contributed to the perception of increased risk and therefore higher interest rates.
- **Declining labor force**—Russia's birth rate dropped below replacement rate prior to the dissolution of the Soviet Union and fell even more sharply during the transition, as it did in other transition economies. The cohorts from the "birth bust" of the early 1990s have been entering the labor force since 2010 and are too small to replace those retiring or otherwise exiting the labor force. At the same time, male life expectancy is low because of premature deaths stemming from alcohol, smoking, and accidents, and retirement ages are lower in Russia than in other countries with similar employment patterns and levels of education. As a consequence of these various factors, Russia's labor force is entering a decade of sharp declines.

The remainder of this report is organized as follows. In Chapter Two, we tease out the primary drivers of economic growth during the period from 1999 to 2008, so that we can assess whether these drivers are likely to persist in the coming years. We also examine what factors precipitated the 2009 recession. Chapter Three addresses the drivers of the current decline in output in Russia, looking specifically at the six factors discussed earlier.

Chapter Four begins with a discussion of business-as-usual projections of economic growth for Russia. Without an increase in oil prices, changes in Russia's policy would be necessary to alter these relatively low growth projections. The chapter concludes by spelling out policy changes that would be needed to trigger favorable changes in economic growth and investigates the potential effects on economic growth that could be triggered by (1) improvements in Russia's terms of trade, (2) a reduction in the state's role in the Russian economy through privatization, (3) a reduction in corruption, (4) improvements in the business environment, (5) declines in real interest rates because of a shift in Putin's foreign and security policies and the removal of international sanctions, and (6) more-favorable attitudes toward immigration.

² Timothy Frye and Andrei Shleifer, "The Invisible Hand and the Grabbing Hand," *American Economic Review*, Vol. 87, No. 2, 1997; Steven Solnick, *Stealing the State: Control and Collapse in Soviet Institutions*, Cambridge, Mass: Harvard University Press, 1998; Vadim Volkov, *Violent Entrepreneurs: The Use of Force in the Making of Russian Capitalism*, Ithaca, N.Y.: Cornell University Press, 2002; David Hoffman, *The Oligarchs: Wealth and Power in the New Russia*, New York: Public Affairs, 2003; Karen Dawisha, *Putin's Kleptocracy: Who Owns Russia?* New York: Simon and Schuster, 2014.

Drivers of Russia's Economic Growth

To understand how the Russian economy may evolve over the next decade, we first turn to the past to assess what drove economic growth during the boom years of 1999 to 2008; what precipitated the 2009 recession, even though Brazil, India, China, and South Africa, the other members of the BRICS, continued to enjoy economic growth; and what led to the slow recovery from the 2009 recession before Russia's current downturn, which began in 2014.

The Boom: 1999–2008

Gross Domestic Product and Per Capita Gross Domestic Product

After the crash of the ruble in 1998, Russia enjoyed its best decade of economic growth ever. Growth in gross domestic product (GDP) averaged 6.9 percent per year between 1998 and 2008. This rate of growth was probably higher than during the boom between 1890 and 1900 in prerevolutionary Russia that stemmed from the economic reforms Finance Minister Sergei Witte had introduced.¹ It was also higher than rates of growth during Josef Stalin's drive to industrialize Russia in the 1930s. Although the Soviet statistical yearbook reports that net material product, a Marxist construct somewhat similar to GDP that excludes services, rose at an average annual rate of 12.2 percent per year between 1928 and 1940,² this figure has been found to be exaggerated. Gur Ofer estimated that growth in GDP was 5.8 percent per year in the 1930s.³

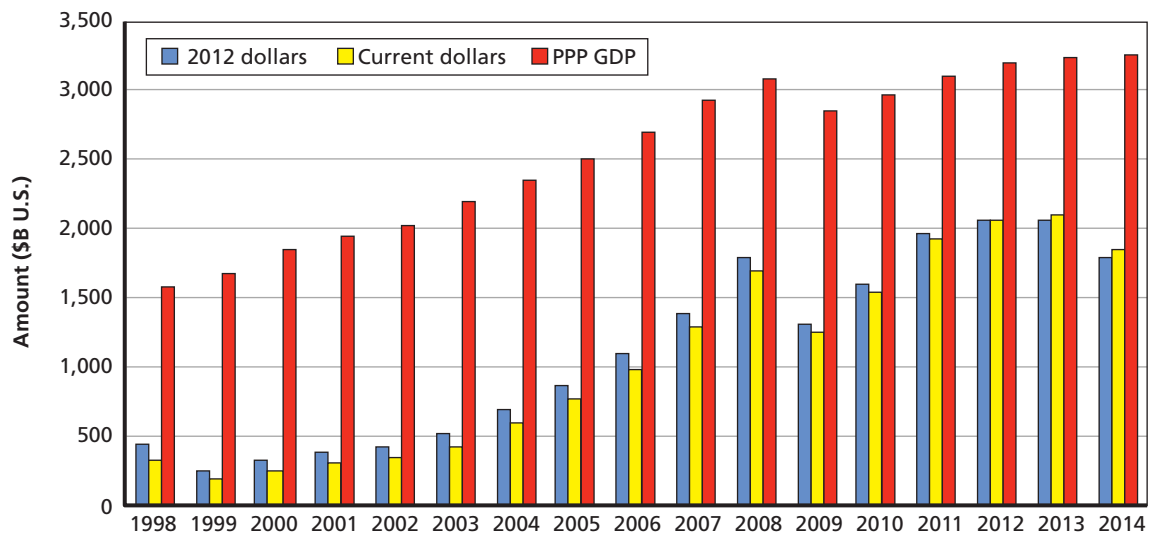
Even more striking has been the rapid rate of growth in dollar GDP (Figure 2.1). Due to this solid economic growth and the appreciation of the Russian ruble in real effective terms, a measure of exchange rate appreciation that nets out differences in inflation between the ruble and the major currencies in which Russia trades, nominal dollar GDP increased at an average annual rate of 24 percent between 1999 and 2008 following the ruble's collapse in 1998. Converted into constant price 2012 dollars using the U.S. GDP deflator, the annual rate of increase was 21 percent, more than double the rate at which Chinese dollar GDP grew over the same period. After this surge in growth, Russia's GDP ran \$1.7 trillion in 2008, compared to \$196 billion in 1999, putting Russia back into the ranks of the largest ten economies in the world.

¹ W. E. Mosse, *Economic History of Russia, 1856–1914*, London, UK: I. B. Taurus, 1996.

² USSR State Committee of Statistics (Goskomstat), *National Economy of the USSR for 70 Years [Narodnoe Khoziaistvo SSSR za 70 Let]*, Gosydarstvennii Komitet SSSR, 1987.

³ Gur Ofer, *Soviet Economic Growth 1928–1985*, Santa Monica, Calif.: RAND Corporation, JRS-04, 1988.

Figure 2.1
GDP at Market Exchange Rates and 2010 Purchasing Power Parity Exchange Rates



SOURCES: Authors' calculations based on data from Russian Federation, Federal State Statistics Service (Rosstat), "Production and Use of Gross Domestic Product," Russia in Figures website, 2016b; average annual exchange rates from International Monetary Fund (IMF), "IMF Data," International Financial Statistics (IFS) database website, undated; purchasing power parity (PPP) data from World Bank, "An Overview of the International Comparison Project," undated a; World Bank, "World Development Indicators," Web page, 2016b; and the GDP deflator from U.S. Bureau of Economic Analysis, "National Income and Product Accounts," various years.

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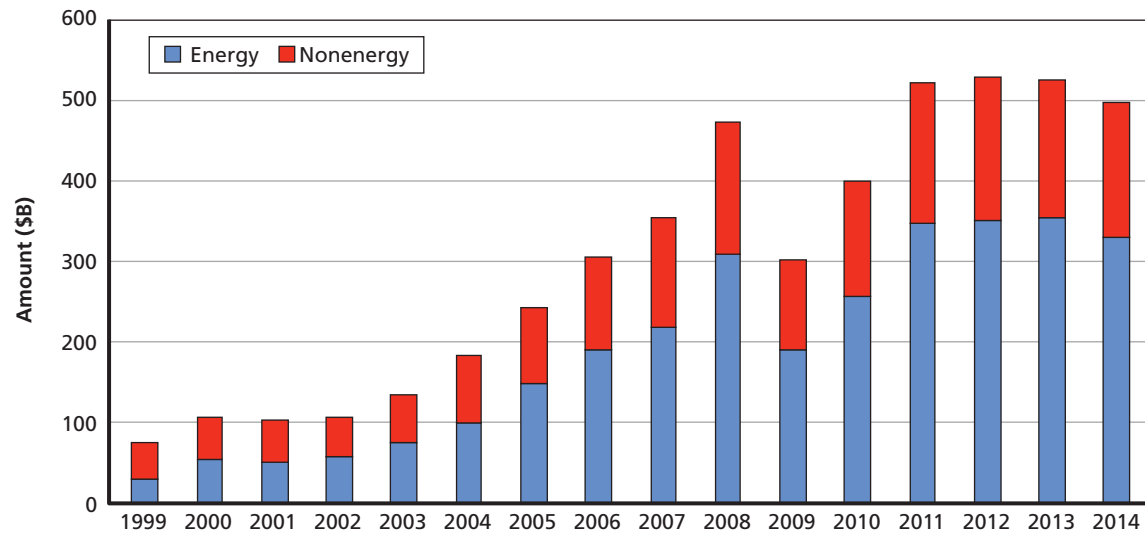
Because Russia's population has fallen, per capita income has been growing more rapidly than GDP, rising from \$1,750 2012 dollars in 1999 to \$12,454 2012 dollars in 2008. Not all the economic benefits have accrued to the wealthy: Average monthly wages for employees in all sectors rose sharply from \$62 in 1999 to \$696 in 2008. The extraordinary increase in dollar wages over this period goes far to explaining Putin's high approval ratings. The low wages during the 1990s, and public anger about corruption in privatization and other policy measures that led to the rise of ultrarich oligarchs, explain Russians' distaste for the economically chaotic period of the 1990s.

The Role of Oil and Natural Gas in the Russian Economy

One of the hallmarks of Russia's recovery has been the boom in earnings from oil and gas exports. Earnings from petroleum, gas, and refined oil product exports rose from a low of \$28 billion in 1998, the year when the ruble crashed, to \$310 billion in 2008 (Figure 2.2). Despite substantial increases in exports of other commodities, the share of energy exports, by value, in total exports also rose, from 41 percent in 1999 to 66 percent in 2008. The increase was primarily driven by a sixfold increase in export prices for Russian oil and gas and, to a lesser extent, by a 66-percent increase in volumes of oil exports. Increased exports of natural gas were much more sedate: The value of exports to Western markets rose by one-fifth between 1999 and 2008; by volume, total exports of natural gas were flat. With the exception of exports of liquefied natural gas, these exports went to Europe and Russia's near neighbors, the only countries connected to Russia by natural gas pipelines.

Oil and, to a much smaller extent, natural gas have played major roles in generating tax revenues. The Russian government derives revenues from the oil and natural gas industries

Figure 2.2
Russian Energy and Nonenergy Exports, 1999–2014



SOURCE: Central Bank of Russia (CBR), "Balance of Payments of Russia: Analytical Presentation," various years.

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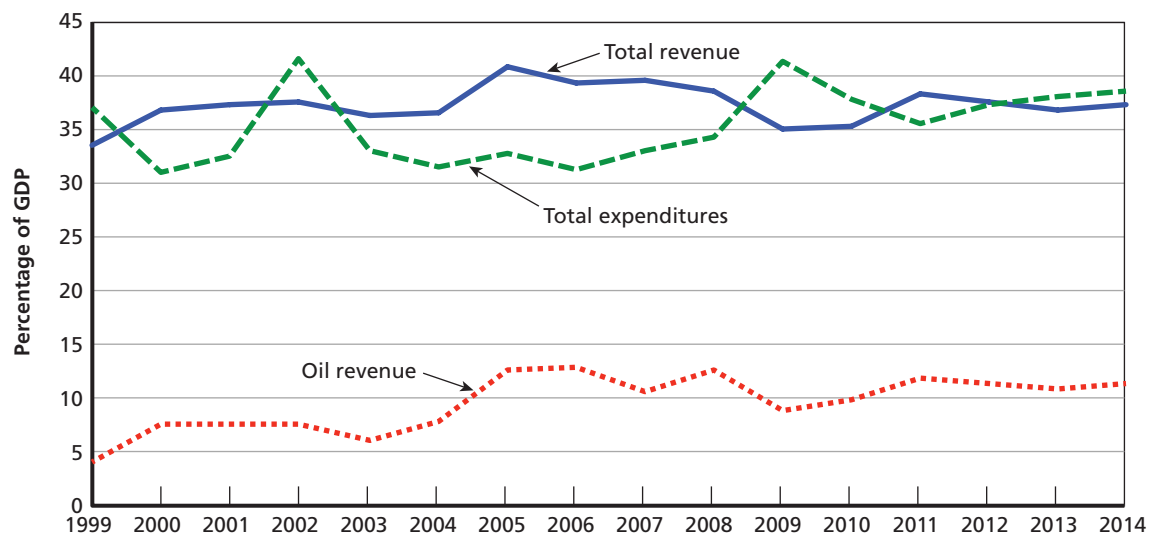
from royalty payments, taxes on exports, domestic excise taxes on gasoline and diesel, profit taxes on energy companies, and a variety of other levies. Most of this is from oil: A combination of low domestic prices for natural gas and increased costs of extraction and transportation, especially the costs of such new pipelines as Nordstream, have limited the ability of the Russian government to generate substantial revenues from natural gas.

Figure 2.3 shows total government revenues, total revenues from oil, and total government expenditures as a share of GDP from 1999 to 2014. As can be seen, total government revenues from oil rose sharply from 3.9 percent of GDP in 1999 to close to 13 percent of GDP in 2005, 2006, and 2008. Oil revenues, as a share of total government revenues, rose from 12 percent in 1999 to roughly 30 percent in recent years. Oil revenues are primarily collected at the federal level and have run close to one-half of total federal revenues since 2006. Regional and local governments rely on value-added and other taxes. Between 2004 and 2008, the bulk of oil and gas revenues was parked in a stabilization fund to be saved for a time when revenues from oil and gas declined. Because such a large share of oil revenues was saved, they covered only one-quarter of federal government expenditures in some years and about one-seventh of consolidated expenditures. However, since 2008, the Russian government has drawn on these funds to cover much higher shares of government expenditures.

Oil and gas contribute less to GDP than they do to exports or budget revenues. According to official Russian figures based on input-output tables, oil and gas production has accounted for less than 10 percent of Russia's GDP.⁴ However, these figures do not include value added from the refining sector or from transportation of oil and gas by pipeline or railroad. Refining, pipelines, and railroads contribute much more to GDP than in similar countries because of

⁴ Heli Simola, "Assessing the Contribution of Russia's Oil and Gas Sector to GDP," in Heli Simola, Laura Solankom, and Vesa Korhonen, eds., *Perspectives on Russia's Energy Sector*, Helsinki: Bank of Finland, Institute for Economics in Transition, 2013, p. 4.

Figure 2.3
Russian General Government Revenues, Oil Revenues, and Expenditures, 1999–2014



SOURCES: Revenues and expenditures as a share of GDP from IMF, Russian Federation Country Reports, various years; resource rents from World Bank, "Total Natural Resources Rents (% of GDP)," Web page, undated b.

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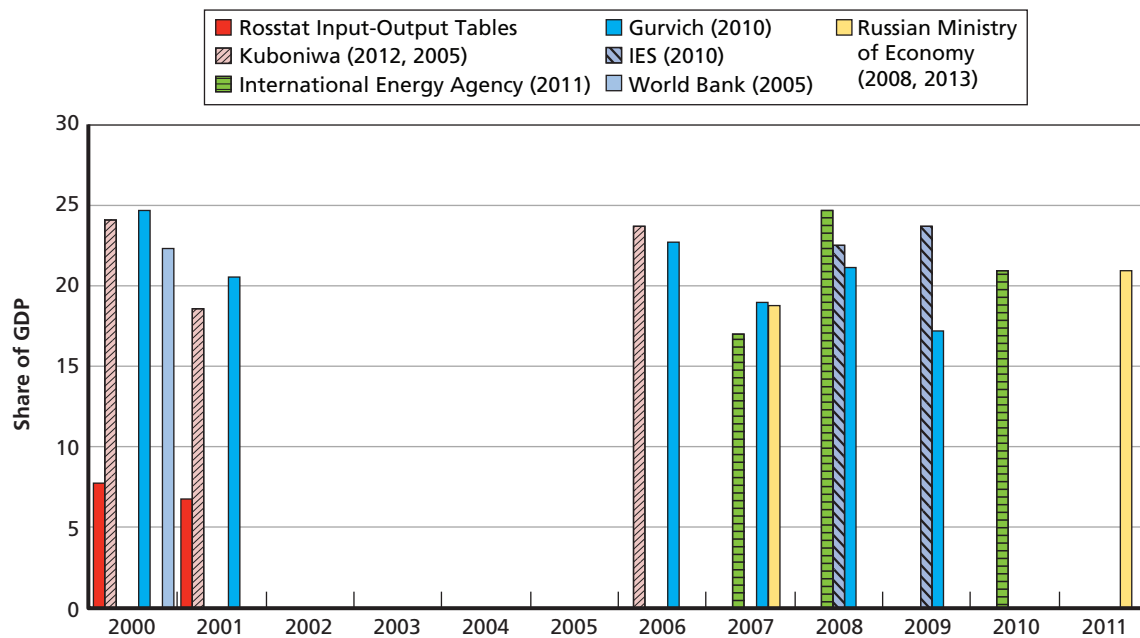
transfer pricing that shifts value added from production to these sectors. The World Bank and other research organizations and independent scholars have recalculated Russian GDP, shifting the value added associated with transfer pricing back to the oil and gas production sector. Figure 2.4 shows a variety of such estimates. These estimates ranged from 17 to 25 percent of GDP and cover the period from 2000 to 2011. Compare these estimates with the 7.8 percent of GDP derived from official Russian input-output tables for 2000.⁵ We did not see any trends in the disparate alternative estimates over time. In addition to these estimates, the World Bank has created a methodology for estimating resource rents, that is, value added above and beyond costs of labor and capital inputs from natural resources, as a share of GDP for the countries of the world.⁶ In the case of Russia, these rents would include minerals and forestry products in addition to natural gas and oil but would be predominantly oil and gas. The World Bank's estimates for Russia show considerable variability from year to year and over the course of 1999 to 2014. For example, the estimate for 1999 is 24 percent of GDP. This number jumped to 43 percent of GDP in 2000 but then fell to 18.2 percent in 2013. In general, the numbers seemed high to us because, in many years, they substantially exceed the estimates of GDP generated by oil and gas shown in Figure 2.4, often by 10 percentage points or more. Because most resource rents in Russia stem from oil and natural gas, we had expected the two measures to be more similar.

There is widespread agreement that the large increases in the dollar value of exports of energy, especially oil, have played a major role in driving economic growth during the boom. Increases in quantities exported and in world market oil prices both played important roles

⁵ World Bank, *Russian Economic Report*, Washington, D.C., February 2004, p. 15.

⁶ World Bank, *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium*, Washington, D.C., 2011.

Figure 2.4
Estimates of the Contribution of the Production of Oil and Gas to Russia's GDP



SOURCES: Simola, 2013, p. 4; Masaaki Kuboniwa, Shinichiro Tabaka, and Natalya Ustinova, "How Large Is the Oil and Gas Sector in Russia?" *Eurasian Geography and Economics*, Vol. 46, No. 1, 2005, pp. 16, 26; Masaaki Kuboniwa, "Diagnosing the 'Russian Disease': Growth and Structure of the Russian Economy," *Comparative Economic Studies*, Vol. 54, 2012; Rosstat, Input-Output Tables, Moscow, undated; Russian Ministry of Economy, *The Concept of Long-Term Socio-Economic Development of the Russian Federation for the Period up to 2020*, Moscow, November 17, 2008; Russian Ministry of Economy, *Long-Term Socio-Economic Development Forecast for the Russian Federation for the Period up to 2030*, Moscow, March 2013.

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in the rise in constant dollar exports. Although increased prices did provide an incentive to increase production and exports during this period, supply side factors, such as improved management of Russian oil operations and greater use of oil service companies, also contributed to increased oil output.

To generate a quantitative estimate of the contribution of energy exports to GDP growth, we regressed GDP on the dollar value of exports of crude oil, refined oil products, and natural gas converted to 2012 dollars using the U.S. GDP deflator and data for every quarter from 2000 to 2014, and controlling for seasonal (quarterly) variation and a linear trend. We then predicted fitted values of GDP based on the regression coefficient.

To construct the counterfactual—what GDP would have been in the absence of the increase in the constant dollar value of energy exports—we set the constant dollar value of energy exports equal to their level in 1999, and used the fitted model to estimate GDP. This counterfactual assumes that both the prices and the quantities of energy exports remain at their 1999 levels. Alternatively, we could have held prices fixed but allowed quantities to increase in line with historical observation. However, since the increase in export quantity was almost certainly driven at least in part by the increase in price, we considered a counterfactual that held both prices and export quantities constant.

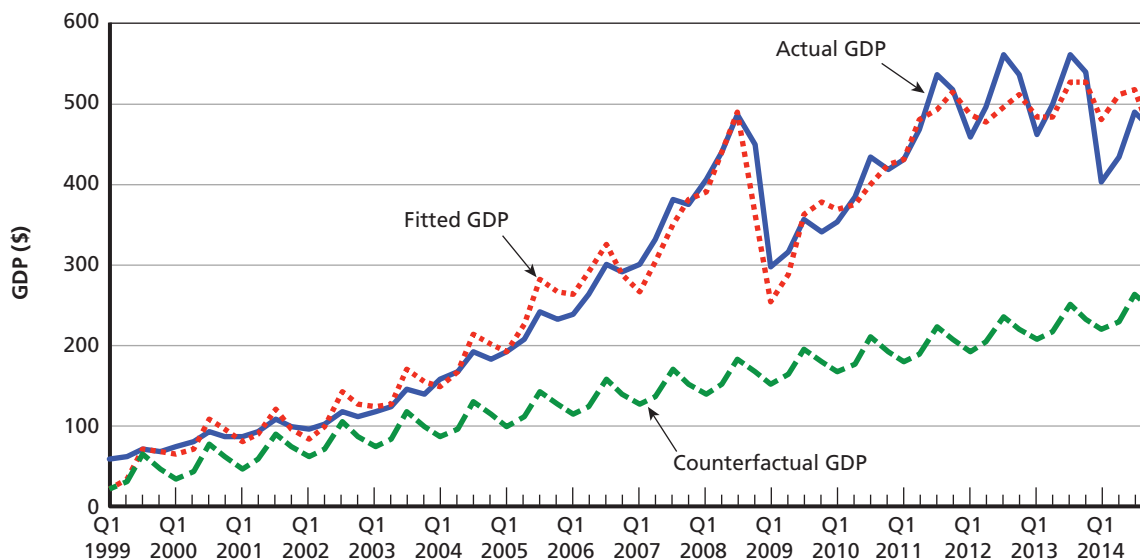
We then estimated the share of the change in GDP that might be accounted for by the change in export values between 1999 and 2008, between 2009 and 2014, and between 1999 and 2014, as follows:

$$\frac{\Delta GDP(\text{fitted}) - \Delta GDP(\text{counterfactual})}{\Delta GDP(\text{fitted})} \times 100\%.$$

Figure 2.5 graphs predicted quarterly Russian GDP valued in dollars with and without including the quarterly value of energy exports in the equation. Table 2.1 shows our results for both the equations for Russian GDP valued in constant price rubles and Russian GDP valued in 2012 dollars.

