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Abstract

Between the end of the 1990s and the first decade of the 2000s Russia experienced significant growth in GDP per capita that was driven by transitional convergence, structural reforms, and improvements in the terms of trade. Reforms to the structure of the economy boosted growth by over 2 percentage points per annum with improvements in telecommunication infrastructure, financial development, and a reduction in the GDP share of government consumption being the most important structural reforms. The paper discusses Russia's growth performance relative to comparator countries: countries in the European and Central Asia regions, advanced natural resource exporting countries and the BRICS countries. Economic growth was significantly lifted in advanced natural resource exporting countries due to the international commodity price boom, for example, in Russia improvements in the terms of trade lifted growth by over 1 percentage point per annum. In the group of advanced natural resource exporting countries and BRICS countries, Russia is at the forefront in terms of growth benefits arising from structural reforms.

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Abstract: Between the end of the 1990s and the first decade of the 2000s Russia experienced significant growth in GDP per capita that was driven by transitional convergence, structural reforms, and improvements in the terms of trade. Reforms to the structure of the economy boosted growth by over 2 percentage points per annum with improvements in telecommunication infrastructure, financial development, and a reduction in the GDP share of government consumption being the most important structural reforms. The paper discusses Russia's growth performance relative to comparator countries: countries in the European and Central Asia regions, advanced natural resource exporting countries and the BRICS countries. Economic growth was significantly lifted in advanced natural resource exporting countries due to the international commodity price boom, for example, in Russia improvements in the terms of trade lifted growth by over 1 percentage point per annum. In the group of advanced natural resource exporting countries and BRICS countries, Russia is at the forefront in terms of growth benefits arising from structural reforms.

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1. Introduction

During the 2000s Russia experienced significant growth. Measured over a 5-year window, the average constant price PPP GDP per capita increased from about US\$8,000 during 1996-2000 to about US\$14,000 during 2006-2010 (see Figure 1A). This paper examines the driving forces behind Russia's economic growth during that period. The focus is on medium term growth, i.e. changes in GDP per capita over a 10-year period. The paper will examine what part of Russia's growth is due to transitional convergence, structural reforms, stabilization policies and external conditions.

At the end of the 1990s Russia experienced a significant drop in GDP per capita. The drop in GDP per capita during the 1996-2000 period reflects the Russian financial crisis that occurred in 1998. One question that arises from this observation is to what extent Russia's economic growth during the 2000s was due to transitional convergence – i.e. a reversion to country-specific steady state? An empirical regularity is that growth is higher after a recession. We estimate a dynamic model that accounts for this feature. Our model shows that transitional convergence lifted economic growth in Russia during the 2000s by around 1 percentage point per annum.

The Russian economy underwent significant structural reforms during the 2000s. In the periods 1996-2000 and 2006-2010 there was (i) an increase in financial development; (ii) a reduction in the government burden; (iii) an expansion of telecommunication infrastructure; (iv) an increase in trade openness; (v) a decline in schooling (see Figure 1B). Our estimates show that due to these structural reforms economic growth was lifted by over 2.6 percentage points per annum.

Compared to the 1990s, during which Russia experienced hyperinflation, the 2000s were relatively calm with regard to price stability (see Figure 1C). Inflation in Russia during 1991-1995 was around 500 percent on average; and around 50 percent during 1996-2000. During the 2000s the improvement in price stability continued, with average inflation around 10 percent per annum. The Russian Rubble gained significantly in value during the 2000s and this contributed to an appreciation

of the real exchange rate. Between 1996-2000 and 2006-2010 there was a two-fold increase in the real exchange rate. Our estimates show that the decline in inflation boosted growth by around 0.1 percentage points per annum; the appreciation of the real exchange rate decreased growth by around 0.4 percentage points per annum. These figures suggest that changes in variables influenced by stabilization policies had a relatively small effect on economic growth.

During the 2000s Russia benefited from favorable external conditions. There was a significant boom in the international commodity prices; e.g. the international price of oil underwent a more than fourfold increase between 1996-2000 and 2006-2010. Russia is a net-exporter of oil, and the Russian oil and gas sector is large comprising about two-thirds of total exports. The increase in the international oil price implied a substantial improvement in Russia's terms of trade. Between 1996-2000 and 2006-2010 there was a nearly two-fold increase in Russia's net barter terms of trade (see Figure 1C). Our estimates show that due to these favorable external conditions economic growth was lifted in Russia by about 1.5 percentage points per annum.

The paper discusses Russia's growth performance relative to comparator countries. One particular group of comparator countries that is of interest are the advanced natural resource exporting countries, i.e. high income countries that are major exporters of natural resources. Other comparator country groups discussed in this paper are the countries of the Europe and Central Asia (ECA) region and the BRICS countries. Advanced natural resource exporting countries experienced significant improvements in their terms of trade during the 2000s. Our estimates show that economic growth was lifted in all of the advanced natural resource exporting countries due to improvements in the terms of trade. The growth benefit that Russia experienced due to improvements in the terms of trade puts Russia at the median relative to other advanced natural resource exporting countries. Russia ranks first among the group of advanced natural resource exporting countries in terms of growth that was due to structural reforms. This ranking is maintained when comparing Russia to the BRICS (Brazil, Russia,

India, China, South Africa). These countries received significant inflows of capital during the 2000s. Our estimates show that among the BRICS Russia is at the forefront with regard to growth arising from structural reforms. The comparative analysis thus suggests that, in Russia, the growth contribution of structural reforms during the 2000s was remarkable. The finding that structural reforms contributed significantly to economic growth during the 2000s is not specific to Russia -- it also holds for the majority of other ECA countries.

The rest of the paper is organized as follows. Section 2 describes the estimation framework. Section 3 presents the estimates of the econometric model. Section 4 discusses sources of Russia's growth and sets these in comparative perspective. Section 5 summarizes.

2. Estimation Framework

The econometric model builds on the work of Loayza et al. (2005) and Araujo et al. (2014).¹ The change in the natural logarithm of real GDP per capita between two periods is related to the lagged level of the natural logarithm of GDP per capita and a set of growth determinants, X :

$$(1.0) \quad \ln y_{ct} - \ln y_{ct-1} = \phi \ln y_{ct-1} + \Gamma \ln(X)_{ct} + a_c + b_t + e_{ct}$$

where $\ln y_{ct} - \ln y_{ct-1}$ is the change in the natural logarithm of real PPP GDP per capita in country c between period t and $t-1$; $\ln y_{ct-1}$ is the natural logarithm of real PPP GDP per capita of country c in period $t-1$; a_c and b_t are country and time fixed effects; and e_{ct} is an error term.

The vector of growth determinants, X_{ct} , includes the natural logarithms of secondary enrolment, the GDP share of domestic credit to the private sector, trade openness, the GDP share of government consumption, telephones lines per capita, inflation, the real exchange rate, an indicator of systemic banking crises, and the growth rate of the terms of trade. Additional variables that we include in X_{ct} are the Polity2 score, which is a measure of the degree of political competition and political constraints, as

¹ The discussion in this Section as well as in Section 3