We found that the increase in energy exports, as measured in constant price dollars, may have accounted for 46 percent of the changes in GDP measured in rubles between 1999 and 2008 and 39 percent between 2009 and 2014. When Russian GDP is measured in constant

Figure 2.5
Actual, Fitted, and Counterfactual GDP in Dollars



SOURCE: Authors' calculations.

RAND RR1468-2.5

Table 2.1
Share of Change in GDP Accounted for by Change
in Export Values

	% of GDP in	
	Rubles	Dollars
1999–2008	46	68
2009–2014	39	61
1999–2014	33	55

SOURCE: RAND calculations using export data from CBR and quarterly GDP data from Rosstat.

2012 dollars, changes in the dollar value of energy exports explain 68 percent of the change in GDP between 1999 and 2008 and 61 percent of the change in GDP between 2009 and 2014. The difference in explanatory power of energy exports stems from their effect on the REER of the ruble. When oil prices are higher, contributing to higher values of energy exports, the ruble has appreciated in real effective terms against the dollar, boosting dollar-denominated GDP. These exchange rate effects account for the difference in explanatory power for constant ruble and constant dollar GDP. The explanatory power of the equation was somewhat less for the entire 1999–2014 period, running 33 percent of changes in ruble GDP and 55 percent of changes in dollar-denominated GDP.

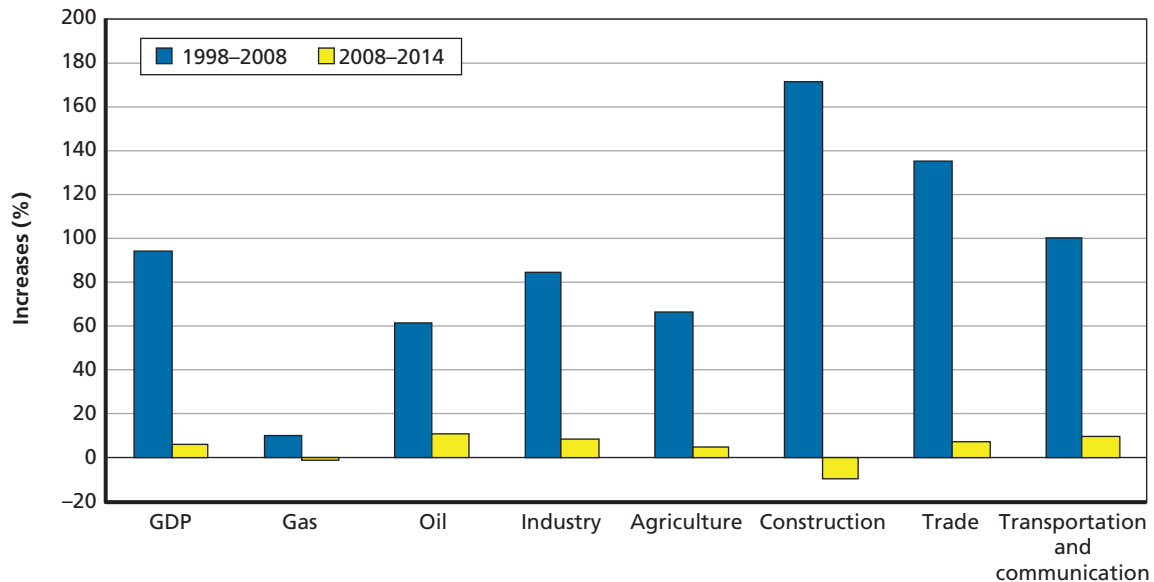
In contrast, in volume terms, oil and gas have played a much smaller role than other sectors in Russian economic growth. Between 1998 and 2008, output of gas, by volume, rose just 10.0 percent, compared to a 94-percent increase in GDP. The volume of oil output, up 61 percent, also lagged growth in GDP (Figure 2.6).

Other Sources of Growth

Between 1998 and 2008, the most dynamic sectors of the Russian economy were construction, retail and wholesale trade, and transportation and telecommunications, not oil and gas (Figure 2.6). Many of the same factors that have driven growth in other transition economies have spurred growth in Russia. As in Armenia, Georgia, and Ukraine (members of the Commonwealth of Independent States [CIS] that enjoyed rapid growth, although they lack Russia's energy riches), market disciplines and the shift from state ownership to private ownership improved the efficiency with which capital and other resources were used. As a consequence,

Figure 2.6

Cumulative Growth in Output or Value Added in Constant Rubles, 1998–2008 and 2008–2014



SOURCES: Authors' calculations based on Rosstat, "National Accounts," Moscow, various years a; Rosstat, *Russian Statistical Yearbook* [*Rossiiskii Statisticheskii Ezhegodnik*], Moscow, various years c.

Russia registered double-digit annual increases in labor productivity in manufacturing.⁷ The proliferation of private businesses also made the Russian economy much more responsive to shifts in demand. The creation of new businesses in mobile telecommunications, retail trade, and financial services resulted in rapid growth in the service sector, more rapid than in industry. These new private companies filled demands for services that were unavailable under central planning. Large increases in trade and foreign direct investment (FDI) served to integrate Russia's economy with the rest of the world, also fostering growth.

Recession and Recovery: 2008–2014

In contrast with the other four BRICS countries, where GDP continued to rise during the Great Recession, Russia's GDP fell 7.9 percent in 2009. As in the United States and Europe, the recession that began in the fourth quarter of 2008 in Russia was triggered by a banking crisis. Russian banks had rapidly increased lending during the boom years. Credit to households and enterprises surged from 5 percent of GDP in 2002 to 14 percent of a much larger pie in 2007, more than quadrupling over this period.⁸ Although, by international standards, credit as a share of GDP was still quite low in 2007, credit standards had eased. Loans for commercial and residential real estate projects and to consumers were especially risky. Moscow, in particular, experienced an overheated housing market, fueled by credit. Not surprisingly, as the economy cooled, the share of nonperforming loans in total loans rose sharply from 1.5 percent in 2006 to 10 percent in 2009.⁹ At the same time, European banks that needed to shore up capital in their home countries began withdrawing credit lines to Russian banks and borrowers. In 2009 this process accelerated, as oil prices fell and foreign lenders became more concerned about their Russian clients, leading to a full-blown run on Russian banks that was stanching by the use of Russia's reserve funds that had been built up during the years of high oil prices.

The Russian economy rebounded in 2010 and 2011, as GDP surged 4.5 and 4.3 percent, respectively, driven by increases in output in industry, trade, and transportation. However, GDP only recovered to its 2008 level in 2011. Growth then slowed to an average annual rate of just 1.7 percent per year between 2012 and 2014, far below the average annual rate of 6.9 percent during the 1999 to 2008 boom.

Many of the factors that had driven growth since 1999 dissipated during this period. After 1999, most of Russia's unemployed labor was pulled into the economy: The unemployment rate fell from 12.6 percent in 1999 to 5.2 percent in 2014, by which time Russia had reached roughly full employment. Russia's working-age population has begun to shrink, falling by a million persons per year, constraining growth in GDP.¹⁰

Between 1999 and 2008, Russia also benefited from drawing on underutilized capital and from targeted additional investments in existing production facilities that greatly improved the productivity of their operations and the quality of the final product. These measures provided

⁷ Calculated using data on industrial employment and output from Rosstat, "Russia in Figures," Moscow, various years b.

⁸ IMF, "Russian Federation: 2009 Article IV Consultation—Staff Report; Staff Statement; Public Information Notice on the Executive Board Discussion," Washington, D.C., Country Report 09/246, August 2009, p. 5.

⁹ IMF, "Russian Federation: 2010 Article IV Consultation—Staff Report," Washington, D.C., Country Report 10/246, July 9, 2010, p. 13.

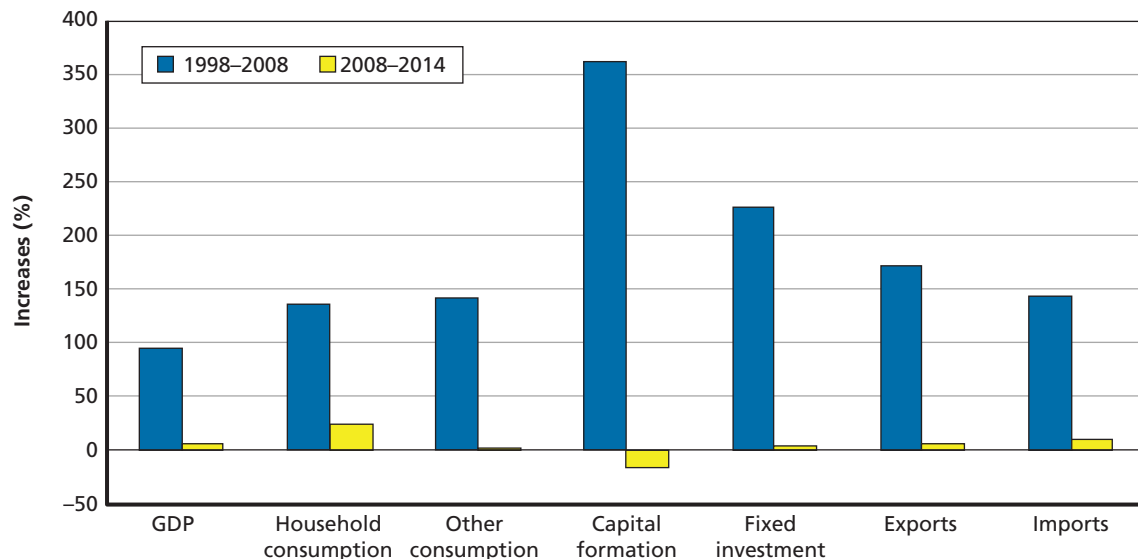
¹⁰ Calculated using data on industrial employment and output from Rosstat, various years b.

a substantial impetus to growth but were substantially played out by 2008. Investments in new capital and structural economic reforms (which have regressed in recent years) are needed to generate growth. But Russian investment in gross fixed capital fell sharply in 2009 and did not regain its 2008 level until 2012. It fell again in 2014. Russia has a low rate of investment for a country with its level of per capita GDP, averaging 20 percent between 2000 and 2014. Estonia, Kazakhstan, and Malaysia, countries with similar per capita GDPs, invest 28 percent or more of GDP, and East Asian countries at a similar stage of development as Russia often invest well over 30 percent. Russia's incremental capital-to-output ratio is low, reflecting lower rates of return on invested capital than in countries with similar income levels. As we will explore later in more depth, this is likely due to the large share of investment consisting of large, poorly chosen, poorly implemented projects by state-owned enterprises (SOEs).¹¹ As a consequence, increases in capital productivity have been modest. The relatively large share of the labor force employed by the government and SOEs also appears to have limited the rate of growth in labor productivity because neither government bureaucracies nor SOEs have made improving the efficiency of their workforces a priority. In some cases, the Russian government has discouraged large employers from releasing excess labor; to compensate, real wages of many workers have declined.

Rates of growth in end use of GDP reflect some of the weaknesses in Russia's prospects for renewed growth. Between 1999 and 2008, gross capital formation rose 362 percent, while fixed capital investment rose 227 percent, and GDP rose 94 percent. Between 2008 and 2014, GDP rose 5.8 percent in total; fixed capital investment rose 4.2 percent; and gross capital formation fell 17 percent (Figure 2.7).

Not surprisingly, the composition of growth by sector during the recent recovery has also been markedly different from what it was during the boom years. In sharp contrast to the

Figure 2.7
Cumulative Growth in GDP, by End Use, 1998–2008 and 2008–2014



SOURCES: Rosstat, various years a; Rosstat, various years c.

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¹¹ IMF, "Russian Federation Staff Report for the 2014 Article IV Consultation," Washington, D.C., Country Report 14/175, July 2014, p. 29.

1999–2008 period, the output of the oil sector rose faster than aggregate GDP between 2008 and 2014 (Figure 2.6). Although trade and industrial output recovered, on an average annual basis, growth in output from these sectors has been slow. Output of the construction industry, which rose sharply between 1999 and 2008, has fallen since 2008 because of the decline in investment.

Causes of the Current Recession

The Russian economy fell into recession in 2015. The primary causes of the decline in output were the sharp fall in the price of oil; the ensuing depreciation of the ruble and corresponding increase in inflation; rising policy barriers to private economic activity; a loss of investor confidence stemming from Putin's economic, political, and foreign policies; and Western sanctions on key parts of the Russian financial and energy sectors. In this chapter, we assess the contributions of each of these factors to the decline in output and how these factors are likely to weigh on the Russian economy in the coming years.

The Fall in Russia's Terms of Trade and Depreciation of the Real Effective Exchange Rate

A country's terms-of-trade index measures the purchasing power of its exports relative to its imports.¹ In 2013, the average Europe Brent spot price for oil was \$108 per barrel. The price started to fall sharply in the latter half of 2014, and fell into the \$35- to 50-per-barrel range in 2015.² In 2013, crude oil exports, refined oil products, and natural gas accounted for two-thirds of Russian exports.³ Assuming that the prices of Russia's main imports have not changed substantially, the drop in export values between the second quarter of 2014 and the second quarter of 2015 resulted in a 30-percent deterioration in Russia's merchandise terms of trade.⁴

This decline in terms of trade has different effects for the major end use categories of Russia's economy: household consumption; government; and investment in energy, nonenergy tradable goods, and nontradable goods. An adverse terms-of-trade shock also tends to depreci-

¹ Two commonly used measures of the terms of trade are the *net barter terms of trade*, which is equal to the ratio of the unit value index (or price level) of exports relative to that of imports, and the *income terms of trade*, which is equal to the ratio of the value of exports (price times quantity) relative to the unit value index (or price level) of imports.

² Data on Europe Brent spot price downloaded from U.S. Energy Information Administration, Petroleum & Other Liquids: Europe Brent Spot Price FOB," Web page, 2015.

³ Authors' calculations based on export data from the United Nations, *2013 International Trade Statistics Yearbook*, Vol. I, New York, 2014.

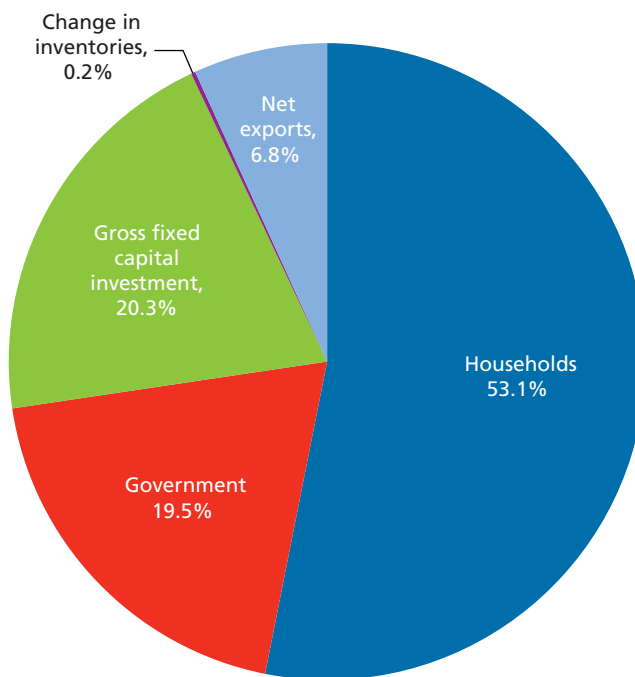
⁴ Exports and imports can be measured with or without services. For these calculations, we used the merchandise terms of trade because data on exports and imports of services for the second quarter of 2015 were not available when we made these calculations. In the last period for which data on services trade were available (first quarter of 2015) at the time of writing, services accounted for only 12 percent of the total value of Russia's exports. When we compared the estimated change in the terms of trade between the first quarter of 2014 to the first quarter of 2015 using services and merchandise trade in the calculations, the decline in the terms of trade was almost identical whether we excluded or included trade in services in the total.

ate or devalue the exchange rate. We assess the effects of a shock on each end use category, as well as on the exchange rate and on overall output in the following subsections.

Effects of an Adverse Terms-of-Trade Shock on Household Consumption

Household consumption accounts for the largest share of end use of Russia's GDP (Figure 3.1). Economic theory suggests that the adverse terms-of-trade shock for Russia affects household consumption largely through the effects of the shock on incomes. To the extent that households consume imported goods, the households either have to reduce consumption of imports, which have now become more expensive; reduce consumption of domestically produced goods to compensate for the higher cost of imported goods; or reduce savings to try to maintain former levels of consumption. If households expect the deterioration in the terms of trade to persist for a substantial time, drawing down savings is not feasible, so consumption has to fall in response to the negative income shock.⁵

Figure 3.1
Structure of Russia's End Use of GDP in 2014



SOURCE: Authors' calculations based on data from Rosstat, various years a. Consumption includes households and nonprofit institutions serving households.
NOTE: To calculate these percentages, we subtracted statistical discrepancies from total GDP and divided the components of GDP by the result. This spreads the statistical discrepancies across the five categories in proportion to their size. Numbers may not sum to 100 due to rounding.

RAND RR1468-3.1

⁵ For a summary of much of the theoretical literature on terms-of-trade shocks and consumption, see Paul Cashin, and C. John McDermott, "Terms of Trade Shocks and the Current Account: Evidence from Five Industrial Countries," *Open Economies Review*, Vol. 13, No. 3, July 2002, and Christopher Kent and Paul Cashin, "The Response of the Current Account to Terms of Trade Shocks: Persistence Matters," International Monetary Fund, WP/03/143, 2003.

An IMF study conducted prior to the recent decline in oil prices examined the relationship between changes in terms of trade and macroeconomic developments for various oil-exporting economies. The study did not include Russia, but suggests that, for other developing country oil exporters, a 10-percent decline in terms of trade is, on average, associated with a decline in long-run private consumption of approximately 1.2 percent.⁶ Extrapolating these results to the Russian case, we estimate that a 30-percent decline in Russia's terms of trade would be associated with a long-run decline in consumption in Russia of 3.6 percent.⁷

Effects of an Adverse Terms-of-Trade Shock on Final Government Demand

As noted above, taxes on energy, especially exports of oil, have been an important source of income for the Russian government, running roughly 30 percent of total general government revenues and 50 percent of federal government revenues in recent years. The decline in the export price of oil has led to a sharp decline in these tax revenues.

These effects are particularly pronounced because of the structure of two major taxes on oil: the mineral extraction tax (MET) and the export tax on oil. The MET starts with a base rate (set at 766 rubles for 2015, 857 rubles in 2016, and 919 rubles in 2017) per ton of demineralized, dehydrated, and stabilized oil. The base rate is multiplied by a coefficient that rises with the average price of Urals oil,⁸ then reduced by a certain amount, which takes into account the specificities of oil extraction, and which is itself a composite of seven other coefficients.⁹ The oil export duty on crude oil is applied to the difference between the actual price at which the oil is sold and \$182.50 per ton (\$25 per barrel). The effective export duty was \$112.9 per ton in February 2015 (when average oil prices were \$381.8 per ton). There are no export taxes on sales of oil below \$25 per barrel because this price is deemed to cover only the cost of extracting the oil, leaving this amount for the producer. Oil producers, state and privately owned, have long complained of the high marginal tax rate on oil exports that this tax imposes. As a consequence of these complaints and a sense that a lower marginal rate was likely to lead to higher production and discourage value-subtracting refining operations, the Russian government reduced the maximum marginal rate from 65 to 60 percent in 2011.¹⁰ The Russian government has further reduced the rate for 2015–2017 (Table 3.1).

Thus, MET and export tax revenues are highly dependent on the price of oil. The Russian Ministry of Finance estimated that, if oil prices were to remain around \$50 per barrel in

⁶ These figures are based on Nikola Spatafora and Andrew Warner, "Macroeconomic and Sectoral Effects of Terms-of-Trade Shocks: The Experience of Oil-Exporting Developing Countries," Washington, D.C.: International Monetary Fund, WP/99/134, 1999.

⁷ The results from the paper apply to the average trade ratio observed in their sample (33 percent). Russia's trade ratio was fairly similar (28 percent in 2013).

⁸ The coefficient is calculated as $C_p = (P-15)*R/261$, where P is the average price of Urals oil for the tax period (one month) in U.S. dollars per barrel, and R is the average value for the tax period of the exchange rate of the U.S. dollar to the Russian ruble as established by the CBR.

⁹ Russian Tax Code, Ch. 26, Art. 342.2.9, as of November 24, 2014.

¹⁰ Because of the differentials in export taxes, Russian oil companies with refinery operations have often found it more profitable to refine crude oil in Russia and export the refined oil products rather than export the crude. However, primary refining operations have often been value subtracting: A large share of refined products consisted of residual fuel oil, which was purchased at a discount by European refiners, then re-refined in European refineries. Russia receives a higher price for the crude oil than for the residual fuel oil, hence the change in the tax regime (Ernst & Young, "Oil and Gas Tax Alert: Russian Federation Oil Tax Reform," McLean, Va., September 2011).

Table 3.1
Maximum Export Duty on Crude Oil

Actual Price (USD)		Duty Should Be No More Than		
Per Ton	Per Barrel	Per Ton	Per Barrel	Period
Up to \$109.5	Up to \$15	0%		
From \$109.5 up to \$146	From \$15 up to 20	$35\% \times (\text{actual price} - \$109.5)$	$35\% \times (\text{actual price} - \$15)$	
From \$146 up to \$182.5	From \$20 up to \$25	$\$12.78 + 45\% \times (\text{actual price} - \$146)$	$\$1.75 + 45\% \times (\text{actual price} - \$20)$	
More than \$182.5	More than \$25	$\$29.2 + 42\% \times (\text{actual price} - \$182.5)$	$\$4 + 42\% \times (\text{actual price} - \$25)$	2015
More than \$182.5	More than \$25	$\$29.2 + 36\% \times (\text{actual price} - \$182.5)$	$\$4 + 36\% \times (\text{actual price} - \$25)$	2016
More than \$182.5	More than \$25	$\$29.2 + 30\% \times (\text{actual price} - \$182.5)$	$\$4 + 30\% \times (\text{actual price} - \$25)$	2017

SOURCE: Law on Customs Tariff (Updated on November 11, 2014), Ch. 1, Art. 3.1.4.

2015, budget revenues would be approximately 2.1 trillion rubles (14 percent) lower than what was planned for 2015 (based on oil at \$100 per barrel).¹¹ As of March 2015, Putin announced a revised budget assuming oil prices of \$50 per barrel and an exchange rate of 61 rubles per USD.¹² Across-the-board spending cuts of 10 percent, along with 10-percent cuts in the salaries of state officials, have been adopted.¹³

The effect of a terms-of-trade shock is likely to be highly specific to a country's tax structure, its spending priorities, and its ability to borrow. Nonetheless, findings from other oil-exporting countries suggest that a 10-percent deterioration in the terms of trade is associated with an approximately 1.7-percent decline in government consumption; thus, a 30-percent decline in the terms of trade would translate into a 5.2-percent decline in government consumption for as long as Russia's oil exports remain in the \$40- to 50-per-barrel range.¹⁴

Effects of an Adverse Terms-of-Trade Shock on Investment

The deterioration in Russia's terms of trade affects investment, as well as household consumption and government consumption. The effects on investment affect not only the oil and gas sectors but also the other economic sectors. To analyze the effects of the decline in Russia's terms of trade on investment, consider a simple, stylized model of the Russian economy, consisting of three sectors: (1) an export-oriented oil and natural gas sector, (2) a sector that produces tradable goods other than energy (which are either exported or compete with imports), and (3) a sector that produces nontraded goods and services.¹⁵ Each sector employs sector-specific capital and workers who can move between sectors. Export and import prices are taken as given, but output prices in the nontraded sector are set by Russian domestic supply and demand.

In this model, a fall in the price of oil lowers the returns to the resources employed in the oil sector, so capital investment should decline in this sector, shifting toward the nonenergy traded and nontraded sectors.¹⁶ This is known as the *resource movement effect*. At the same time, since the lower oil price also lowers the income earned by the capital and labor employed in the oil sector and the government revenues from this sector, the demand for nontraded goods and services falls, thus reducing the rate of return on capital invested in the nontraded goods sector. This *spending effect* reduces investment in the nontraded sector. For the nonenergy traded sector, both the resource movement and spending effects encourage investment because rates

¹¹ Ilya Trunin, "Who Are the Winners of the Tax Maneuver [Кто выигрывает от налогового маневра]," Press-Center of the Ministry of Finance, February 5, 2015.

¹² "Putin: The New Version of the Budget Will Be Written with the Oil Price Being \$50 Per Barrel [Путин: новая версия бюджета сверстана из цены нефти 50 долларов за баррель]," *NTV Novosti*, April 3, 2015.

¹³ Andrey Ostroukh, "Russia to Cut Officials' Salaries in Effort to Keep Economy Afloat," *Wall Street Journal*, March 6, 2015.

¹⁴ Estimates based on extrapolating, as discussed above, from Spatafora and Warner, 1999.

¹⁵ Our exposition of sectoral investment patterns is based largely on Nikola Spatafora and Andrew Warner, "Macroeconomic Effects of Terms-of-Trade Shocks," Washington, D.C.: World Bank, Policy Research Working Paper 1410, 1995.

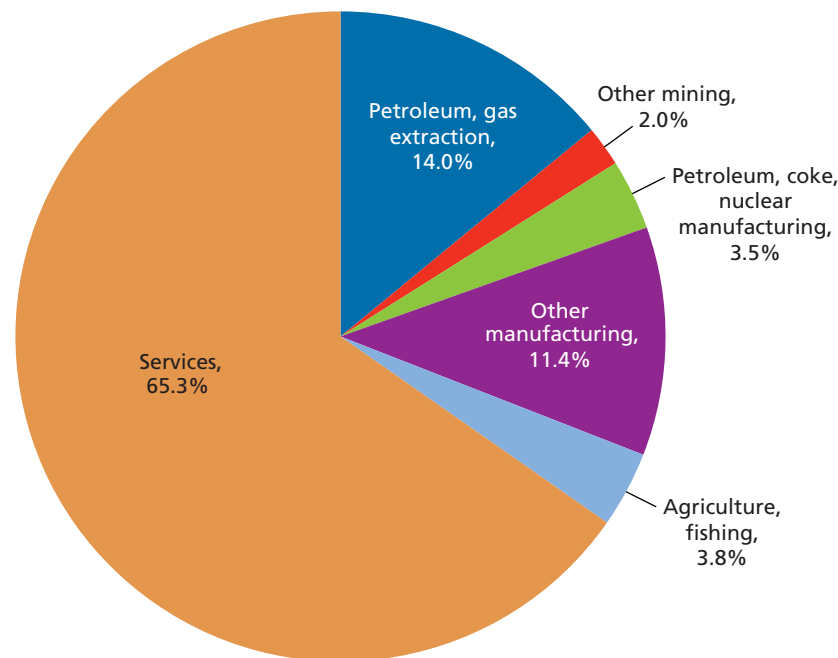
¹⁶ The same result is generated by a richer model in which capital stock has some imported content (Luis Sérvén, "Terms-of-Trade Shocks and Optimal Investment: Another Look at the Laursen-Metzler Effect," *Journal of International Money and Finance*, Vol. 18, No. 3, 1999). If capital has no imported content, the effect of a terms-of-trade shock on long-run capital stock is ambiguous; see Partha Sen and Stephen J. Turnovsky, "Deterioration of the Terms of Trade and Capital Accumulation: A Re-Examination of the Laursen-Metzler Effect," *Journal of International Economics*, Vol. 26, 1989.

of return on tradable goods should rise as they become more competitive on export markets and in competition with imports. However, these increases in demand for nonenergy tradable goods will be tempered by declines in domestic incomes, which reduce domestic demand for these and other products.

As Figure 3.2 shows, the bulk of Russian investment in gross fixed capital in 2014 was in services, primarily housing and commercial real estate. Investment in services has averaged 66 percent of total investment in gross fixed capital since 1995. The standard deviation surrounding this average is small, running just 2.5 percentage points over the 20-year period. We categorize this investment as in the nontradable sector. The second largest share of investment has gone to the oil and gas production and refining sectors. Together, these accounted for 17.6 percent of gross investment in fixed capital in 2014. Over the past 20 years, gross fixed investment in oil and gas extraction and refining has typically ranged from 13 to 18 percent of total fixed investment. The third largest component of gross fixed capital investment has been in manufacturing, which has averaged 13.3 percent of total investment between 1995 and 2014 and was 11.4 percent in 2014.

Based on these allocations, what are the likely effects of Russia's decline in terms of trade on investment in gross fixed capital? In our view, the preponderance of investment in services, especially housing, is likely to contribute to a decline in GDP because investment in housing is driven by incomes, real interest rates, and expectations for capital appreciation, all three factors that currently are having a negative effect on investment in this sector. The oil and gas sector is already experiencing a decline in investment globally as expectations concerning future rates of return have fallen sharply along with the world market price of oil. Russia is no exception. To

Figure 3.2
Fixed Investment by Sector in 2014



SOURCE: Authors' calculations based on data from Rosstat, "Investments in Non-Financial Assets," Web page, 2016a.

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compound matters for Russia, investments in oil and gas, at least by SOEs, have relied on project financing from Western banks because Russia's taxation policies have limited the ability of these companies to retain earnings for investment and because the Russian banking sector does not have the capital to finance very large, multiyear projects. Western sanctions, which have increased the cost of capital and limited the ability of Rosneft, the largest state-owned oil company, to partner with foreign oil firms, also reduce investment in this sector. These two sectors, services and oil and gas, accounted for 83 percent of total investment in gross fixed capital in 2014, and the decline in Russia's terms of trade is negatively affecting both sectors. Moreover, Russia's nonoil tradable goods sector may not be in a position to take full advantage of a more-competitive ruble. Expansion of nonoil exports would require identifying and drawing on existing, excess capacity or increasing investment; given the restrictions imposed on investment in Russia and the current climate of political and economic uncertainty, it is unlikely that companies that manufacture tradable goods will be able to increase capacity substantially.¹⁷

As a consequence of these effects, the Russian Ministry of Economy has estimated that gross investment in fixed capital will decline by 13.7 percent in 2015.¹⁸ In the long run, estimates from other oil-exporting economies suggest that a 10-percent decline in the terms of trade leads to a 2.9-percent decrease in overall investment.¹⁹ Thus, a 30-percent decline in the terms of trade would suggest an 8.7-percent decline in long-run fixed investment in Russia.

Effects of an Adverse Terms-of-Trade Shock on the Balance of Payments

Both consumption and investment responses affect the current account. In general, empirical work shows that a fall in the terms of trade is associated with a deterioration in the balance of trade.²⁰ However, recent work indicates that a persistent terms-of-trade shock is associated with a small increase in the current account balance in the short run and an insignificant decline in the longer term.²¹

Russia's current account balance has remained positive through the recent oil price shock. Although the value of exports has fallen substantially, this decline has been matched by a decline in imports due to the depreciation of the ruble and falling real incomes and investment. Russia's ban on imported foodstuffs from the United States, Canada, the European Union, and allied countries, imposed in August 2014, may also have contributed to the decline in imports, as domestic production of food has substituted for some of these imports.²² Consequently, Russia's trade balance remains positive. The recession and the depreciation of the ruble have reduced outward remittances, which has also contributed to keeping the current account positive.²³

¹⁷ World Bank, *Russia Economic Report: The Dawn of a New Economic Era?* Washington, D.C., No. 33, April 2015a.

¹⁸ Aaron Eglitis, "Russian Wages Plunge More Than Forecast as Consumer Demand Reels," *Bloomberg Business*, March 19, 2015.

¹⁹ Estimates based on extrapolating, as discussed above, from Spatafora and Warner, 1999.

²⁰ Enrique Mendoza, "The Terms of Trade, the Real Exchange Rate, and Economic Fluctuations," *International Economic Review*, Vol. 36, No. 1, 1995; G. Otto, "Terms of Trade Shocks and the Balance of Trade: There Is a Harberger-Laursen-Metzler Effect," *Journal of International Money and Finance*, Vol. 22, No. 2, April 2003.

²¹ Kent and Cashin, 2003.

²² Paul Sonne and Anton Troianovski, "Russia Bans Food Imports in Retaliation for Western Sanctions," *Wall Street Journal*, August 7, 2014.

²³ World Bank, 2015a.

Effects of an Adverse Terms-of-Trade Shock on the Real Effective Exchange Rate and Inflation

An adverse terms-of-trade shock reduces the amount of foreign currency exporters earn, lowering the supply of the foreign currency for domestic foreign exchange markets. As a consequence, a decline in terms of trade usually results in a depreciation or devaluation of the exchange rate, making exports more competitive and imports more expensive, triggering the necessary shifts in economic activity outlined in the previous section.

In a floating rate system, the terms-of-trade shock is immediately transmitted to economic actors, triggering adjustment. However, floating exchange rates are determined not just by the supply of foreign exchange from exports and the demand for foreign exchange for imports; currencies are both assets and means of exchange. With pure floats, exchange rate markets may overshoot. If market participants perceive that the value of the domestic currency is likely to fall, demand for assets priced in the domestic currency declines and demand for foreign currency assets rises. If the exchange rate overshoots, changes in asset markets can compound increases in domestic real interest rates, resulting in larger declines in investment than if exchange rates had remained higher.

Exchange rates affect inflation in open economies in which imports constitute an appreciable share of consumption and investment. In these economies, rapid depreciations feed into consumer prices and wholesale price inflation. A terms-of-trade shock is a one-off event, so it may just raise the price level once, after which inflation may return to previous trajectories. However, the central bank may attempt to cushion the effect of a rapid depreciation on the real economy by partially accommodating the depreciation through monetary policy. As a consequence, exchange rates often experience echo effects as depreciation is followed by an injection of money into the financial system, which is then followed by an increase in inflation, which leads to a further decline in demand for domestic assets, which leads to further depreciation, and so on.

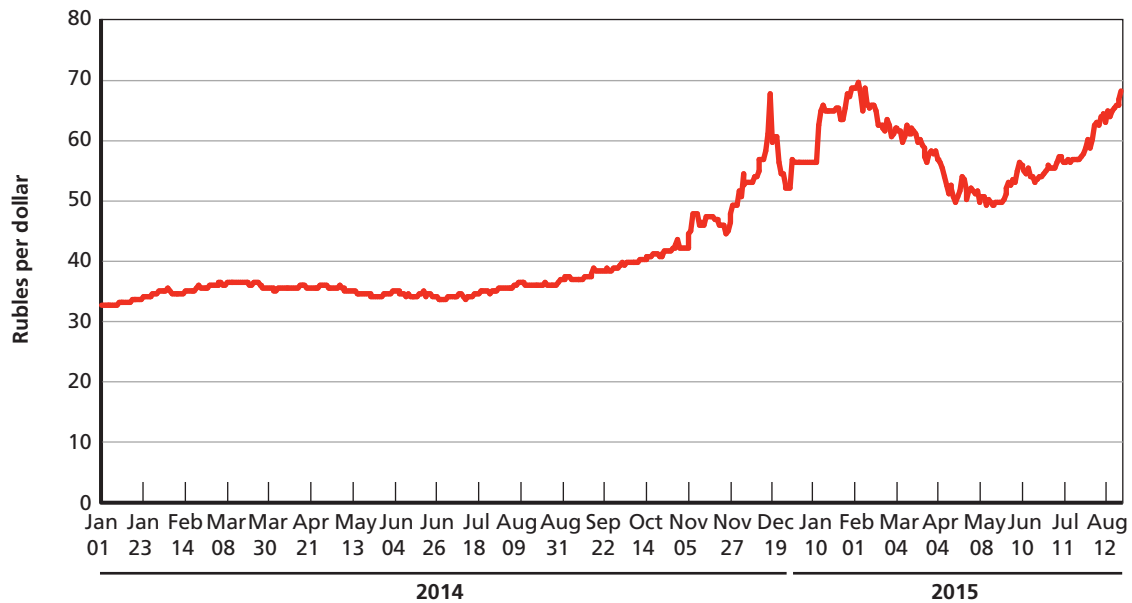
In pegged or managed exchange rate systems, the central bank can try to keep the exchange rate steady by drawing down reserves to preserve the peg while increasing interest rates to encourage capital inflows, expediting the adjustment process. It can also try to manage the exchange rate adjustment through a series of devaluations coupled with exchange rate market interventions and tightening monetary policy. The government can also affect the process through fiscal policy, either cushioning the decline through an expansionary policy or pushing for faster adjustment through contractionary policies.

The advantage of pegged or managed exchange rate systems is that they can mitigate overshooting, thereby keeping inflation lower than it otherwise would be. A disadvantage is that the central bank may try to support the exchange rate too long, running through reserves. When reserves run out, the ensuing depreciation of the exchange rate can be very large, resulting in a substantial surge in inflation. The central bank may also push interest rates too high, threatening the solvency of the banking system and leading to a precipitous decline in output.

Russia's Exchange Rate Policies

Prior to the terms-of-trade shock, the CBR used a soft peg to manage the exchange rate, employing a basket composed of the dollar and the euro, a policy adopted in 2011. After the imposition of sanctions and the terms-of-trade shock, the CBR was forced to let the ruble depreciate in the face of intensified market pressures (Figure 3.3). Even though it let the ruble slide, the CBR spent a substantial share of reserves supporting the ruble. Between December

Figure 3.3
Nominal Daily Ruble-Dollar Exchange Rate, 2014–August 2015



SOURCE: "United States Dollar (USD) and Russian Ruble (RUB) Year 2015 Exchange Rate History—The Central Bank of the Russian Federation," Online Currency Converter website, 2015.

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2013 and December 2014, Russia's reserves fell \$125 billion, from \$510 billion to \$385 billion (Figure 3.4). Despite this expenditure of reserves, the CBR was unable to maintain the soft peg. On November 10, 2014, the CBR announced that it would move to a floating foreign exchange rate system.²⁴ However, it has retained the option of intervening in foreign exchange markets "in case of financial instability."²⁵

Imports make up 15 to 20 percent of Russia's basket of consumer goods.²⁶ Consequently, the depreciation of the exchange rate was followed by a surge in consumer price inflation: By April 2015, year-on-year inflation had risen sharply, from 7 percent the previous spring to 16.4 percent (Figure 3.5). The increase in consumer prices was compounded by Russia's ban on various food imports from the West. The import ban had a particularly negative effect on middle- and lower-income households, for which food accounts for approximately 40 percent of consumption.²⁷ Wages have not kept up with inflation: Inflation-adjusted wages fell by nearly 10 percent over this same period, between April 2014 and April 2015.²⁸

Dividing the decline in the exchange rate by changes in the rate of inflation and conducting the same exercise for Russia's major trading partners yields the REER. Figure 3.6 presents IMF estimates of changes in the ruble's REER. As the figure shows, the REER of the ruble fell

²⁴ "Russia Ends Dollar/Euro Currency Peg, Moves to Free Float," RT Business, November 10, 2014.

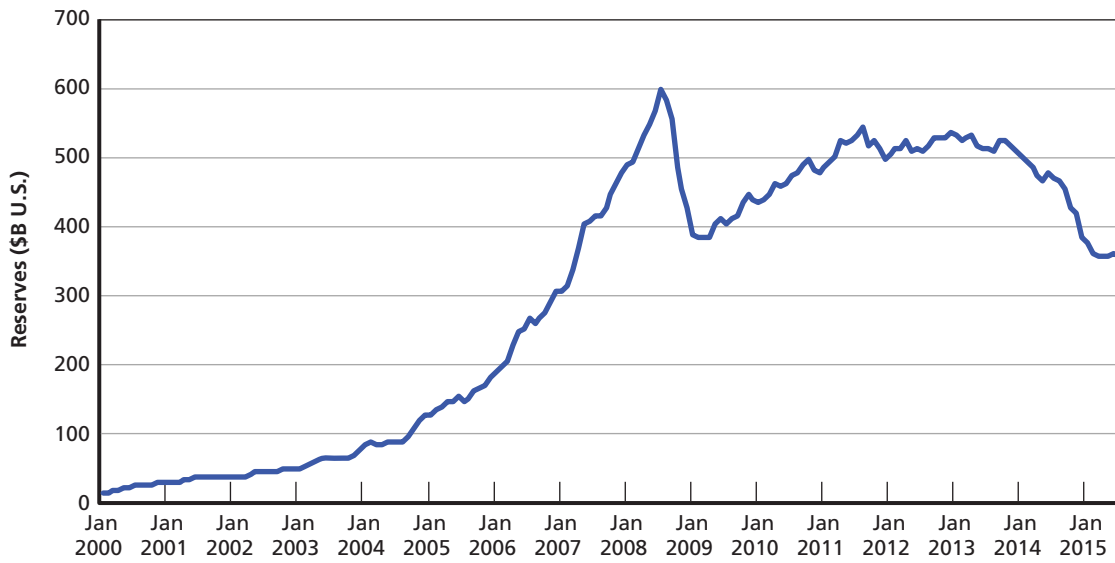
²⁵ CBR, "The Bank of Russia FX Policy," November 13, 2014.

²⁶ World Bank, 2015a.

²⁷ Sergey Aleksashenko, "The Ruble Currency Storm Is Over, but Is the Russian Economy Ready for the Next One?" Washington, D.C.: Brookings Institution, May 18, 2015.

²⁸ Eglitis, 2015.

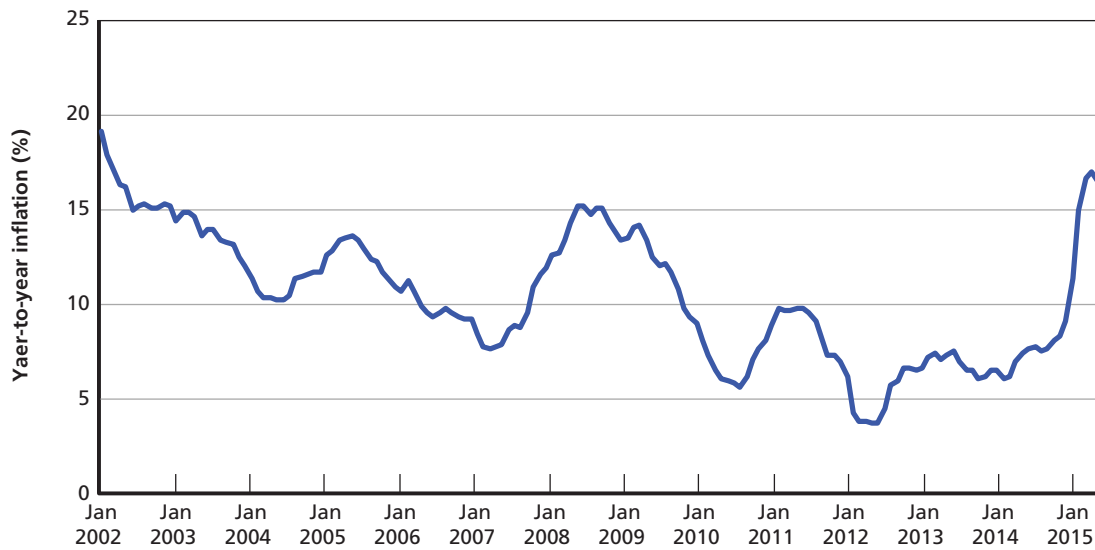
Figure 3.4
Russia's Official Reserves of Foreign Currencies



SOURCE: CBR, "International Reserves of the Russian Federation," Web page, 2016.

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Figure 3.5
Consumer Price Index



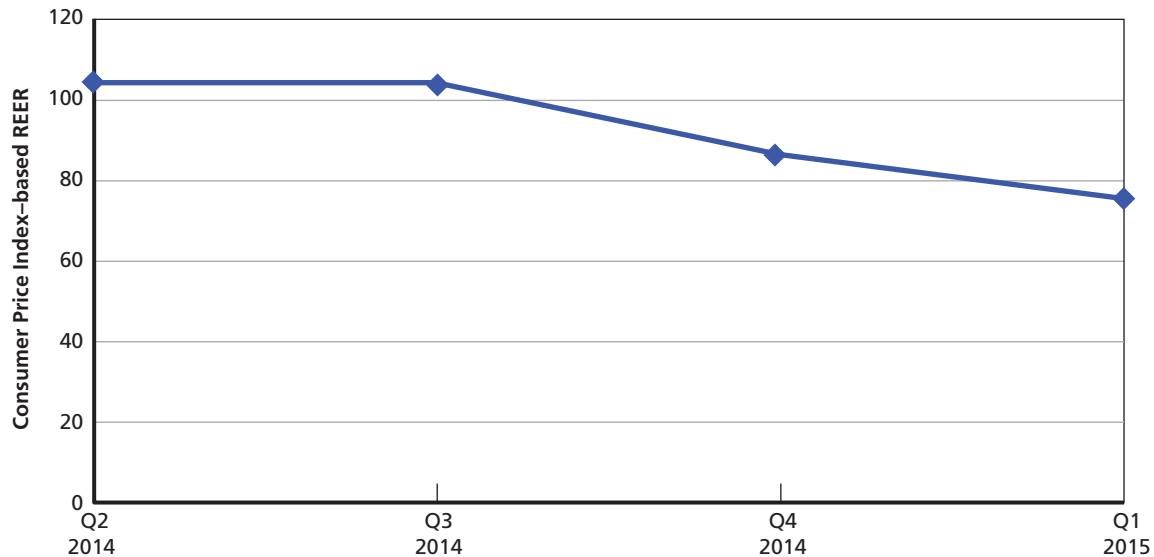
SOURCES: For 2002–2014, Rosstat, "Consumer Price Indices for the Russian Federation in 1991–2016," Web page, updated April 8, 2016a; CBR, "Inflation in the Consumer Market," Moscow, April 2015.

RAND RR1468-3.5

by 35 percent through early 2015. Since then, the REER of the ruble has fluctuated, appreciating in the spring but then falling again in August 2015.²⁹

²⁹ CBR, "External Sector Statistics," undated.

Figure 3.6
Consumer Price Index–Based Real Effective Exchange Rate



SOURCE: IMF, undated; data as of May 27, 2015.

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A number of studies have linked changes in the terms of trade and the price of oil with the REER in several oil-exporting countries. For Russia, estimates of the long-run elasticity between real oil prices and the REER are around 0.3 to 0.5.³⁰ That is, the 50-percent decline in oil prices between 2013 and 2015 (from \$108/barrel to \$56/barrel) would be associated with a 15- to 25-percent decline in the REER. More broadly, empirical evidence indicates that developing countries with flexible exchange rates that faced terms-of-trade shocks saw substantial depreciation both in their nominal exchange rates and their REERs. In these settings, depreciation can partially offset the effects of adverse terms-of-trade shocks. The logic behind this is that a depreciating currency makes exports more competitive, thus partially mitigating the effects of lower export prices on output. Thus, countries with flexible exchange rates tend to experience higher inflation, but smaller declines in output, than similar countries with fixed exchange rates.³¹ These studies suggest that the effect of the decline in oil prices on Russia's GDP is likely to be offset to some extent by the concurrent fall in the REER of the ruble.

Effects of an Adverse Terms-of-Trade Shock on GDP

Table 3.2 shows our estimates of a permanent decline in three of the five major components of Russian GDP—consumption, government, and gross fixed capital investment—stemming from a 30-percent deterioration in Russia's terms of trade. We assume that any changes in

³⁰ Virginie Coudert, Cécile Couharde, and Valérie Mignon, "Do Terms of Trade Drive Real Exchange Rates? Comparing Oil and Commodity Currencies," Paris: CEPII, Working Paper No. 2008-32, 2008.

³¹ Christian Broda and Cedric Tille, "Coping with Terms-of-Trade Shocks in Developing Countries," *Current Issues in Economics and Finance*, Vol. 9, No. 11, November 2003.

Table 3.2
RAND Estimates of the Impact of the Decline in Russia's Terms of Trade on GDP

	Household Consumption	Government Consumption	Gross Investment in Fixed Capital	Change in Inventories	Net Exports
Percentage of GDP	53.1	19.5	20.3	0.2	6.8
Percentage decline	-3.6	-5.2	-8.7	0.0	0.0
Percentage reduction in GDP	-1.9	-1.0	-1.8	0.0	0.0

SOURCE: Authors' calculations based on data from Rosstat.

inventories will eventually net out and that the fall in exports is offset by a corresponding decline in imports, leaving net exports (the trade balance) largely unchanged. We estimate that declines in consumption will lead to a 1.9–percentage-point decline in GDP, a 1.0–percentage-point decline in government consumption, and a 1.8–percentage-point decline in investment in gross fixed capital.

Previous empirical work found a long-run relationship between oil prices and Russian GDP that suggests that a 10-percent decline in the price of oil is associated with a 2.2- to 2.5-percent long-run decline in GDP.³² If we were to apply the 50-percent decline in the price of oil to this result, the shock would result in a likely fall of 11 to 12.5 percent compared to what Russian GDP would be if oil and natural gas prices had not fallen. However, as noted above, the effect of the decline in oil prices on Russia's GDP is likely to be offset to some extent by the concurrent depreciation in the REER of the ruble. Long-run estimates of the relationship between the oil price, the real exchange rate, and Russian GDP suggest that, while a 10-percent decline in oil price is associated with a 2.2-percent decline in GDP, a 10-percent decline in the real exchange rate is associated with a 2.7-percent increase in GDP.³³ Thus, while a 50-percent decline in the price of oil would be associated with an 11-percent fall in long-run GDP, the concurrent 28-percent decline in the REER would be associated with a 6.7-percent increase in long-run GDP, offsetting the GDP decline to a large extent.

How precise are these estimates? Researchers generally employ confidence intervals around parameter estimates to provide readers with a range. However, in the case of these estimates, either confidence intervals were lacking or the models used to generate the point estimates could not easily be used to generate confidence intervals. For example, the estimate for the increase in GDP due to the increase in oil prices is based on the work of Jouko Rautava, who used a cointegration model to estimate the long-run relationship between oil prices, the REER, and GDP and did not provide confidence intervals for the parameter estimates.³⁴ Furthermore, in light of the rough nature of the estimates, we felt that confidence intervals would suggest that the estimates are more precise than they actually are.

³² Jouko Rautava, "The Role of Oil Prices and the Real Exchange Rate in Russia's Economy: A Cointegration Approach," *Journal of Comparative Economics*, Vol. 32, No. 2, June 2004; Katsuya Ito, "Oil Price and Macroeconomy in Russia," *Economics Bulletin*, Vol. 17, No. 17, 2008.

³³ Rautava, 2004.

³⁴ Rautava, 2004.

Renationalization or Deprivatization

In this section, we measure the scale of renationalization, or “deprivatization,” which it is sometimes called in Russia, and the increase in state control of the Russian economy since 1999. We then evaluate the effects of these changes on the Russian economy and their implications for Russia’s longer-term economic growth.

Economic Consequences of State Ownership

Economic theory indicates, and empirical evidence supports, the findings that SOEs operate less efficiently, are less innovative, and generate lower rates of return on invested capital than privately owned firms. These findings can be traced to state ownership in and of itself, the political environment in which SOEs operate, and the additional constraints and regulations under which they tend to operate compared to private-sector firms.³⁵ For example, political leaders sometimes task chief executive officers of SOEs to make unprofitable investments that support government political objectives or the personal interests of specific leaders. These objectives often shift, as political power shifts, limiting the ability of large SOEs to adapt and conduct business efficiently in domestic and international markets.³⁶

Corporate governance also suffers in SOEs. Loyal political allies, including recent or current government officials, may be given top-level executive and board-level positions in SOEs, giving them control of or substantial influence over the operations of the SOEs. Because they owe their positions to political leaders, these leaders may have great influence over SOEs. Managers of large SOEs are, for example, frequently asked to increase employment or refrain from layoffs in regions or at times that are politically sensitive. Not surprisingly, studies find that SOEs tend to employ more labor than private firms in the same industry of a similar size in terms of revenues.³⁷ SOEs are often asked to pursue noncommercial goals. For example, Gazprom was required to provide \$4.9 billion for the 2014 Sochi Winter Olympics.³⁸ Rosneft and Gazprom finance social programs in oil- and gas-producing regions. In response to political pressure, Russian Railways had to bail out the ailing KIT finance company.³⁹

SOEs generally face weaker budget constraints than private-sector firms because, directly or indirectly, they have access to state funding, reducing financial pressures to improve performance. For example, in Russia, SOEs have preferential access to financing over private borrowers at a time when international capital markets are mostly closed to Russian borrowers because of Western sanctions and perceptions in Western capital markets of high political risk in Russia. Official or unofficial exemptions from bankruptcy rules dampen pressures to reduce costs and increase profitability. However, these firms may face constraints on new investment

³⁵ Ann P. Bartel and Ann E. Harrison, “Ownership Versus Environment: Disentangling the Sources of Public-Sector Inefficiency,” *Review of Economics and Statistics*, Vol. 87, No. 1, February 2005.

³⁶ William L. Megginson and Jeffrey M. Netter, “From State to Market: A Survey of Empirical Studies on Privatization,” *Journal of Economic Literature*, Vol. 39, No. 2, June 2001.

³⁷ Alan Krueger, “Government Failures in Development,” *Journal of Economic Perspectives*, Vol. 4, No. 3, 1990.

³⁸ Martin Müller, “After Sochi 2014: Costs and Impacts of Russia’s Olympic Games,” *Eurasian Geography and Economics*, Vol. 55, No. 6, May 2015, p. 637. A detailed accounting of various entities’ Sochi-related expenses can be found in The Anti-Corruption Foundation, *Sochi 2014: Encyclopedia of Spending*, 2014.

³⁹ Martin Russell, “The Russian Economy: Will Russia Ever Catch Up?” European Parliamentary Research Service, March 2015, p. 9.

because the proposed investment may be considered part of government borrowing and may therefore run into state financing constraints.

Because of their financial stakes, shareholders in private firms internalize the costs of monitoring and conduct more-efficient management oversight than do civil servants or state-appointed boards of directors who oversee SOEs. As a consequence, when state ownership is dominant in a particular sector, performance suffers, imposing substantial costs on the economy.⁴⁰

In light of all these factors that reduce economic efficiency and profitability, why do so many governments continue to own and operate SOEs? The ability to quietly benefit top leaders personally and to award their supporters is an important driver of state ownership in many countries. A second reason is to limit the emergence of private owners who might use their wealth and status to challenge the political status quo. For example, for this reason, a decade ago Yukos owner Mikhail Khodorkovsky was arrested and his property seized. Third, state ownership can prevent the extraction of rents by private monopolies in the provision of electricity and water.⁴¹ However, in countries that, like Russia, have rampant regulatory capture and corruption, state ownership can actually facilitate the extraction of rents by the favored individuals who control the utilities. A number of governments have used state ownership as a means of increasing overall investment in gross fixed capital and directing investment to specific industries; Stalin's Soviet Union and Mao Tse-Tung's China are two extreme cases. Enforced savings and directed investments accelerated reported rates of growth in both countries, although subsequent analyses have determined that these reported rates of growth substantially exceeded revised estimates of rates of growth.⁴² SOEs can be used to develop new industries, such as those that are often considered more technologically advanced or related to national defense. However, here, too, the costs of investing in these types of industries may well exceed the value they subsequently generate.

Economic Policy Trends and Renationalization

Since its reemergence from the former Soviet Union, one can identify seven periods of policy and structural changes in the Russian economy:

1. 1991–1994: transition to markets, privatization of smaller businesses, transition recession, and high inflation
2. 1995–1998: stabilization, privatization of large businesses, and the balance-of-payments crisis of 1998
3. 1999–2003: economic recovery
4. 2003–2008: economic growth and renationalization of state-owned assets in strategic industrial sectors
5. 2009: recession
6. 2010–2014: recovery and further renationalization
7. 2015: sanctions and recession.

⁴⁰ Przemyslaw Kowalski, Max Büge, Monika Sztajerowska, and Matias Egeland, "State-Owned Enterprises: Trade Effects and Policy Implications," Paris: Organisation for Economic Co-operation and Development (OECD), 2013.

⁴¹ A useful survey of the literature can be found in Megginson and Netter, 2001.

⁴² Ofer, 1988.

As in other transition economies, most of the formerly state-owned sector in Russia was privatized during the 1990s. Small businesses quickly emerged in retail, personal services, transportation, and other such activities, either through the privatization of formerly state-owned stores, repair shops, and other smaller entities or through the creation of new businesses. The privatization of small establishments between 1991 and 1994 was, by and large, not contentious, although disputes emerged concerning who was to acquire better-situated stores or better-equipped repair shops. However, as in other transition economies, the privatization of larger enterprises, some of which were valuable but many of which were not, was much more problematic, marred by corruption or sales at knockdown prices stemming from the economic turmoil of the time. A new business class, the *oligarchs*, acquired substantial holdings of formerly state-owned assets, especially between 1995 and 1999. In particular, the loans-for-shares program in 1995 resulted in a massive transfer of state-owned assets to the oligarchs; assets acquired in the energy and metals sectors were especially valuable.⁴³

After Putin was elected president in 2000, he made some conciliatory gestures toward the oligarchs. However, shortly thereafter, he began restoring state control over Russia's mass media outlets, starting with several major private Russian television networks in 2001. The Russian government renationalized the main holdings of several oligarchs, including Channel 1 under Boris Berezovsky's control, which was Russia's largest television network; the Media-Most holding company; the NTV channel; the newspaper *Segodnya*; *Itogi* magazine (controlled by Vladimir Gusinsky), and Russia's TV6 channel (controlled in part by Badri Patarkatsishvili, a partner of Berezovsky).

Table 3.3 lists the largest Russian companies that have been renationalized since 2003. We define *renationalization* as the transfer of corporate control from private to state hands, resulting in consolidation of a majority (above 50 percent) or a blocking minority (above 25 percent but below 50 percent) of voting rights by the federal government or a company controlled by the federal government. The companies were taken from a registry of Russia's largest companies as ranked by Expert RA, a Moscow-based private rating agency. Shifts toward state control have been large overall, especially during Putin's three presidential terms. As shown in the table, most state takeovers occurred between 2003 and 2009, with another major oil company, TNK-BP, taken over early in Putin's third term in 2013.

The most dramatic event marking the shift to renationalization came in 2003, when the Russian government forced Yukos into bankruptcy. In 2003, Yukos produced about 20 percent of Russia's oil. Yuganskneftegaz, Yukos' most valuable subsidiary, was auctioned off and eventually bought by a state oil company, Rosneft. The state managed to acquire controlling stakes in four of Russia's ten largest companies—Gazprom, Yukos, TNK-BP, and Sibneft—all in the oil and gas industry. The state also reestablished control over four other companies ranked among Russia's 40 largest by revenue: AvtoVAZ, a car manufacturer; Sroytransgaz, an oil and gas engineering and construction company; Bashneft, another oil company; and Kamaz, a truck manufacturer. However, the Russian state sold its majority stake in AvtoVAZ in June 2014 to Renault-Nissan, which now owns a majority stake.

At their peaks before renationalization, the market capitalization of many of these companies was large. Yukos was worth \$32.8 billion in 2003. Gazprom was valued at \$46.7 billion in 2004, the year before the state retook majority control. In 2012, the year before the state

⁴³ Anders Åslund, *Russia's Capitalist Revolution*, Washington, D.C.: Peterson Institute for International Economics, October 2007.

Table 3.3
Renationalization of Large Russian Companies Since 2003

Takeovers	Rank by 2003 Sales	Industry	Date	Achieved Control
Gazprom ^a	1	Oil and gas	June 2005	Majority
Yukos	5	Oil and gas	December 2004	Majority
TNK-BP	6	Oil and gas	March 2013	Majority
Sibneft	9	Oil and gas	October 2005	Majority
AvtoVAZ ^b	13	Automotive	October 2005	Majority
Stroytransgaz	29	Construction	December 2008	Majority
Bashneft	30	Oil and gas	March 2009	Majority
Kamaz	37	Automotive	June 2010	Blocking minority
Fosagro	43	Engineering	December 2008	Blocking minority
Novatek	60	Oil and gas	July 2006	Blocking minority
United Heavy Machinery	62	Engineering	November 2005	Majority
Irkut	66	Engineering	June 2008	Majority
Itera Group ^c	70	Oil and gas	December 2006	Majority
UMPO	87	Engineering	December 2008	Majority
Transmashholding	90	Engineering	December 2007	Blocking minority

SOURCE: Lucy Chernykh, "Profit or Politics? Understanding Renationalizations in Russia," *Journal of Corporate Finance*, Vol. 17, No. 5, 2011.

^a Although Gazprom has been under Russian government control throughout its existence as a corporation, the Russian government had sold a majority stake in the corporation to private investors through an initial public offering and other measures. The Russian government reacquired a majority stake in June 2005 through the acquisition of an additional block of shares, raising its direct ownership in Gazprom from 38.37 to 50 percent plus one share.

^b Renault–Nissan acquired a controlling stake in AvtoVAZ in June 2014.

^c Formally, the Itera Group remains a private company. However, Gazprom has acquired controlling stakes in all Itera's major assets, including Sibneftegaz.

bought majority control of TNK-BP, its market capitalization was estimated at \$21.7 billion. Sibneft, valued at \$10.9 billion in 2003, was also absorbed by Rosneft.

Trends in State Ownership in Russia

Renationalization has led to a sharp shift back to state ownership in terms of productive assets. In 2003, the 20 largest SOEs in Russia accounted for 18.4 percent of the total market value of Russian companies listed on Russian exchanges. By 2012, this had risen to 42.2 percent.⁴⁴ Radygin, Simachev, and Entov have offered estimates of the shares of companies owned by

⁴⁴ Calculated from data from Dow Jones, "Emerging Market Indices," Web page, undated, and Expert RA, "Ranking of Russia's Largest Companies by Sales Volume, 2014," Web page, undated b. The total stock market capitalization of Russian firms on domestic exchanges in 2003 was \$231 billion. Of this, \$43 billion (18.4 percent) consisted of the value of listed SOEs. In 2012, the total stock market capitalization of Russian firms was \$875 billion, of which \$370 billion was the value of SOEs, 42.2 percent of the total.

the state in the total market capitalization of Russian listed companies ranging from 50 to 65 percent.⁴⁵

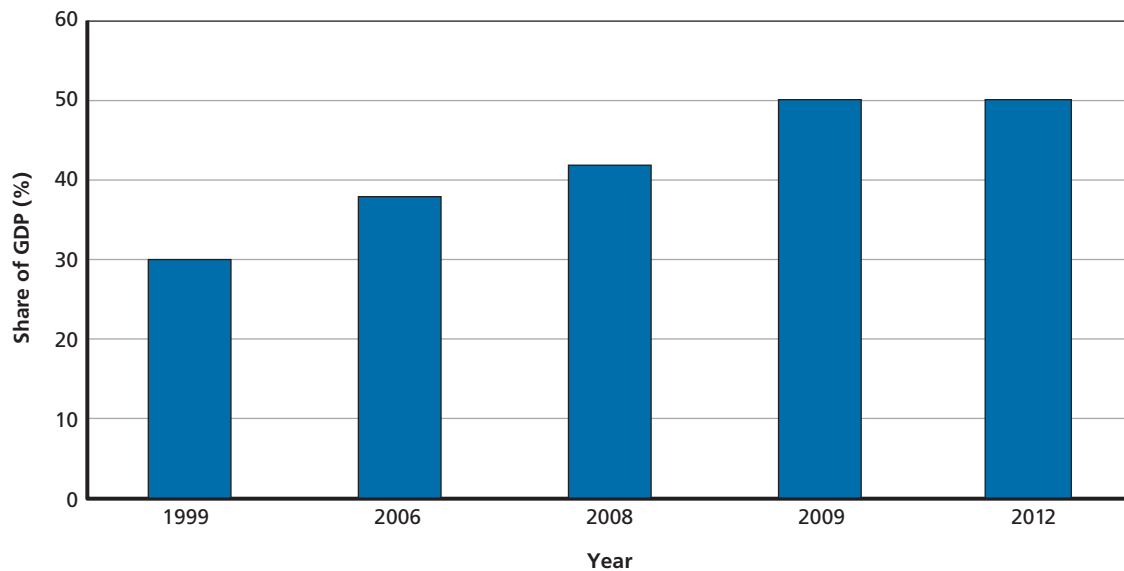
The share of Russia's GDP generated by SOEs has also risen. During the 1990s, the share of output in the Russian economy generated by the state-controlled sector shrank, and the share of the private sector grew rapidly. By 1999, the state-controlled sector contributed only 30 percent to GDP (Figure 3.7). This trend reversed in the following decade. By 2009, the state-owned share was estimated to generate 50 percent of Russia's GDP, a share that is estimated to have remained stable through 2012. In total, the share of GDP generated by state-controlled companies rose by 20 percentage points between 1999 and 2014. Although higher prices for oil and natural gas, which are produced predominantly by state-controlled companies, contributed to the reversal of the trend in the 1990s for the private sector to generate a higher share of GDP, the primary driver of the shift toward SOEs generating a higher share of GDP has been the renationalization of so many of Russia's largest companies (see Table 3.3).

State-Owned Enterprises and Economic Policy in Russia

In Putin's Russia, businesses have been renationalized for several reasons, including the following:

1. to punish or deter opponents and reward supporters
2. to target specific industrial sectors for development
3. to control strategic industries like armaments and oil and gas.

Figure 3.7
Share of Russian GDP Generated by State-Owned or -Controlled Enterprises



SOURCES: The data for 1999 are from European Bank for Reconstruction and Development, *Transition Report 1999: Ten Years of Transition*, London, 1999. The data for 2006 are from the Egor Gaidar Foundation and the remaining data are from Russian Ministry of Economy, all as reported in Julia Tsepliaeva and Yury Eltsov, "Russia: The Land of the Bountiful Giants," BNP Paribas, 2012, pp. 1–2.

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⁴⁵ Alexander Radygin, Yury Simachev, and Revold Entov, "The State-Owned Company: 'State Failure' or 'Market Failure'?" *Russian Journal of Economics*, Vol. 1, No. 1, 2015, p. 64.

Renationalization has been used to punish oligarchs considered insufficiently loyal to Putin and to deter others from backing political opponents. The most notable instance was when Russian security services arrested Mikhail Khodorkovsky, the principal shareholder in Yukos, Russia's most valuable private oil company, on spurious charges of fraud and tax evasion to punish him for becoming politically active. As noted above, Yukos was forced into bankruptcy and acquired by Rosneft. Khodorkovsky served eight years in a Siberian prison before being released on the eve of the 2014 Winter Olympics in Sochi.

Putin has given political supporters positions in management or on the boards of state-controlled companies. Former Deputy Prime Minister Igor Sechin, a confidant of Putin and a member of a group of close associates from the security or military services referred to as the *siloviki*, is executive chairman of Rosneft. Other members of the *siloviki* who have benefitted from renationalized assets include Viktor Ivanov (board chairman of Aeroflot), Sergei Chemezov (chief executive officer of Rostec), and Vladimir Yakunin (president of Russian Railways until 2015).⁴⁶

Table 3.4 illustrates the transfer of ownership or control of some of Russia's largest firms in 1996 from the oligarchs who had acquired these assets when Boris Yeltsin was president to Putin supporters who either manage or have stakes in renationalized state-owned or state-controlled enterprises. Daniel Treisman has noted that supporters of Putin, from both outside and inside the power ministries, have benefited from renationalization. He calls Kremlin-connected politicians and associates of Putin who have assumed major roles in industry but who are outside the power ministries *silovarchs* to distinguish them from the *siloviki*.⁴⁷ These *silovarchs* have taken top-level executive and board of directors' positions.⁴⁸ In most instances, the renationalized companies have remained at least partially privately owned, so supporters can be rewarded with shares of stock, which can then be resold on equity markets.

Table 3.4
Shift from Oligarchy to "Silovarchy," 1996 and 2006

Oligarchs	Oligarch-Controlled Companies		Silovarch-Controlled Companies	
	1996	2006	Silovarchs	2006
Boris Berezovsky, Roman Abramovich	AvtoVAZ, Aeroflot, ORT, Sibneft		Viktor Ivanov	Aeroflot, Almaz- Antei
Vladimir Gusinsky	NTV		Sergei Chemezov	Rosoboronexport, AvtoVAZ
Rem Vyakhirev	Gazprom		Alexei Miller	Gazprom, Sibneft, NTV, OMZ
Mikhail Khodorkovsky	Yukos (including Yuganskneftegaz)		Igor Sechin	Rosneft, Yuganskneftegaz
Vladimir Potanin	Norilsk Nickel, Silovye Mashiny	Norilsk Nickel	Vladimir Yakunin	Russian Railroads
Mikhail Fridman	Alfabank, TNK	Alfabank, TNK-BP		

SOURCE: Treisman, 2007.

⁴⁶ Daniel Treisman, "Putin's Silovarchs," *Orbis*, Vol. 51, No. 1, 2007.

⁴⁷ Treisman, 2008.

⁴⁸ Olga V. Kryshchanovskaya, "Sovietization of Russia 2000–2008," *Eurasian Review*, Vol. 2, 2009.

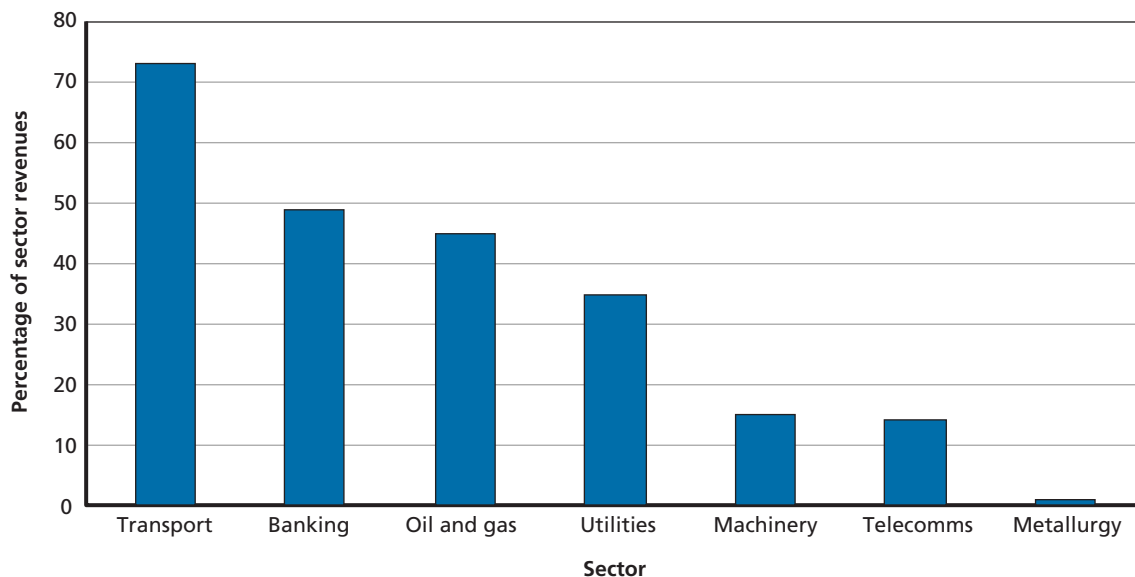
Renationalization and the creation of new SOEs have also been used as instruments of industrial policy to foster industries considered economically desirable.⁴⁹ Prime Minister Dmitri Medvedev has been on the forefront of policymakers pushing to use state funding and state entities to foster the growth of high-technology industries. His *Skolkovo* initiative, a high-technology industrial park being developed near Moscow, is one of his signature efforts.

However, the primary focus of efforts to create state-owned or -controlled national champions has been on industries considered strategic, such as defense, natural gas, and oil. Renationalization has been seen as a means of creating or supporting national champions in these sectors.

Ownership by Sector

Figure 3.8 shows the percentage of output in 2011 generated by companies owned or controlled by the Russian state by key sectors of the Russian economy. The transportation sector includes large state-owned or -controlled enterprises, such as Transneft, the state-owned oil pipeline company, Russian Railways, Aeroflot, and Gazprom's pipeline network. This sector was 73-percent state owned. With the partial exception of Gazprom, the state has always owned or controlled these companies, so renationalization has not been a major factor in this sector. In the oil sector, the share of state control or ownership rose from 10 percent in 1999 to between 40 and 45 percent by 2011, primarily due to the growth in Rosneft's assets, although state-owned Gazprom Neft, a subsidiary of Gazprom, also acquired some formerly privately owned assets. After Rosneft's acquisition of TNK-BP in 2013, the share of the state in the oil

Figure 3.8
Percentage of State-Controlled Assets in 2011, by Sector



SOURCE: Tsepliaeva and Eltsov, 2012, p. 2.

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⁴⁹ Kowalski, Büge, and Sztajerowska, 2013, pp. 11–13; Ken Warwick, “Beyond Industrial Policy: Emerging Issues and New Trends,” Paris: OECD Publishing, 2013, p. 20; Keith Crane and Artur Usanov, “Role of High-Technology Industries,” in Anders Åslund, Sergei Guriev, and Andrew Kuchins, eds., *Russia After the Global Economic Crisis*, Washington, D.C.: Peterson Institute of International Economics, May 2010.

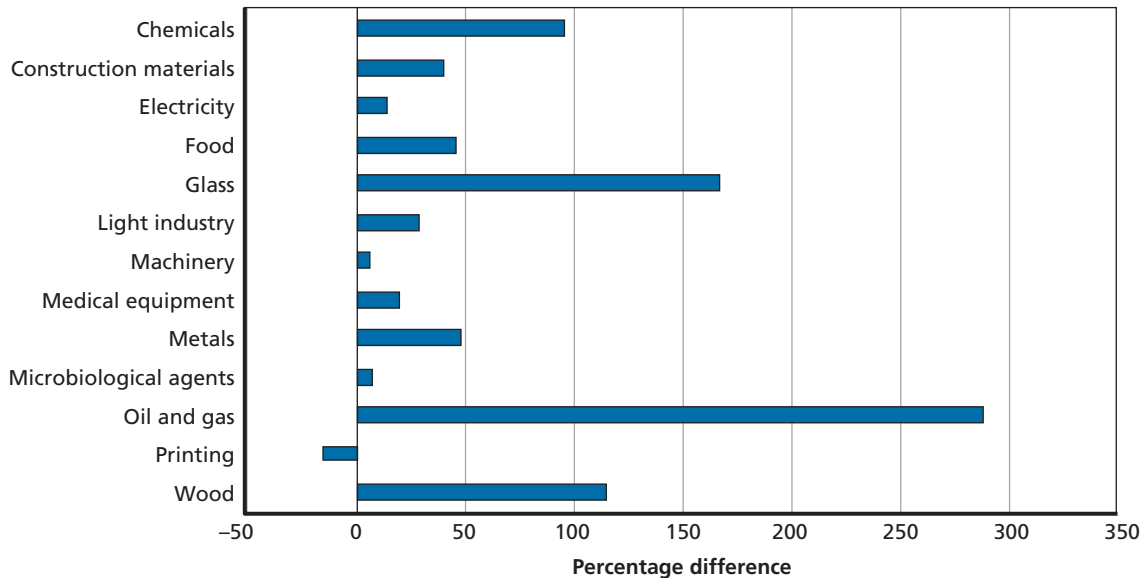
sector rose even further. As noted earlier, the state has reacquired a controlling interest in Gazprom, which produces most of Russia's gas, owns the distribution network, and has a monopoly over exports. The Russian state owns or controls 49 percent or more of the banking sector through its stakes in Sberbank, VTB, Gazprombank, and other state-controlled banks. This share rose after the 2009 recession due to the bankruptcies of a number of private banks and a partial retreat of European banks from the Russian market. The percentage of state ownership is lower in other sectors, such as machinery (15 percent), telecommunications (14 percent), and metallurgy (1 percent).

Outcomes

As noted earlier, SOEs are generally less efficient than privately owned firms. State-owned Russian enterprises are no exception. Figure 3.9 shows the differential in labor productivity between the state-owned and private sectors in 2000. With the exception of the printing industry, labor productivity in the private sector was appreciably higher than in the state-owned sector. This was especially noticeable in the oil and gas sector, where labor productivity was almost three times greater in privately owned oil companies than in Gazprom, Rosneft, and other SOEs. As reflected in its stock market valuation, labor productivity in Yukos, in particular, and Lukoil was much higher than in state-owned oil companies.

In contrast to these findings, Brown, Earle, and Gehlbach did not find improvements until recently in total factor productivity after privatization for former SOEs in Russia.⁵⁰ They estimated differences in total factor productivity between enterprises that have been privatized

Figure 3.9
Differences in Labor Productivity Between Private and State-Controlled Enterprises in 2000, by Industry



SOURCE: Tsepliaeva and Eltsov, 2012, p. 2.

RAND RR1468-3.9

⁵⁰ David Brown, John S. Earle, and Scott Gehlbach, "Privatization," Arlington, Va.: George Mason University School of Public Policy, Research Paper No. 2012-03, October 2011.

and those that have remained in state hands for Russia, Hungary, Romania, and Ukraine. For Russia, they used a data set containing all state-owned or former SOEs in manufacturing in Russia from 1985 to 2004, with an extension to 2005. In Hungary and Romania, the researchers found substantial, significant differences in total factor productivity (14 to 24 percent and 5 to 15 percent, respectively). In contrast, total factor productivity in privatized Russian firms was modestly lower than in enterprises that remained in state hands, at least initially. However, from 2003 through 2005, the difference in total factor productivity between SOEs and privatized SOEs became positive and widened, rising from 10 percent in 2003 to 30 percent in 2005, consistent with findings from Hungary and Romania.⁵¹

To provide a measure, albeit imperfect, of the effects of renationalization and other factors that have slowed economic growth in Russia, we estimated changes in the rate of growth in total factor productivity between 1999–2003, 2003–2008, and 2010–2014. We designated the first period as the one in which Russia's private sector was strongest, the second as one of rising renationalization, and the third as one characterized by much greater state ownership and control. To measure the various rates of growth in total factor productivity for these periods, we estimated the contributions to growth from labor and capital for each period using Russian data on total employment. We constructed our own series for Russia's capital stock, starting with the 2008 capital stock and adjusting this number by gross investment in fixed capital and depreciation. We chose to create our own series because, when we converted the nominal series for the value of Russia's capital stock into a constant price series using the Russian GDP deflator, we found the capital stock fluctuated from year to year in patterns inconsistent with trends in investment in constant price rubles. We weighted the data by the contributions of labor and capital to economic output using the share of wages and profits in GDP. We did not include taxes, the third category the Russian statistical authority uses in its breakdown of GDP by source of income, in this calculation. Usually, the third category is rents, not taxes. Because the Russian tax system levies taxes on wages, consumption, profits, and natural resource rents, we allocated taxes proportionally across labor and capital. We then assigned growth not generated by increases in employment or capital to increases in total factor productivity.

Table 3.5 shows the outcome of our analysis. The 2010–2014 period was marked by much slower growth in total factor productivity than either of the two previous periods. As noted earlier, the 2003–2008 period was marked by large increases in export prices for Russian oil and gas. It was also characterized by declines in real interest rates in Russia as the risk premium on medium-term investments in Russia fell. Thus, the rapid rates of growth in total factor productivity derived for this period incorporated these additional factors. However, oil and natural gas prices were still high during the 2010–2013 period. The sharp decline in growth in total factor productivity for this period is suggestive. The deceleration in the rate of growth was likely due at least in part to the less productive use of capital by renationalized state-owned or -controlled enterprises than when the assets were privately held, although other factors also played a role in this deceleration.

⁵¹ Brown, Earle, and Gehlbach, 2011, pp. 3, 10.

Table 3.5
Growth in Russian Total Factor Productivity Between 2000 and 2014

Period	Average Annual Rates of Growth (%)			In Total Factor Productivity
	In Labor	In Capital	In GDP	
2000–2003	0.6	–0.5	5.9	5.8
2000–2008	1.1	2.2	6.6	5.5
2003–2008	1.4	4.0	7.1	5.0
2010–2013	0.7	3.7	3.0	1.1
2010–2014	0.6	3.2	2.4	0.7

SOURCE: RAND calculations.

Corruption and the Business Environment

In this section, we first review the economic consequences of corruption and a poor business environment. Then, using a variety of data sources, we review trends in corruption and the business environment in Russia. We conclude with a discussion of the impact of corruption and the poor business environment on the Russian economy.

Defining Corruption

Corruption is the misuse of public office for private gain.⁵² For a specific country or locality, misuse of public office is usually defined by local laws and regulations. Broadly, corruption can be divided into two types. The first is *high-level corruption*. It occurs when senior policymakers alter or disregard laws and regulations in ways that favor specific parties in exchange for actions that serve their personal interests. Senior officials may take kickbacks or bribes associated with decisions concerning government procurement, sell government property at less than market value in exchange for bribes, make policy decisions that favor certain entities in exchange for personal compensation, or embezzle government funds. The second is *petty corruption*, paying lower-level civil servants to avoid regulatory penalties or taxes; expedite government procedures, such as obtaining building permits; or be granted preferential access to government services, such as admission to state-run universities at the expense of superior candidates.⁵³ Individuals and businesses may voluntarily offer to make payments so as to corrupt the civil servant, or the civil servant may demand payment in exchange for engaging in a beneficial action.

Economic Consequences of Corruption

Corruption increases the costs of doing business, adds to the costs of providing government services and making public investments, and may result in a government failing to take and enforce measures to correct impediments to the smooth functioning of markets or address

⁵² Jakob Svensson, “Eight Questions About Corruption,” *Journal of Economic Perspectives*, Vol. 19, No. 3, 2005, p. 20.

⁵³ Susan Rose-Ackerman, “The Political Economy of Corruption,” in Kimberly Ann Elliott, ed., *Corruption and the Global Economy*, Washington, D.C.: Peterson Institute for International Economics, 1997.

adverse social externalities stemming from private-sector activities.⁵⁴ Bribes and other kick-backs drive up the cost of public procurement, contracts, and government services. These and other costs of corruption reduce business activity, increase marginal tax rates, reduce the provision of public services and investment, diminish the viability of government projects, and discourage innovation.⁵⁵

Corruption results in the differential treatment of businesses. Preferential treatment may result in less-efficient producers taking market share from more-efficient producers. These effects can be seen empirically in terms of the “value of political connections” in numerous countries.⁵⁶ Faccio, for example, found that politically connected firms both borrow more and default more often, suggesting a clear distortion in lending to such firms and a corresponding reduction in the average rate of return to capital in the economy.⁵⁷ Corruption increases the cost of operating in a market and the rapidity with which one can start a business. These factors discourage new market entrants, reducing competition and lowering economic efficiency. These factors are especially challenging for small and medium-sized enterprises.⁵⁸ Shleifer and Vishny have shown that, in environments in which corruption is decentralized, as in Russia, businesses may need to bribe several authorities. In these environments, corruption is even more costly.⁵⁹

Corruption can impose constraints on firm growth, limiting increases in output because firms above a certain size become targets for predatory civil servants. In the case of Russia, the development of the software industry has been hampered by the extensive use of independent contractors to avoid paying payroll taxes and attracting the attention of the tax and regulatory authorities.⁶⁰

When corruption results in lower tax rates for firms that pay bribes than for those that do not, markets are distorted. The lost tax revenues have to be made up by other households and firms through additional taxes or higher tax rates, with all the associated losses in economic efficiency and output.⁶¹ Differential tax treatment stemming from corruption rewards the most

⁵⁴ See, for example, Olken and Pande’s overview of the effects of corruption on firm behavior. Benjamin A. Olken and Rohini Pande, “Corruption in Developing Countries,” *Annual Reviews, Annual Review of Economics*, Vol. 4, July 2012, p. 483.

⁵⁵ Olken and Pande, 2012, p. 483; Kevin M. Murphy, Andrei Shleifer, and Robert W. Vishny, “Why Is Rent-Seeking so Costly to Growth?” *American Economic Review*, Vol. 83, No. 3, 1993.

⁵⁶ Raymond Fisman, “Estimating the Value of Foreign Political Connections,” *American Economic Review*, Vol. 91, No. 4, September 2001; Asim Ijaz Khwaja and Atif Mian, “Do Lenders Favor Politically Connected Firms? Rent Provision in an Emerging Financial Market,” *Quarterly Journal of Economics*, Vol. 120, No. 4, November 2005; Mara Faccio, “Politically Connected Firms,” *American Economic Review*, Vol. 96, No. 1, March 2006.

⁵⁷ Faccio, 2006.

⁵⁸ OECD, *Russia: Modernising the Economy*, Paris: OECD Publishing, April 2013, pp. 13, 23; Brian Aitchison, *Small Business Collective Action and Its Effects on Administrative Modernization in Putin’s Russia: From “Grabbing Hand” to “Helping Hand”?* unpublished Ph.D. dissertation, London, UK: London School of Economics and Political Science, 2014.

⁵⁹ Andrei Shleifer and Robert W. Vishny, “Corruption,” *Quarterly Journal of Economics*, Vol. 108, No. 3, August 1993.

⁶⁰ Crane and Usanov, 2010.

⁶¹ Raymond Fisman and Shang-Jin Wei, “Tax Rates and Tax Evasion: Imports in China,” *Journal of Political Economy*, Vol. 112, No. 2, 2004.

effective briber, not the most efficient firm. Fisman and Svensson have shown that the effects of bribery are greater than the effects of higher taxes on slowing the growth of firms.⁶²

Cross-national studies of the effect of corruption on economic growth provide evidence that corruption negatively affects economic growth, but the evidence is not strong enough to make sweeping claims about average effects. Mauro found a statistically significant relationship between bureaucratic efficiency and the annual rate of growth in per capita GDP after controlling for other determinants of growth.⁶³ However, the macrolevel evidence on the relationship between corruption and growth is less robust than many other growth predictors. Mauro's study, for example, found that, after substituting a different measure of the corruption index, the relationship was only marginally significant.⁶⁴ Subsequent studies suggest that corruption's effects are likely to vary depending on the context. In addition, other variables, such as the quality of local political institutions may explain both observed levels of corruption and growth in per capita GDP. One study, which analyzed more country-years of data and used new indicators of corruption, did not find evidence of a statistically significant relationship.⁶⁵ As the author of that study noted, the weakness of the statistical evidence across the various studies could be the result of econometric problems inherent in analyzing cross-country data or could be because country-level data are too aggregated to detect the effects of corruption, especially if the effects differ across contexts.

During the period of rapid economic growth under Putin, some writers have argued that the brand of corruption—or “crony capitalism”—being practiced has induced discipline among bribe takers and reduced uncertainty among bribe payers.⁶⁶ Some economists argue that corruption might not impose large efficiency costs because it reduces transaction costs by “greasing” the bureaucratic wheels.⁶⁷ We do not find that to be the case because, in an environment in which civil servants are in a position to demand and receive bribes, they have incentives to increase the complexity of regulation, enhancing inducements to demand bribes.

Empirical Trends

Corruption

Russia has been plagued by corruption since the Tsarist era. In the post-Soviet period, the character of corruption has changed from circumventing the centrally mandated distribution of goods to practices more common in market economies. During the 1990s, well-connected individuals purchased oil and other commodities from SOEs at controlled prices and resold them at world market prices, pocketing the difference, and making very large sums of money.⁶⁸

⁶² Specifically, Fisman and Svensson showed that bribery is associated with lower growth among Ugandan firms (Raymond Fisman and Jakob Svensson, “Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence,” *Journal of Development Economics*, Vol. 83, No. 1, May 2007).

⁶³ Mauro, 1995.

⁶⁴ Mauro, 1995, p. 701.

⁶⁵ See Svensson, 2005, pp. 38–39. See also, for example, Toke Aidt, Jayasri Dutta, and Vania Sena, “Governance Regimes, Corruption and Growth: Theory and Evidence,” *Journal of Comparative Economics*, Vol. 36, No. 2, June 2008.

⁶⁶ For a variant of this argument, see Yegor Gaidar, *Collapse of an Empire: Lessons for Modern Russia*, Washington, D.C.: Brookings Institution, 2007.

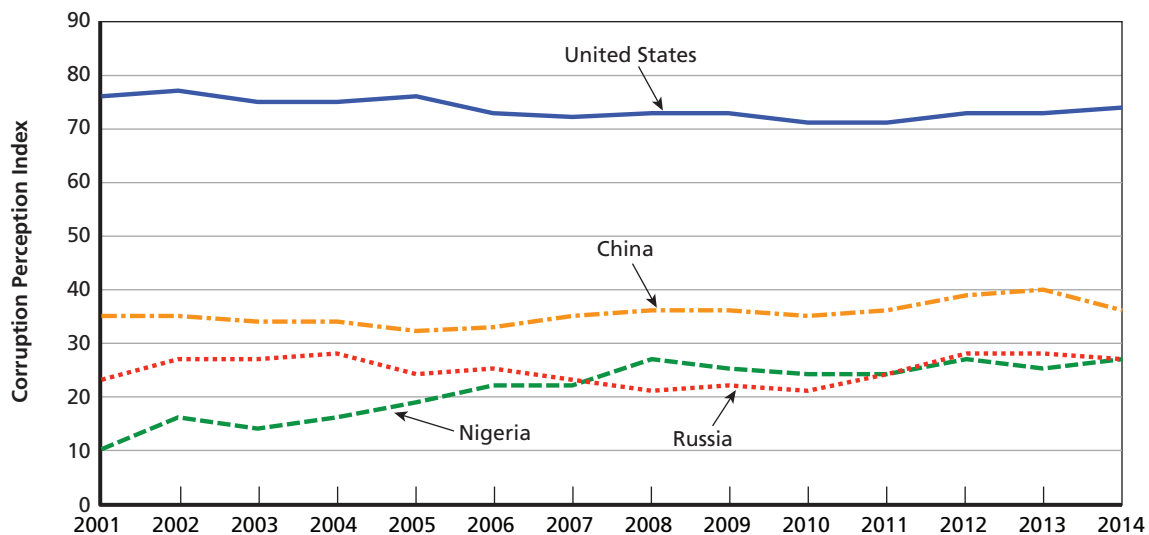
⁶⁷ Daniel Kaufmann and Shang-Jin Wei, “Does ‘Grease Money’ Speed Up the Wheels of Commerce?” Cambridge, Mass.: National Bureau of Economic Research, working paper No. 7093, April 1999.

⁶⁸ Åslund, 2007, p. 98.

Between 1995 and 1999, the most notable sources of corruption were associated with the sale of state-owned assets to favored individuals at less-than-market prices.⁶⁹ During this period, shareholders were sometimes defrauded of their holdings as thieves bribed civil servants in charge of share-holding registries to change the title to shares, shifting control to the thieves. Since then the integrity of Russian share registries has greatly improved, so this type of fraud has declined. Illegal transfers of profits into the pockets of managers and government officials have also declined as major companies, including those that are state-controlled, have been listed on international stock exchanges to increase their share prices. The audited accounts international exchanges demand provide incentives and controls that should reduce corruption within these companies.

Nonetheless, Russia ranks poorly on all major indices of corruption, both in absolute terms and relative to other countries. Transparency International has created a Corruption Perceptions Index under which a country that is perceived to have no corruption is given a rating of “100” and countries that are considered completely corrupt are given rating of “0.”⁷⁰ The index ranked Russia 121 out of 163 countries in 2006. Its position has not moved much since. Perceptions of corruption in Russia are higher than in all the OECD countries and even other BRICS members. Throughout the 2000s, corruption in Russia has been greater than in China; it is currently on par with Nigeria, which has noticeably improved since 2001, while Russia has not. (See Figure 3.10.)

Figure 3.10
Corruption Perception Index Ratings, 2001–2013



SOURCE: Transparency International, 2015.

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⁶⁹ Frye and Shleifer, 1997; Solnick, 1998; Volkov, 2002; Hoffman, 2003; Dawisha, 2014.

⁷⁰ Transparency International, “Corruption Perceptions Index,” website, 2015.

Other indices also show high levels of corruption in Russia.⁷¹ The World Bank publishes a Control of Corruption index in its World Governance Indicators database. This annual index estimates the likelihood of successfully countering red tape, corrupt officials, and other groups.⁷² Similar to Transparency International's Corruption Perceptions Index data, the World Bank corruption index shows that, in Russia, the ability to counter corruption was low throughout the 2000s and the early 2010s. Russia's control of corruption has been rated worse than China's since 2002, when the index was first compiled. Among countries with similar per capita GDPs measured using PPP exchange rates in 2014, Russia fared among the worst. Among European countries, Russia scored the worst, with the exception of Ukraine.

Business Environment

At the beginning of his third presidential term in 2012, Putin issued a presidential executive order decreeing that the federal government would greatly reduce the number of permits and other regulatory interventions that make it difficult for businesses to operate in Russia. One stated objective was to improve Russia's ranking on the World Bank's Ease of Doing Business list by 100 spots (from 120th to 20th) by the end of his six-year term in 2018.⁷³ In pursuit of this goal, the Russian government passed new laws to tighten standards for property registration and to reduce the red tape involved in starting new businesses after 2012.

Since Putin's decree, Russia has made significant progress. Its global ranking in the Ease of Doing Business list rose from 120th in 2012 to 112th in 2013 and 92nd in 2014 (out of 189 countries). Its ranking improved considerably again in 2015, when it moved up to number 62, and in 2016 it moved up again, to 51st place. Russia's improved ratings have been largely driven by three components of the Ease of Doing Business index: ease of registering property (12th in 2015), enforcement of contracts (14th in 2015), and ease of starting a business (34th in 2015, see Table 3.6).⁷⁴

This movement up the rankings should be treated with caution.⁷⁵ Categories in the index other than these three suggest that the business climate is less hospitable than in most developed countries. As of 2015, Russia ranked in the bottom tier in the difficulties businesses face in getting permits (156th), hooking up to electricity (143rd), and protecting minority share-

⁷¹ Many organizations produce a variety of estimates of corruption in Russia, some of which are published annually. These organizations include Transparency International, the World Bank, Freedom House, and the World Economic Forum.

⁷² The World Bank's full definition of *control of corruption* is that the variable "captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests" (World Bank, "Worldwide Governance Indicators," Web page, 2015b).

⁷³ Putin elaborated these objectives formally in a May 2012 order (Vladimir Putin, "Executive Order on Long-Term State Economic Policy," May 7, 2012).

⁷⁴ World Bank, *Doing Business 2012: Doing Business in a More Transparent World*, Washington, D.C., 2012; World Bank, *Doing Business 2013: Smarter Regulations for Small and Medium-Size Enterprises*, Washington, D.C., 2013a; World Bank, *Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises*, Washington, D.C., 2013b; World Bank, *Doing Business 2015: Going Beyond Efficiency*, Washington, D.C., 2014; World Bank, *Doing Business 2016: Measuring Regulatory Quality and Efficiency*, Washington, D.C., 2016a.

⁷⁵ Andrei Yakovlev, "Is There a 'New Deal' in State-Business Relations in Russia?" Institute for Economies in Transition, Bank of Finland, 2013, p. 11; Andrei Yakovlev, "Russian Modernization: Between the Need for New Players and the Fear of Losing Control of Rent Sources," *Journal of Eurasian Studies*, Vol. 5, No. 1, 2014.

Table 3.6
Indicators of the Ease of Doing Business in Russia, 2015

Indicator	Russia	World Average	Difference
Dealing with construction permits	156	95	-61
Enforcing contracts	14	94	80
Getting credit	61	89	28
Getting electricity	143	94	-49
Paying taxes	49	94	45
Protecting minority investors	100	93	-7
Rank	62	94	32
Registering property	12	95	83
Resolving insolvency	65	95	30
Starting a business	34	94	60
Trading across borders	155	94	-61
Overall average	77	94	16

SOURCE: World Bank, 2014.

holders (100th). According to a 2014 World Economic Forum survey of 144 countries, Russia ranked 120th in the protection of property rights.⁷⁶

Moreover, the Ease of Doing Business methodology has a major weakness. It does not account for corruption or poor enforcement of laws and regulations; it measures only enacted laws and regulations.⁷⁷ A wide gulf exists between the laws and regulations and the enforcements and informal norms that govern commercial activity in Russia. Not accounting for these factors leads to an overly rosy assessment of measurements of the business climate.⁷⁸

Corruption, the Business Environment, and Economic Outcomes

McFaul and Stoner-Weiss have argued that “any causal relationship between authoritarianism and economic growth in Russia (under Putin) . . . is negative.”⁷⁹ They argued that Russia’s shift to an “autocratic” system has engendered more corruption and less-secure property rights, which slow economic growth. However, determining the causal relationship between

⁷⁶ World Economic Forum, “The Global Competitiveness Report, 2014–2015,” 2014; OECD, “OECD Economic Surveys: Russian Federation 2013,” Paris: OECD Publishing, January 2014, pp. 25–28.

⁷⁷ According to Isaac Stone Fish, “Someone Tell the World Bank About Corruption in Russia,” *Foreign Policy*, October 29, 2013, the lead author of the 2013 “Doing Business” report, Rita Ramalho, reported that her research team did not measure corruption because it sought to “measure a ‘policy’ variable, rather than an ‘outcome’ variable.” The survey thus measures the time various tasks *should* take under a country’s laws, not how long they *actually* take in the presence of informal corruption.

⁷⁸ Alena Ledeva, *How Russia Really Works: The Informal Practices that Shaped Post-Soviet Politics and Business*, Ithaca, N.Y.: Cornell University Press, 2006; Volkov, 2002; Joris Van Bladel, “The Dual Structure and Mentality of Vladimir Putin’s Power Coalition,” Stockholm: FOI, 2008.

⁷⁹ Michael McFaul and Kathryn Stoner-Weiss, “The Myth of the Authoritarian Model: How Putin’s Crackdown Holds Russia Back,” *Foreign Affairs*, Vol. 87, No. 1, January/February 2008.

corruption, the quality of the business environment, and economic growth in Russia is difficult because of confounding factors, such as the problems in Russia's financial sector that triggered the 2009 recession and the recent fall in world market oil prices.

Rosstat provides the lowest estimate of the cost of corruption to the Russian economy. It reported in 2011 that corruption absorbed 3.5 percent of Russia's GDP.⁸⁰ One group of independent Russian experts estimated that corruption ran roughly 25 percent of GDP.⁸¹ A separate report, published in 2010 by the Russian think tank INDEM, estimated that the cost of corruption in Russia amounted to some "\$300–\$500 billion" out of a GDP of roughly \$1.5 trillion—meaning that as much as one-third of Russia's GDP was lost to corruption.⁸²

Statistics from the Russian Ministry of the Interior's Department for Combating Economic Crimes indicate that, after accounting for inflation, the average bribe in 2011 was 26 times greater than the average bribe in 2008, a phenomenal increase in such a short time.⁸³ The average bribe continued to increase in 2015.⁸⁴ Construction costs in Russia are unusually high compared to the costs of similar projects in other countries. Russia reportedly spent over three times more per kilometer of road constructed than did neighboring Finland.⁸⁵ Russia reportedly spent \$51 billion on the 2014 Sochi Winter Olympics, while Canada spent \$8 billion on the 2010 Vancouver Winter Olympics.⁸⁶ The average cost of public works projects in Russia is the highest in Europe.

Corruption is detrimental to attracting investment, especially foreign investors. A 2013 Ernst & Young survey on Russia found that only 6 percent of potential foreign investors would consider embarking on a project in Russia; 74 percent of the survey's respondents said they were cautious about investing in Russia due to "a perception of pervasive corruption, lack of openness, and inefficient rule of law."⁸⁷

Using these figures and estimates to calculate the effect of corruption on aggregate GDP or rates of economic growth is difficult. In many instances, it appears that the analysts are comparing GDP with estimates of gross flows of payments associated with corruption. GDP nets out gross flows to calculate value added; comparing a gross flow to value added is not the same as estimating the effects of that flow on value added.

⁸⁰ The Rosstat estimates included unreported salaries (as a means of avoiding taxes and other social payments), as well as other types of tax evasion. See Alexandra Kalinina, "Corruption in Russia as a Business," Institute of Modern Russia website, January 29, 2013.

⁸¹ V. Milov, B. Nemtsov, V. Ryzhkov, and O. Shorina, eds., "Putin. Corruption," an independent white paper, trans. Dave Essel, Moscow: Partiya Narodnoi Svobody, 2011.

⁸² David J. Kramer, "Russia 2012: Increased Repression, Rampant Corruption, Assisting Rogue Regimes," testimony presented before the Committee on Foreign Affairs, U.S. House of Representatives, March 21, 2012.

⁸³ Kalinina, 2013.

⁸⁴ In 2008, the average bribe was 9,000 rubles; 23,000 rubles in 2009; 61,000 rubles in 2010; and 236,000 rubles in 2011 (Kalinina, 2013). As of early 2015, the average bribe was 327,000 rubles (\$5,300 at February 2015 exchange rates)—roughly 67 percent of GDP per capita the previous year based on World Bank data. See Ivana Kottasova, "Ruble Collapse Makes Bribery More Expensive for Russians," CNN Money, February 27, 2015.

⁸⁵ Kalinina, 2013.

⁸⁶ Owen Gibson, "Sochi 2014: the Costliest Olympics yet but Where Has All the Money Gone?" *The Guardian*, October 9, 2013.

⁸⁷ However, 68 percent of respondents who were existing investors in Russia said they "planned to scale up their presence in Russia." See Ernst & Young, "Russia 2013: Shaping Russia's Future," Attractiveness Survey, 2013, p. 28.

We attempted to estimate the effects of corruption in Russia on rates of economic growth by comparing how much more rapidly Russia might have grown if corruption had been significantly lower. All the European transition economies that have become members of the European Union have reduced corruption and improved governmental efficiency. For example, as late as 2002, Romania was ranked even lower than Russia in Transparency International's Corruption Perceptions Index. Since 2006, it has ranked very considerably higher.

In this exercise, we assumed that Russia could have replicated Romania's experience. Romania is one of the transition countries that has had some of the greatest difficulties with corruption. We employed two separate approaches, drawing on Mauro: one extrapolating from the plausible effects of corruption on levels of investment and the second using Mauro's estimated relationships between corruption and economic growth, substituting Transparency International's Corruption Perceptions Index for the corruption index from Business International that Mauro used. Under the first approach, using Mauro's coefficients for the effect of corruption on levels of investment, we estimated how much more Russia might have invested if it had been able to reduce corruption from its actual level in 2013 of 28 to Romania's level, which was 43, for the entire 2000–2014 period.⁸⁸ Using Mauro's estimated coefficients, the share of investment in GDP in Russia would have been 1.8 percentage points higher if corruption in Russia had been at Romania's levels in 2013. We then estimated the effects of more investment on economic growth. In our calculations of total factor productivity growth in Russia, factoring out growth in total factor productivity, we ascribed 41.7 percent of output growth to capital and 58.3 percent to labor. Using 41.7 percent, the additional capital generated by the higher share of investment in total output between 2000 and 2014 would have resulted in Russian GDP being 4.2 percent higher in 2014 than it actually was. GDP would thus have grown 0.3 percent per year more rapidly if corruption had been lower.

In the second approach, we used Mauro's estimates of the relationship between corruption and the rate of growth in per capita GDP. Mauro found that, for a 2.5-point improvement on his ten-point corruption index, the rate of growth in per capita GDP would rise by 0.8 percentage point.⁸⁹ If Russia were to replicate Romania's performance, it would have enjoyed a 1.5-point improvement on the Transparency International corruption index (converted from a 100- to a 10-point scale). This would be equivalent to an annual increase in the rate of growth in per capita GDP of 0.5 percentage point. Russia's population has been falling, however. Converting this improvement in growth in per capita GDP into GDP for 2000–2014, Russia would have generated an additional increment to GDP in 2014 of 3.8 percentage points or an additional average annual increase of 0.3 percentage point of GDP. So, using either technique, if Russia would have been able to reduce corruption to Romanian levels between 2000 and 2014, its economy might have grown 0.3 percentage point faster on an annual basis.

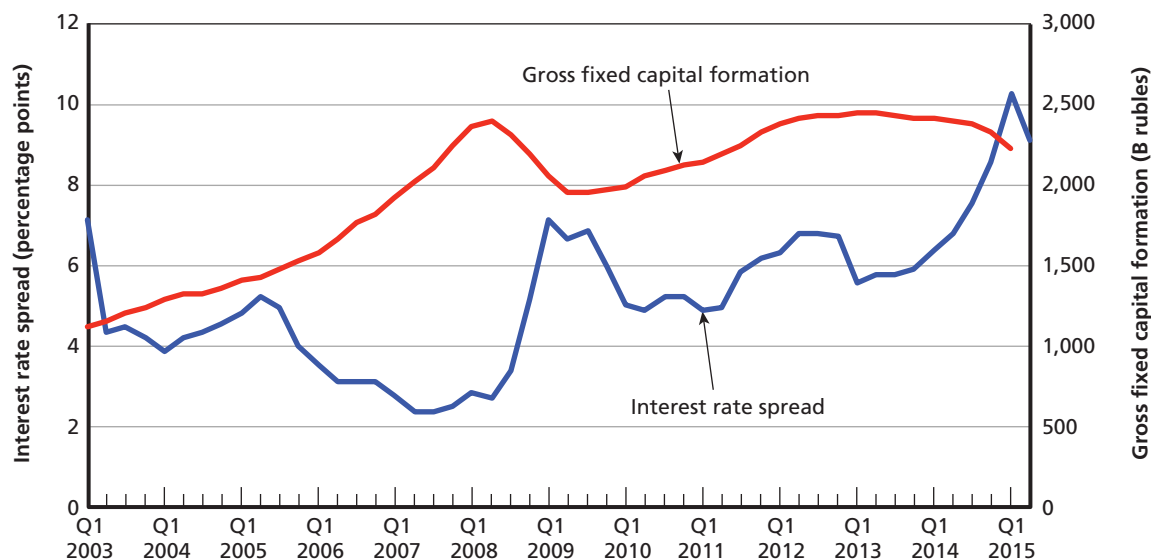
Increases in Real Interest Rates

Between the third quarter of 2013 and the first quarter of 2015, the Russian government suffered a 4.4-percentage-point increase in spreads between sovereign Russian euro bonds and German *bunds* (Figure 3.11). The cost of capital for the Russian government rose 75 percent

⁸⁸ Mauro, 1995, p. 696; Transparency International, 2015.

⁸⁹ Mauro, 1995, pp. 701, 703.

Figure 3.11
Spreads Between Russian Euro Bonds and German Bonds and Total Investment in Fixed Capital in Constant Price Rubles



SOURCES: Interest rate spread calculated as the difference between interest rate for 10-year German government bonds minus interest rate for 10-year Russian government bonds, as reported by OECD, "Interest Rates: Long-Term Interest Rates," Web page, 2015. Investment data (in billions of constant 2008 rubles) are from Rosstat, various years a.

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from 5.8 to 10.2 percent. Nonsovereign Russian borrowers experienced even more dramatic increases in interest rates.

The increase in interest rate spreads did not begin in 2014, however. Russia enjoyed its lowest spreads in 2007 (2.4 percentage points) before the meltdown in global financial markets in 2008. Spreads rose sharply in 2008, following the meltdown, and in 2009, during the Russian recession and the previous period of low oil prices. However, even after the end of the recession, Russian spreads remained 2.5 to 4.0 percentage points higher than in 2006 and 2007.

A number of factors led to the increase in interest rate spreads in 2014 and 2015: the decline in Russia's terms of trade, which increased credit risks associated with Russian government liabilities and those of Russian energy companies because of lower dollar revenues from oil and natural gas; the fall in the ruble exchange rate, which affected the creditworthiness of Russian borrowers with substantial revenues in rubles and liabilities in foreign currencies; and international financial sanctions. Investor concerns about Putin's economic policies, especially renationalization risk, and about corruption and the business environment also contributed to these higher spreads. We next discuss the various factors that have elevated Russian spreads.

Sanctions

In March 2014, the United States, the European Union, Canada, Norway, and other countries imposed sanctions on Russians tied to Russia's takeover and annexation of Crimea and on a few Russian financial institutions and companies closely affiliated with Putin or these individuals. The sanctioning countries denied visas and access to financial services and institutions. In response to Russia's intervention in eastern Ukraine in 2014, sanctioning countries expanded

the list of sanctioned Russian individuals, this time to individuals tied to the intervention and to selected state-owned banks and companies. State-owned energy companies were denied access to specialized technologies for the extraction of oil and natural gas.

The World Bank has attempted to measure the likely effects of sanctions on Russia's economy. It has argued that, in addition to reduced access to international financial markets (a reduction in the supply of credit), sanctions increase domestic costs of capital because of greater risks of exchange rate volatility and inflation and declines in domestic investor and consumer confidence, which depress both consumption and investment.⁹⁰ The World Bank also reviewed the effects of sanctions on other economies that have been subject to sanctions, focusing on South Africa during apartheid. In South Africa, the study found that, "Fixed domestic investment fell from 26 percent of GDP in 1980–1985 to 19 percent in 1986–1990. The annual rate of growth in capital stock slowed from 4 percent in the early 1980s to 1 percent after 1985, and capital stock actually fell in agriculture, manufacturing, and construction."⁹¹

In an effort to untangle the effects of sanctions on interest rate spreads between sovereign Russian debt compared to German *bunds* from the effects of the decline in oil prices, we compared spreads in the fourth quarter of 2013 (before sanctions were imposed) and the second quarter of 2014 (after sanctions were imposed, but before oil prices had fallen sharply). The spread widened by 0.9 percentage point from 5.9 percentage points in the fourth quarter of 2013 to 6.8 percentage points in the second quarter of 2014 (Figure 3.11). We also looked at changes in gross fixed capital investment. Russia has suffered even more severe changes in investment since the imposition of sanctions than South Africa had, posting declines in 2014 and 2015 (Figure 3.11). In the following, we estimate the potential economic costs of these effects.

Renationalization, Corruption, and the Business Environment and Real Interest Rates

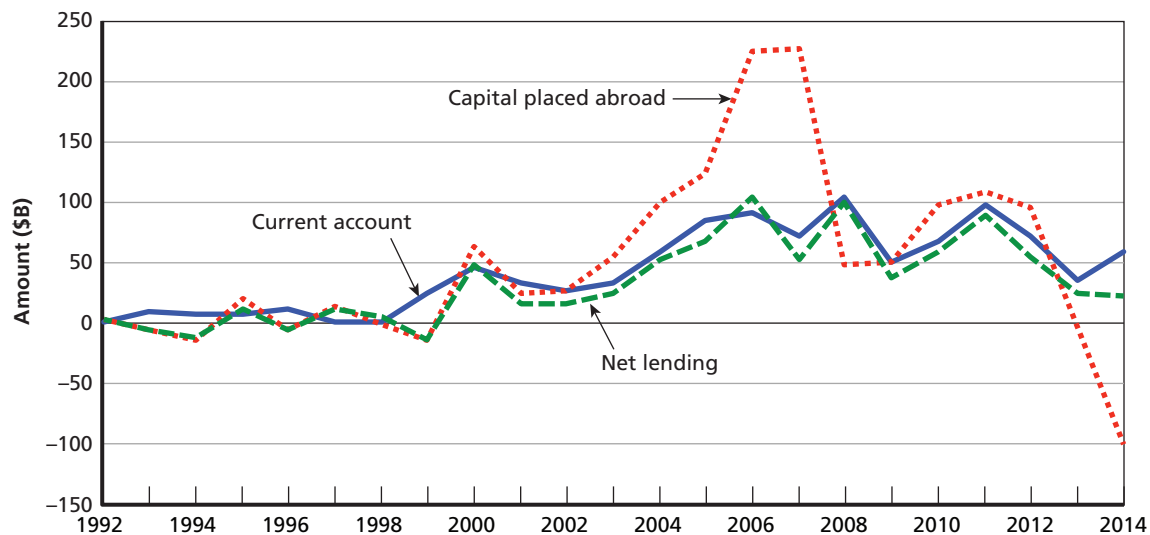
Except for two years (1992 and 1997), Russia has run current account surpluses ever since it emerged from the former Soviet Union, making the country a net saver; foreign earnings and transfers abroad have exceeded purchases of goods and services and transfers from abroad (Figure 3.12). These current account surpluses are a reflection of the preferences of Russian households and businesses to park significant shares of their savings abroad, reflecting their unease about the security of investments in Russia. Increases in oil and natural gas prices and greater export volumes were also an important factor in exports of capital. They made possible the large additions to foreign currency reserves between 2002 and 2007. Increases in reserves and Russian investments abroad led to positive net exports of capital between 2000 and 2012; at the height of Russia's boom (2003–2007), net exports of capital ran 13 to 23 percent of GDP.

During the boom years, on a gross basis, Russia also enjoyed large capital inflows. In the energy sector, foreign banks financed the costs of exploration and new production of Russian oil and gas. Large Russian metal and mineral companies also borrowed to expand their operations. However, most lending went to Russian banks, which lent these funds on to Russian businesses and consumers. Russian developers borrowed heavily to develop new residential and commercial complexes. Russian consumers borrowed to purchase cars and buy and renovate

⁹⁰ World Bank, 2015a, pp. 38–39.

⁹¹ World Bank, 2015a, p. 36.

Figure 3.12
Capital and Financial Accounts, 1992–2014



SOURCES: Macroeconomic data from CBR, undated; current account for 1992–1999 from IMF, undated.

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their homes. Access to household credit has been an important factor contributing to the creation of a Russian middle class.

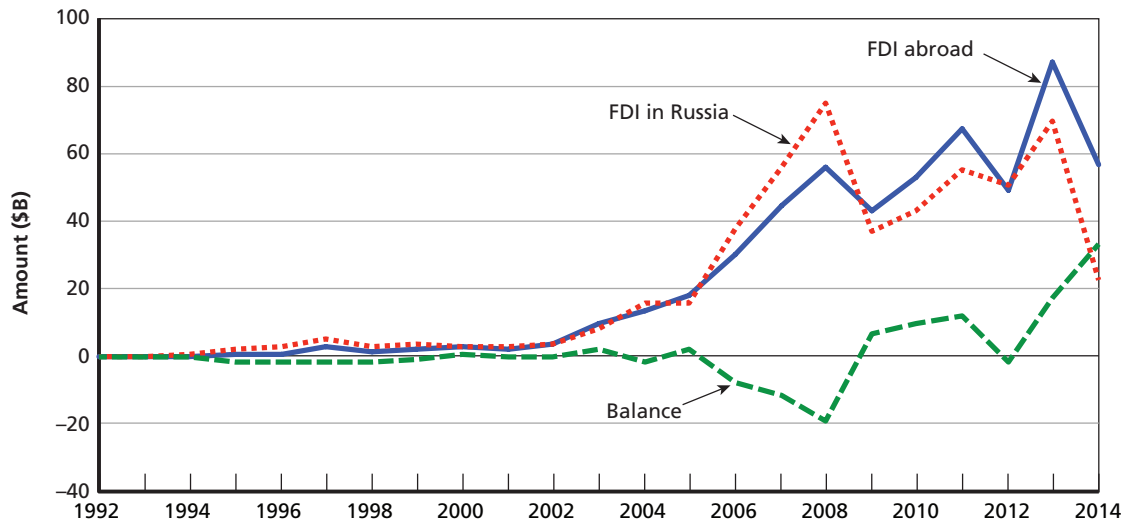
Russia enjoyed a substantial influx of FDI from 2003 through 2014 (Figure 3.13). However, inflows of FDI, albeit at much smaller volumes, began early in the post-Soviet transition. FDI played an important role in moving the Russian economy from central planning to markets. Foreign investors introduced Russians to management practices used in market economies and brought in new technologies.

As the Russian economy grew, Russian investors and companies began to invest part of their new wealth abroad, purchasing foreign companies and physical assets, especially property. By 2005, Russian FDI abroad exceeded \$17 billion annually. FDI continued to rise through 2013, when it hit \$87 billion. Inflows of FDI generally exceeded outflows during the boom years, reaching \$75 billion in 2008, \$19 billion more than Russian investment abroad. However, inflows fell after 2008. Since 2009, Russians have invested more abroad than foreign investors have in Russia.

Some of the incoming FDI involves round-tripping: Russians who have moved assets abroad use foreign shell companies to invest back into Russia. Tax havens, such as Bermuda, the British Virgin Islands, Cyprus, and Gibraltar, were sources of one-third of foreign investment into Russia between 2007 and 2014. In 2008, they accounted for one-half of all inward FDI.

It is difficult to disentangle the roles of renationalization, corruption, the business environment, and Putin's policies on incoming FDI through 2013. Putin's policies and the ensuing sanctions appeared to have led to a sharp decline in FDI in 2014, which continued into 2015. But the shift from a net inflow to a net outflow of FDI since 2009 suggests that, once Russia went into recession, the less-attractive business and policy environment trumped the attractions of the recovering Russian economy for both foreign and domestic investors, reducing the supply of capital available for investment within Russia.

Figure 3.13
Flows of Foreign Direct Investment into and out of Russia, 1992–2014



SOURCES: CBR, undated; IMF, undated.

NOTE: A positive balance means that Russian entrepreneurs invested more in equities and fixed assets abroad than foreign companies and entrepreneurs directly invested in Russia.

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During periods of rapid growth, countries invest higher shares of GDP in gross fixed capital. For example, the East Asian Tigers invested well over 30 percent of GDP during their boom years. Between 2000 and 2014, on average, Russia invested 20.0 percent of GDP in gross fixed capital. Over the same time period, capital exports averaged 10.4 percent of GDP. If the capital that was exported had been invested in Russia, the investment-to-GDP ratio would be at the levels of East Asian countries during their periods of rapid growth. Based on these figures, if the investment climate in Russia were better, Russia should have the resources to invest 30 percent of GDP in gross fixed capital. Provided the funds were invested efficiently, they would provide a substantial impetus to growth.

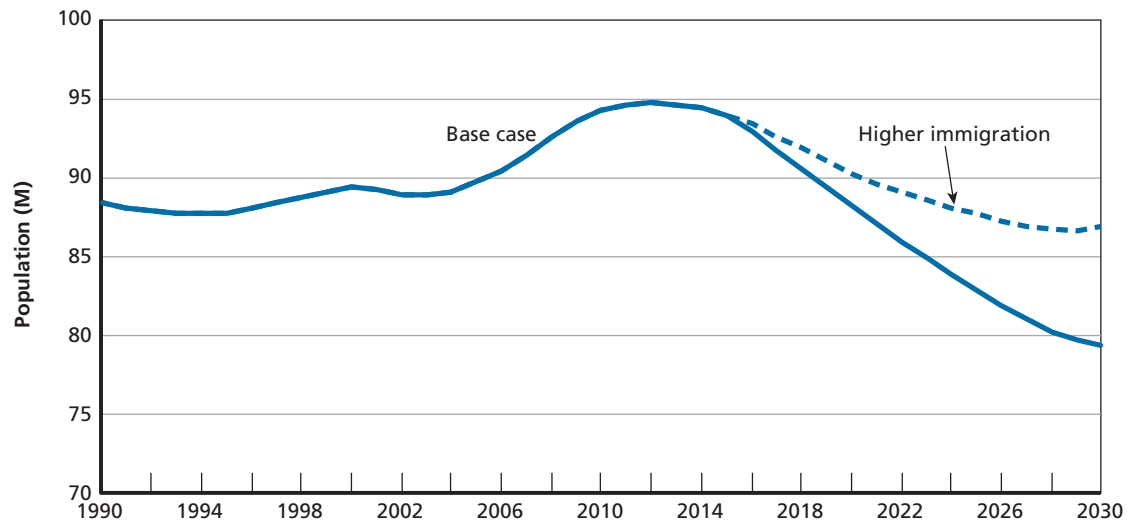
Declining Labor Force

Demographic Trends

In many countries in Europe and East Asia births have been below population replacement rates for decades. Russia is a member of this group. Although the birth rate dropped below replacement prior to the dissolution of the Soviet Union, the rate fell even more sharply during the transition, as it had in other transition economies. The cohorts from the “birth bust” of the early 1990s have been entering the labor force since 2010. They are too small to replace those retiring or otherwise exiting the labor force. As a consequence (Figure 3.14), Russia’s labor force is entering a decade of sharp declines. The medium variant of the United Nations’ (UN’s) population projections for Russia shows the labor force falling from 95 million in 2012 to 83 million in 2025, a 12-percent reduction.

A number of other factors are reducing the size of Russia’s labor force. Male life expectancy is low because of premature deaths stemming from alcohol, smoking, and accidents.

Figure 3.14
Working-Age Russians (20 to 65) from 1990–2030 Under the UN's Medium Forecast and RAND's Higher Immigration Forecast



SOURCES: Authors' calculations based on projected numbers of working age adults from United Nations, Department of Economic and Social Affairs, Population Division, "File POP/1-1: Total Population (Both Sexes Combined) by Major Area, Region and Country, Annually for 1950–2100 (thousands)," spreadsheet, July 2015. Higher immigration data are from RAND projections as described in text.

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Consequently, the number of male workers in their 60s is much lower than in other countries with similar per capita incomes and educational attainments. Retirement ages (60 for men, 55 for women) are lower than in other countries with similar employment patterns and levels of education. Consequently, labor force participation rates in these age brackets are far below those in similar countries, especially for women, reducing the overall supply of labor.

The Role of Immigration

Russia's population has been declining since 1993, but large inflows of immigrants have prevented it from falling more rapidly. During the 1990s, large numbers of ethnic Russians, as well as other ethnic groups, immigrated to Russia from the other former Soviet republics, contributing to steeper population declines in Armenia, Georgia, Kazakhstan, and Ukraine. Even in the 1990s, employment prospects and personal incomes in Russia were better than in the other former Soviet republics. The economic boom of the last decade attracted large numbers of immigrant workers from Central Asia and the Caucasus, as well as from Ukraine and Belarus. Temporary migrant workers from former Soviet countries have helped alleviate labor shortages in Russia.

In addition to the influx of people in the 1990s, Russia also experienced outflows. Between 1990 and 1992, more than 2 million Russian nationals emigrated, primarily to other former Soviet republics but also to the United States, Western Europe, and Israel. After this initial surge, a steady stream of Russians continued to emigrate, topping 200,000 annually. By 2014, more than 11 million Russian nationals were living abroad—compared with a domestic population of about 142 million, equivalent to 7 percent of the combined populations of Russian

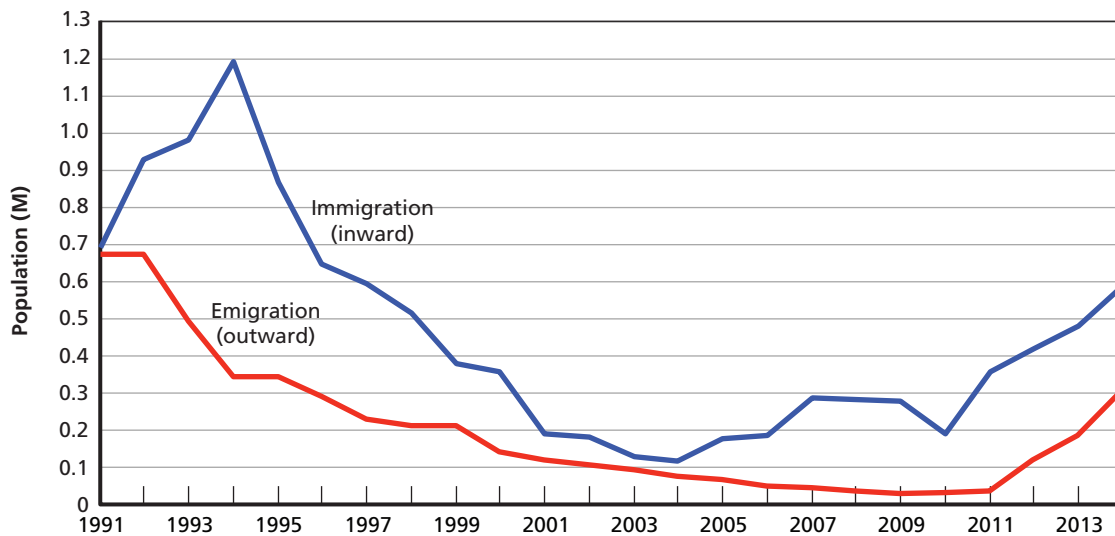
citizens living within and outside the country.⁹² More than 80 percent of these emigrants relocated to CIS countries.⁹³

Nonetheless, Russia has attracted more immigrants than it has lost since the collapse of the Soviet Union (Figure 3.15). More than 11 million migrants, primarily from the former Soviet republics, are currently living in Russia—slightly more than the number of Russian nationals who are living abroad.⁹⁴ Even in 2014, Russia accepted more than 590,000 new immigrants, nearly double the number of Russian nationals who emigrated in that year. Ninety percent of the new arrivals were from other former Soviet republics, especially Ukraine and Uzbekistan (Table 3.7).

The future size of Russia's labor force will depend heavily on rates of net immigration. In early 2015, immigration rates into Russia were reportedly down by 70 percent due to reductions in real wages for low-skilled immigrants stemming from higher inflation, recession, and the decline in the dollar value of wages because of the fall in the value of the ruble.⁹⁵ If this trend continues, the size of Russia's labor force will tumble, as shown in Figure 3.14.

The base forecast in Figure 3.14 assumes that annual net inflows of people to Russia will fall from almost 300,000 in 2013 and 2014 to 180,000 between 2015 and 2020 and to 60,000 between 2020 and 2030. If, instead, net inflows return to their levels of 2013 and 2014, the

Figure 3.15
Russian Emigration and Immigration, 1991–2014



SOURCE: Rosstat, 2014.

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⁹² In contrast, about 14 percent of the United States' total population is from abroad. UN, *Trends in International Migrant Stock: The 2013 Revision*, Department of Economic and Social Affairs, Population Division, 2013; Central Intelligence Agency, *World Factbook*, 2014.

⁹³ Rosstat, "Indicators of International Migration," Moscow, 2014.

⁹⁴ UN, 2013.

⁹⁵ Andrei Kolesnikov, "The Russian Middle Class in a Besieged Fortress," Carnegie Moscow Center, Carnegie Endowment for International Peace, April 6, 2015; Mark Adomanis, "Immigration into Russia Is on Pace to Fall by 10%," *Forbes*, January 2, 2015.

Table 3.7
Migration to and from Russia by Country (2013–2014)

	Emigration Flows by Destination		Immigration Flows by Origin		Net Migration Flow (inflow – outflow)	
	2013	2014 ^a	2013	2014 ^a	2013	2014 ^a
CIS countries	147,853	259,211	422,738	529,437	274,885	270,226
Armenia	10,182	22,561	42,361	46,567	32,179	24,006
Kazakhstan	11,802	18,328	51,958	59,142	40,156	40,814
Tajikistan	17,362	35,296	51,011	54,657	33,649	19,361
Uzbekistan	50,864	94,179	118,130	131,269	67,266	37,090
Ukraine	18,626	32,448	55,037	126,820	36,411	94,372
Non-CIS countries	38,529	51,285	59,503	61,380	20,974	10,095
Total	186,382	310,496	482,241	590,817	295,859	280,321

SOURCE: Rosstat, 2014.

^a Only preliminary data are available for 2014. Includes data from Crimea.

decline in the working-age population will be 9 percent, rather than 12 percent. Although this appears small in percentage terms, the working-age population would be roughly 2 million people greater than in the medium projection.

Russia has not been overly hospitable to immigrants, especially from Central Asia. Poorly controlled borders; a culture of corruption that allows employment of illegal immigrants; large disparities in per capita incomes between Russia and Central Asia; indigenous legal populations of people of the same ethnicity; and Russian language skills, especially among Belarussians and Ukrainians, facilitate inflows of migrants. The Eurasian Economic Union provides visa-free access to Russia to citizens of member states, which, for example, gives temporary migrant workers from Kyrgyzstan an advantage over those from Tajikistan. These factors suggest that continued substantial net inflows of immigrants and temporary migrant labor are likely, offsetting to some extent the effects of the shrinking population of Russian citizens.

Brain Drain?

In 2014, the number of Russian emigrants topped 300,000 for the first time since the early 1990s.⁹⁶ Some emigrants have left after receiving threats from Russia's security forces or individuals associated with the regime, products of the increasingly repressive political environment since Putin's election to a third presidential term in early 2012.⁹⁷ Growing uncertainty connected with fallout from Russia's intervention in Ukraine, Russia's poor business climate,

⁹⁶ Some experts claim these numbers are very low. For instance, they do not include Russians who live abroad for, say, nine months of the year but maintain an apartment in Moscow in which they reside for a few months of the year (Rosstat, 2014). On the quality of Rosstat data, see, for instance, Mark Adomanis, "The Myth of Russia's Brain Drain," *Forbes*, February 27, 2013.

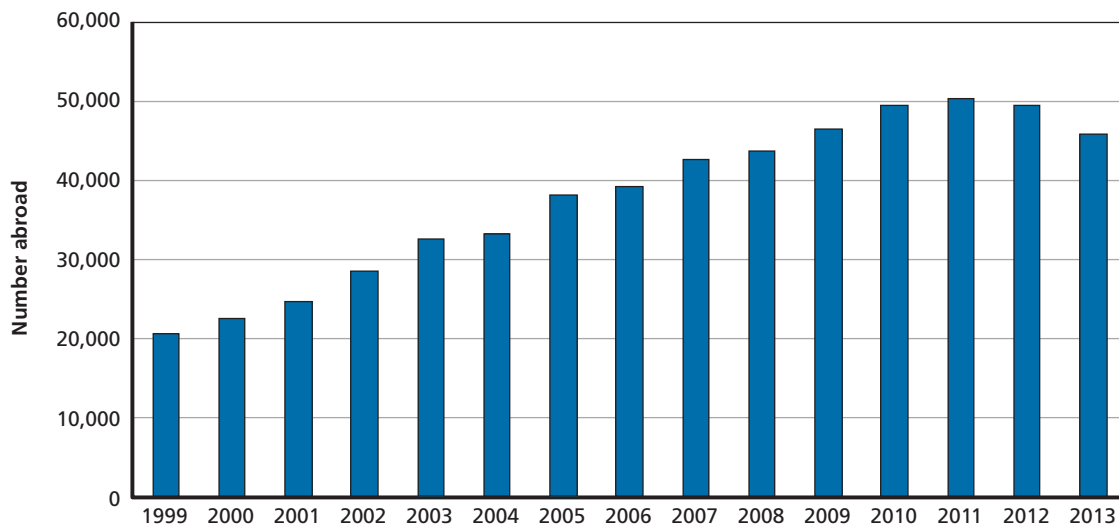
⁹⁷ According to public opinion tracking conducted by the independent, Moscow-based Levada Centre, the number of Russians wanting to leave the country increased from 13 percent in 2009 to 22 percent in 2011–2013, following Putin's election to a third presidential term (Alissa de Carbonnel, "Russia's Smartest People are Leaving in Doves," *Business Insider*, July 24, 2014).

the prevalence of corruption and graft, and poor economic prospects have contributed to this outflow.

Many emigrants are entrepreneurs, professionals, and intellectuals—valuable human capital.⁹⁸ According to a report by the Heritage Foundation, the share of Russian emigrants who have some education from a university or technical college is three times their share in the general population.⁹⁹ While the current exodus is still far below the numbers of Russian emigrants between 1990 and 1992, the loss of human capital is detrimental to the Russian economy.¹⁰⁰ Although more people are still immigrating to Russia than are emigrating, the average educational attainments of immigrants, especially those from the Caucasus and Central Asia, are far less than those of Russians who have emigrated.¹⁰¹

In addition to the loss of Russian professionals, large numbers of young Russians are studying abroad at foreign universities and other institutions of higher education. Numbers have roughly doubled since the late 1990s (Figure 3.16). In 2013, the most recent year for which official statistics are available, approximately 46,000 Russians of college age were studying at institutions of higher education abroad. This number is equal to about 4 percent of the 1.2 million students studying at higher educational institutions in Russia, or about 0.4 per-

Figure 3.16
Number of Russian Students Studying at Universities and Other Tertiary Educational Institutions Abroad, 1999–2013



SOURCE: UN Educational, Scientific and Cultural Organization (UNESCO), Institute for Statistics website, 2013.

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⁹⁸ Khristina Narizhnaya, “Russians Go West,” *World Policy Journal*, Vol. 30, No. 1, Spring 2013; Jason Corcoran, Jake Rudnitsky, and Serena Saitto, “Russia Brain Drain Saps Talent as Sanctions Hit Financing,” *Bloomberg Business*, October 26, 2014; Elena Holodny, “Russia’s Brain Drain is Astounding,” *Business Insider*, December 2, 2014.

⁹⁹ Ariel Cohen, Ivan Benovic, and James Roberts, “Russia’s Avoidable Economic Decline,” Washington, D.C.: Heritage Foundation, Special Report 154, September 17, 2014.

¹⁰⁰ Dan Bloom, “Putin’s Great Russian Brain-Drain: Number of Professionals Quitting Country Soars Amid Crimea and Ukraine Crisis,” *Daily Mail*, December 2, 2014.

¹⁰¹ Mary Elizabeth Malinkin, “Russia: The World’s Second-Largest Immigration Haven,” *National Interest*, August 10, 2014; Adomanis, 2015.

cent of the national population of 10.5 million Russians of university or postsecondary school age.¹⁰² The top destinations for these students were Germany, the United States, France, and the United Kingdom. These figures do not include children of the Russian elite permanently living abroad.

Russia hosts foreign students at its own universities and other institutions of higher learning. In 2014, Russia accepted about 206,000 tertiary-level students from abroad.¹⁰³

Some, but not all, Russian students remain abroad after completing their degrees. According to two recent surveys, 45 percent of Russian college students want to emigrate permanently, and 37 percent of Russian middle-class parents hope their children will move abroad.¹⁰⁴

In addition to Russians who have emigrated, the number of foreigners from countries other than the CIS working in Russia, especially professionals, has fallen sharply due to the recession and the deterioration in relations between Russia and the West. The number of foreigners with official permission to live in Russia fell to 417,000 people in 2014, down by 4.7 percent from the previous year. The largest percentage declines have occurred among the Western expatriate communities. The numbers of German nationals fell to 240,113 in January 2015, down 31 percent. The numbers of expatriates from Spain, the United Kingdom, and the United States have each fallen by 36 to 41 percent.¹⁰⁵

The outflow of Russian and Western professionals is likely to dampen Russian economic growth. Of the two groups, the first is the more worrying. Western professionals have shown a willingness to work in a large array of countries provided they have access to interesting work and competitive compensation. In light of the large numbers of Westerners with long experience working in Russia, if the Russian economy begins growing again, businesses should be able to hire individuals with the necessary expertise. Moreover, a large pool of educated Russians is now available for work in financial or other business services, sectors in which Westerners have tended to be employed.

The bigger problem is the exodus of educated Russians. Like capital exports, to a substantial degree, the outflow of Russians reflects a lack of confidence in Russia and the Russian economy. Because these are the individuals most likely to start or work in dynamic, new businesses, their absence will curb Russian economic growth, especially in more technologically advanced sectors of the Russian economy. If the Russian economy picks up, some would return. But once Russian entrepreneurs and talented workers have put down roots abroad, they are less likely to do so. If they return, they may come for the money but then head back abroad when the Russian economy hits its next down cycle.

¹⁰²Rosstat, *Russia 2015: Statistical Pocketbook*, Moscow, 2015, p. 14; UNESCO, 2013. By comparison, about 50,000 tertiary-level Americans study abroad every year, according to UNESCO data.

¹⁰³Rosstat, "Russia in Figures," 2014, education statistics; United Nations High Commissioner for Refugees, *UNHCR Global Trends: Forced Displacement in 2014*, 2015, Annex, Table 1.

¹⁰⁴Cohen, Benovic, and Roberts, 2014.

¹⁰⁵Kathrin Hille, "Foreign Exodus from Russia Gathers Pace," *Financial Times*, February 4, 2015.

Prospects for Russian Economic Growth

Continuation of Current Trends

The Russian economy fell into recession in 2015. According to the European Bank for Reconstruction and Development, Russia's GDP likely fell 4.2 percent in 2015 and is likely to decline a further 1.2 percent in 2016.¹ Both the IMF and the Russian Ministry of Economy also take a sober view of Russia's medium-term growth prospects. After the recession in 2015, the IMF projects a modest recovery in 2016 followed by trend line growth of 1.5 percent per annum over the next several years, far below the 6.9-percent average annual growth rates of the boom years.² The Russian Ministry of Economy takes a slightly more bullish view. It projects trend line growth of about 2.2 percent after the end of the current recession. However, this growth rate is predicated on prices for Urals oil of \$60 per barrel.³ Even so, it is far below the average annual rates of the last decade.

If policies or events go awry, Russian economic growth could fall below either of these rates. Russia's growth has long depended heavily on imports of technologies, the ability of Russian companies to export, and improvements in productivity and quality driven by competition from imports. Trade and the benefits of FDI from the transfer of technologies, capital, and marketing and management expertise will produce gains only if Russia reverses its recent autarchic course and embarks on a renewed effort to open its economy. The combination of Western sanctions, low energy prices, autarchic economic policies, renationalization, corruption, and a poor business environment suggests that incoming FDI will not rebound in the near future. The Russian government's decision to expand the list of strategic industries barred to foreign investors will also curb inward FDI.

More-Favorable Prospects for Russia

What would need to happen for Russia to grow faster? In the following, we estimate potential increases to Russia's economic output or rates of growth for each of the factors discussed in

¹ European Bank for Reconstruction and Development, "Regional Economic Prospects in EBRD Countries of Operations," London, November 2015.

² IMF, "Russian Federation: Staff Report for the 2015 Article IV Consultation," Washington, D.C., Country Report 15/211, August 2015, p. 7.

³ Darya Korsunskaya, "The Ministry of Economy of the Russian Federation Worsened Its Three-Year Macroeconomic Forecast [Минэкономики РФ ухудшило трехлетний макропрогноз]," Reuters/Russia and CIS Countries, August 25, 2015.

Chapter Three: (1) higher world market prices for oil and natural gas, leading to an improvement in Russia's terms of trade coupled with a rebound in the REER; (2) an acceleration in the rate of growth due to the end of Putin's renationalization policy and a renewed aggressive effort to privatize Russia's state-owned and state-controlled enterprises; (3) an increase in output due to less corruption; (4) an increase in rates of economic growth due to higher investment stemming from the end of sanctions; (5) an acceleration in the rate of economic growth due to an improvement in the business climate; and (6) moderation in the decline in the labor force through higher-than-expected net immigration.

Table 4.1 shows our estimates of the potential effects of improvements in each of these factors. We evaluate each factor individually. For this reason, improvements in growth rates are not additive; there is a degree of double counting in the separate estimates. Consequently, we do not estimate combined effects.

Improvements in Russia's Terms of Trade Due to Rebound in Oil Prices

In Chapter Three, we estimated that, if lower oil prices persist, the recent 50-percent decline in the price of oil would lead to an 11-percent fall in GDP. This would be partially offset by a 6.7-percent increase in GDP stemming from the decline in the REER. If oil prices were to rise again, the deterioration in Russia's terms of trade were to be reversed, and the REER were to appreciate back to previous levels, the decline in output would be reversed. We estimate that, if oil prices and the REER return to their 2013 levels, Russia's GDP would enjoy a one-off increase of 4.5 percent. This percentage increase is higher than the decline because the baseline GDP is lower. Consequently, output would need to rise by 4.5 percent to reach its previous level.

Privatization

In Chapter Three, we estimated that the rate of growth in total factor productivity was 5.8 percent per year between 2000 and 2003, the period when Russia's private sector was the strongest, and 5.0 percent between 2003 and 2008, when oil prices were higher, but renationalization was already taking place. Following the 2009 recession, growth in total factor productivity fell

Table 4.1
Potential Increments to Russia Growth Rates

Factor	Increase in GDP or Growth Rate ^a
Improvement in terms of trade due to higher oil prices coupled with appreciation of the real effective exchange rate	4.5 ^b
Privatization	4.4
Reduction in corruption	0.3
End of sanctions	1.4
Improvement in the business environment	2.2
Increased immigration	0.1

SOURCE: RAND estimates.

^a In percentage points.

^b This effect is a one-off increase in GDP. The other figures are estimates of potential increases in the annual rate of growth in GDP.

sharply to 1.1 percent per year, while oil prices remained high. Not all of the reduction in the rate of growth in total factor productivity can be ascribed to renationalization. Nonetheless, the sharp deceleration is due, at least in part, to the less-productive use of capital by renationalized state-owned and state-controlled enterprises.

As noted above, the theoretical and empirical evidence that private firms operate more efficiently than state-owned or state-controlled enterprises is compelling. Russia would greatly benefit from aggressively privatizing state-owned assets, particularly in the oil and gas industry, where productivity gaps have been especially large.

We have attempted to provide a rough estimate of the potential increase in the rate of growth in total factor productivity by calculating the difference between total factor productivity growth between 2000 and 2008 (5.5 percent per year), when the private sector accounted for a larger share of assets and output, and between 2010 and 2013 (1.1 percent per year), when oil prices were still high, but the state played a much larger role in the economy. The difference in total factor productivity growth, and hence growth in GDP, was 4.4 percent. An aggressive privatization program and a retreat of the state from the Russian economy could thus lead to a substantial acceleration in economic growth.

Greatly Reduced Corruption

We drew on parameter estimates of the relationship between an index of corruption and levels of investment and Mauro's rate of growth in GDP to estimate a potential increase in the rate of Russian economic growth if Russia could reduce corruption to the extent that Romania had reduced corruption between 2000 and 2006. We calculated that reducing corruption to Romanian levels could have produced an annual rate of growth in Russian GDP that was 0.3 percentage point higher.

End of Sanctions

In South Africa, the share of GDP devoted to gross fixed capital investment fell from 26 to 19 percent after sanctions were tightened in the second half of the 1980s. In Russia, investment fell sharply after the imposition of sanctions led to higher interest rates; capital flight; and the scaling back of a number of foreign corporations, including General Motors, from operations in Russia. Gross fixed capital investment as a share of GDP fell to 19 percent in 2014.

To estimate the potential impact of an end to sanctions on Russia, we assumed that Russia fully implemented the Minsk accords regarding eastern Ukraine, thus ending the main sectoral sanctions. We also assumed that Russia pursued more-open economic policies and improved its business climate, making it more attractive to foreign investors. As a consequence of these changes in policy and sanctions, we projected that interest rate spreads would fall back to 2007 levels and that the share of gross fixed capital investment would rise to 26 percent, a healthy, but not high, level for a country undergoing rapid economic growth.

To calculate the increment to growth made possible by such changes, we decomposed growth in Russia's GDP into components for changes in labor and changes in capital. We developed a time series for the future size of the working-age population from UN population forecasts through 2025. We assumed that the labor force participation rate among the working-age population would remain at 75.8 percent throughout this period. This series was the basis for the input of Russian labor into GDP. We then projected a series for Russia's capital stock, assuming that 19 percent of the previous year's GDP was invested and that the depreciation rate was 8.5 percent annually, a figure we derived from Russian data on its capital stock

and Russian investment data between 2000 and 2008. We used the IMF projection of average annual growth rate of 1.5 percent to calculate the implied rate of growth in total factor productivity. We then recalculated GDP assuming that gross fixed capital investment increases to 26 percent of GDP. As a result of this shift, GDP increases by 2.9 percent per year, 1.4 percentage points more per annum than under the base case. Eliminating sanctions could add 1.4 percentage points to Russian growth under these assumptions.

Improvements in the Business Climate

Russia still has substantial room for improvements in its business climate, such as shortening the length of time it takes to get construction permits and connect businesses to electric power, protecting minority investors, and facilitating customs clearance. The IMF argues that improvements in the regulatory environment for financial services alone could raise Russia's rate of growth in GDP by 1 percentage point. If Russia were to reduce banking sector fragmentation through consolidation, increase banking supervision and regulation, tighten capital standards, and strengthen the role of credit bureaus and collateral registries, credit allocation would improve, systemic financial risk would fall, and financial services would become more competitive.⁴

To estimate the potential increment to growth that improving the business environment might make possible, we used the same model that we used to calculate the potential increment to growth rates from eliminating sanctions. However, in this instance, we assumed that Russia would become so much more attractive to investors that it would no longer be a net exporter of capital. Capital exports averaged 10.4 percentage points of GDP between 2000 and 2014, so the share of gross fixed capital investment in GDP would rise to 29.4 percent, adding an additional 2.2 percentage points to average annual growth in GDP.

More-Welcoming Immigration Policies

Russia's population is declining; all demographers project continued substantial declines over the coming decades. The cohort of working-age Russians (20 to 65 years old) is also falling. As shown in Figure 3.14, the size of these cohorts is projected to fall sharply over the next two decades. Increases in capital and growth in total factor productivity will need to be substantial to offset the effects of this decline. To mitigate these effects, Russia could encourage immigration, but this would require a major shift in policy.

Here, we assumed that net inflows of immigrants stayed at their 2013–2014 levels, rather than declining. As a consequence, the decline in the working-age population would be 9 percent, rather than 12 percent. Using this larger working-age population, we projected the size of Russia's working-age population, assuming, as in the baseline case, that the labor force participation rate among the working-age population remained at 75.8 percent. We then employed the same model of Russian GDP that we used to calculate the potential increases in Russia's growth rates from lifting sanctions and improving the business climate. In this case we assumed that investment remained at 19 percent of GDP but that the labor force would fall by 10 percent, instead of the baseline 12 percent, between 2015 and 2025. Our calculations suggest that an increase in migration would have a modest impact on GDP, raising annual growth rates by about 0.1 percentage point.

⁴ IMF, 2015, p. 19.

Policy Implications

Several factors, not just the recent decline in world oil market prices, are likely to lead to a slow recovery from Russia's 2015–2016 recession. Although the Russian government has little or no control over world market prices for oil, changes in its policies could result in substantially higher rates of economic growth. We cross-walked policy changes with the analysis above to identify those policies that would likely have the largest influence on economic growth.

There is much that the Russian government could do internally to accelerate growth. A combination of an aggressive program to privatize state-owned assets, clamping down on corruption, and improving the business environment should accelerate growth in total factor productivity. Total factor productivity grew at an average annual rate of 5.5 percent between 2000 and 2008 and of 1.1 percent 2010 and 2013. Making these policy changes could at least nudge the growth rate of total factor productivity back toward previous levels.

It is difficult to envision Russia attracting the increases in investment necessary to accelerate economic growth in the current foreign policy environment. If Russia were to fully implement the Minsk accords regarding eastern Ukraine, all sanctions except for those associated with its annexation of Crimea would likely be eliminated. The removal of sanctions and improved relations with the West could boost GDP growth by at least 1.4 percentage points per year.

More-welcoming immigration policies would also boost growth. Although we only analyzed the economic effects of maintaining net immigration at recent levels, a much more welcoming policy toward immigrants could have an appreciable effect, mitigating the decline in the population of working-age Russians.

Without major policy changes, the Russian economy will grow slowly in the medium term, even if world market prices for oil rebound sharply by the end of the decade. Changes in current policies back to policies that Russia has pursued in the recent past would lead to substantially higher rates of growth.

We believe it unlikely that the Russian government will make all or, in fact, any of these policy changes. However, we believe it is useful to tote up the opportunity costs for Russia of its government's current course of action.

Theoretical Background

There is a substantial literature, both theoretical and empirical, investigating the effects of terms-of-trade shocks and changes in the REER on consumption, savings, investment, the current account deficit, and national output. The theoretical models yield an array of (sometimes contrasting) predictions. One of the key messages that emerges is that the effects of an adverse terms-of-trade shock depend strongly on the expected duration of the shock, on the relative strength of the consumption and investment responses, and on the strength of the interactions between different sectors of the economy.

Consider a small, open economy that produces one good that is exported and one good that is nontraded and that imports a third good. The economy is small, in that it takes the prices of the exported and imported goods as given. Suppose this economy faces an exogenous, adverse terms-of-trade shock—that is, the price of its export good falls relative to the price of its import good.

Early studies focused on the income effect from a deterioration in the terms of trade. Because the price of the imported good rises relative to the exported good, the terms-of-trade shock lowers a country's income, leading to decreased consumption.¹ More-recent studies have framed the issue in terms of a representative consumer's intertemporal utility maximization problem and have argued that there are several competing effects on consumption. Moreover, the persistence of the terms-of-trade shock plays an important role:²

- Consumption-smoothing effect: In an intertemporal utility maximization problem, consumers are assumed to smooth their consumption based on their permanent income. Thus, a permanent, adverse terms-of-trade shock lowers permanent income, causing consumers to reduce their consumption accordingly, with little impact on savings. However, a temporary terms-of-trade shock does not lower permanent income; thus, consumers will draw on savings to smooth their consumption during the temporary decline in income.

¹ Arnold C. Harberger, "Currency Depreciation, Income and the Balance of Trade," *Journal of Political Economy*, Vol. 58, No. 1, February 1950; Sven Laursen and Lloyd A. Metzler, "Flexible Exchange Rates and the Theory of Employment," *Review of Economics and Statistics*, Vol. 32, No. 4, November 1950.

² Early works include Maurice Obstfeld, "Aggregate Spending and the Terms of Trade: Is There a Laursen-Metzler Effect?" *Quarterly Journal of Economics*, Vol. 97, No. 2, May 1982, and Lars E. O. Svensson and Assaf Razin, "The Terms of Trade and the Current Account: The Harberger-Laursen-Metzler Effect," *Journal of Political Economy*, Vol. 91, No. 1, February 1983. Also see Cashin and McDermott, 2002, and Jonathan D. Ostry and Carmen M. Reinhart, "Private Saving and Terms of Trade Shocks: Evidence from Developing Countries," *International Monetary Fund Staff Papers*, Vol. 39, No. 3, September 1992.

- Consumption-tilting effect: A temporary, adverse terms-of-trade shock increases the intertemporal rate of interest that consumers face by making it more expensive to consume imported goods today than tomorrow. Thus, consumers may defer consumption during the terms-of-trade shock and increase savings. This effect will not be present in the case of a permanent terms-of-trade shock.
- Real exchange rate effect: A terms-of-trade shock increases the price of imported goods relative to nontraded goods, and thus makes consumers substitute toward nontraded goods. This effect is present for both permanent and temporary shocks.

Several models also examine how terms-of-trade shocks affect investment. For example, one early model shows the importance of the role of the nontraded goods market in driving investment.³ In this model, the export sector is relatively capital intensive, and firms choose optimal investments by equating the marginal cost of installing new capital with its marginal value. In the event of a permanent terms-of-trade shock, the effect on investment depends on whether consumption of nontraded goods increases (as consumers substitute away from imports) or decreases (as overall income as fallen).

A more-recent study focuses on the fact that investment includes an imported component.⁴ In this case, the economy specializes in one good that can be domestically consumed, invested, or exported. When investment includes some imported content, an adverse terms-of-trade shock lowers the marginal product of capital in terms of foreign goods. Thus, in the case of a permanent adverse terms-of-trade shock, the amount of capital stock will decline in the long run, and the amount by which it declines is increasing in the import content of capital goods. In the case of a temporary, adverse terms-of-trade shock, the terms of trade are expected to improve in the future, so the current cost of capital is lower than the future cost. In addition, the current profitability of capital is lower than anticipated future profitability. Whether investment falls or rises thus depends on the relative strength of the (temporary) decrease in profitability versus the (relatively low) cost of capital. The longer the transitory shock, the more important profit considerations are relative to the anticipated future rise in capital cost and the more likely investors are to lower investment in the short run.

The role played by the nontraded goods market is also highlighted in the “Dutch disease” literature, which focuses on the effect of a boom in the natural-resource sector on the rest of the economy.⁵ In a simple model, a boom in the natural resource sector increases incomes in that sector; if at least some of the additional income is spent on nontraded goods, it causes real appreciation (spending effect). At the same time, resources are drawn out of the nontraded sector and the import-competing sector and into the exporting sector (resource movement effect). This, in turn, increases real appreciation, drawing even more resources out of the import-competing sector and into the nontraded sector. Thus, the import-competing sector shrinks, while the nontraded goods sector may either shrink or grow, depending on whether

³ Robert G. Murphy, “The Terms of Trade, Investment, and the Current Account,” *Journal of International Economic Integration*, Vol. 7, No. 1, Spring 1992.

⁴ Servén, 1999.

⁵ W. M. Corden, “Booming Sector and Dutch Disease Economics: Survey and Consolidation,” *Oxford Economic Papers*, Vol. 36, 1984.

the spending effect or the resource movement effect dominates.⁶ We can view a decline in the terms of trade through the lens of a decline in returns to the natural resource sector, so these shifts should work in the opposite direction.

As discussed above, the theoretical literature has posited that a terms-of-trade shock affects consumption through a variety of channels, including intertemporal and intratemporal substitution effects. Empirical work has shown that these substitution effects are sizable for some countries.⁷ With respect to the overall response of macroeconomic indicators to a terms-of-trade shock, evidence from 18 oil-exporting developing countries from 1965–1989 demonstrates a positive relationship between terms-of-trade shocks and consumption and investment and a negative relationship between terms-of-trade shocks and savings. Terms-of-trade improvements are also associated with an appreciation in the REER (relative prices of nontraded goods) and with the value added of nontraded construction and service sectors but are not associated with concurrent contractions in agriculture or manufacturing (“Dutch disease”).⁸

A recent empirical study provides support to the idea that the persistence of a terms-of-trade shock matters. The study posits a simple model: With a permanent and positive terms-of-trade shock, investment will increase immediately, but capital stock will not increase until the following period; thus, permanent income will be higher than current income. This leads to a current account deficit today due both to current investment and to consumption-smoothing by consumers. With a temporary but persistent shock, permanent income is lower than current income; consumption smoothing will therefore tend to increase the current account surplus in the short term, but investment will tend to decrease it. The more persistent the shock, the more important the investment effect, leading to a current account deficit. The study then used data from 128 countries from 1970–1999 to show, consistent with the model predictions, that the current account balance rises immediately for low-persistence shocks, then falls back to initial levels. In the case of high-persistence shocks, the initial rise in the current account balance is lower, and the current account falls into deficit over time.⁹

A number of studies also document a strong, positive link between commodity prices and the REER for commodity and oil-exporting countries, including Russia.¹⁰ In addition, the price of oil and the REER are found to be strongly correlated with Russian growth (positive for price of oil, negative for REER).¹¹

On a related note, a study of terms-of-trade shocks in developing countries shows that the nature of the exchange rate regime has a strong impact on how the shock is transmitted through the economy. In a flexible regime, the nominal exchange rate and the REER depreciate following an adverse terms-of-trade shock. The rise in the price of imported goods also

⁶ It is worth noting that these results are based on a number of strong assumptions; changing these assumptions (for example, by examining the case in which the exported good is also used by consumers or is an intermediate input to the other sectors) can affect the results.

⁷ Paul Cashin and C. John McDermott, “Intertemporal Substitution and Terms-of-Trade Shocks,” *Review of International Economics*, Vol. 11, No. 4, September 2003; Ostry and Reinhart, 1992.

⁸ Spatafora and Warner, 1999.

⁹ Kent and Cashin, 2003.

¹⁰ See Coudert, Couharde, and Mignon, 2008, for a summary.

¹¹ IMF, “Russian Federation: Selected Issues and Statistical Appendix,” Washington, D.C., 2002.

raises the Consumer Price Index. While there is also a reduction in GDP, it is fairly small. In contrast, in fixed regimes, there is little change in the nominal or real interest rates and a slight decline in the Consumer Price Index, but a larger reduction in GDP.¹²

¹² Christian Broda, "Terms of Trade and Exchange Rate Regimes in Developing Countries," *Journal of International Economics*, Vol. 63, No. 1, May 2004; Broda and Tille, 2003.

Labor Productivity and Ownership

Table B.1
Labor Productivity of Russia's Largest 20 Companies, 1999

Rank	Company	Branch	Revenue (\$M U.S.)	Employees in 1998 (000s)	Labor Productivity	Labor Productivity Ranking ^a
1	RAO "UES of Russia"	Electric power	22,349.5	697.8	313.6	45
2	Gazprom	Oil and gas industry	17,496.9	278.4	615.3	10
3	Oil company "Lukoil"	Oil and gas industry	8,341.2	102	800.6	4
4	Bashkir Fuel Company ^b	Oil and gas industry	3,379.1	104.8	315.7	44
5	Siberian and Far Eastern Oil Company (SIDANCO) ^c	Oil and gas industry	3,203.5	80	392	31
6	Surgutneftegaz	Oil and gas industry	3,122.4	77.4	394.7	30
7	AvtoVAZ	Mechanical engineering	2,681.8	110.3	238.1	71
8	Norilsk Nickel ^b	Nonferrous metallurgy	2,564.6	115	218.3	80
9	The oil company "Yukos"	Oil and gas industry	2,479.5	93.7	259.1	64
10	Sibneft	Oil and gas industry	2,082.8	47	433.8	23
11	Tyumen Oil Company	Oil and gas industry	1,752.7	39.6	433.7	24
12	Severstal	Ferrous metallurgy	1,733.1	46.9	362.1	35
13	Tatneft	Oil and gas industry	1,730.2	46.7	362.6	34
14	Alrosa ("Diamonds of Russia-Sakha")	Nonferrous metallurgy	1,715.1	35.9	467.6	18
15	Slavneft ^b	Oil and gas industry	1,707.6	27.6	606	11
16	Rosneft	Oil and gas industry	1,528.1	56.1	266.7	59
17	GAZ	Mechanical engineering	1,486.8	107.2	135.8	130
18	Magnitogorsk Iron and Steel Works	Ferrous metallurgy	1,314.2	27.8	462.3	20
19	Novolipetsk Steel	Ferrous metallurgy	1,127.1	46.4	237.9	72
20	Orenburg Oil Company (ONAKO) ^b	Oil and gas industry	758.7	27.7	268.3	58

SOURCE: Expert RA, "Ranking of the Largest Russian Companies by Sales Volume, 1999," Web page, undated a.

^a Among top-200 companies.

^b Holdings of the company, consolidated data for all enterprises of the holding.

^c Holding "SIDANCO" did not provide a formal statement of consolidated data, assessment is made on the basis of data published in the media.

Table B.2
Labor Productivity of Russia's Largest 20 Companies by Turnover, 2014

Rank	Company	Branch	Revenue (\$M U.S.)	Employees (000s)	Labor Productivity (000s rubles/person)
1	Gazprom	Oil and gas industry	161,247.2	423	381
2	Lukoil	Oil and gas industry	119,118.0	150	794
3	Rosneft	Oil and gas industry	99,529.9	106	939
4	Russian Railways	Transport	55,244.1	943	59
5	Sberbank	Banks	54,008.1	330	164
6	AFK "System"	Diversified holdings	35,942.1	70	513
7	Surgutneftegaz	Oil and gas industry	26,253.0	118	222
8	Russian network	Electric power	23,810.1	190	125
9	VTB Group	Banks	23,710.4	101	235
10	Transneft	Transport	23,491.6	106	222
11	The "Inter RAO"	Electric power	20,755.9	58	355
12	Magnet	Retail	18,166.6	217	84
13	X5 Retail Group	Retail	16,784.7	117	143
14	EVRAZ	Ferrous metallurgy	14,411.0	100	144
15	Tatneft	Oil and gas industry	14,258.3	81	177
16	Severstal	Ferrous metallurgy	13,311.6	17	792
17	MMC Norilsk Nickel	Nonferrous metallurgy	11,465.9	83	138
18	OPK Oboronprom	Mechanical engineering	11,305.9	N/A ^a	N/A ^a
19	VimpelCom	Telecommunications	10,994.6	66	167
20	Novolipetsk Steel (NLMK)	Ferrous metallurgy	10,909.4	62	177

SOURCES: Data on turnover are from Expert RA, undated b. Employment data are from "The World's Biggest Public Companies," database, *Forbes*, undated.

^a Employment and labor productivity were not calculated due to irregularities in reporting about the company's number of employees.

Abbreviations

BRICS	Brazil, Russia, India, China, and South Africa
CBR	Central Bank of Russia
CIS	Commonwealth of Independent States
FDI	foreign direct investment
GDP	gross domestic product
IES	Institut Energiticheskoy Strategii
IMF	International Monetary Fund
INDEM	[Russian think tank]
MET	mineral extraction tax
OECD	Organisation for Economic Co-operation and Development
PPP	purchasing power parity
REER	real effective exchange rate
SOE	state-owned enterprise
UN	United Nations
UNESCO	UN Educational, Scientific and Cultural Organization

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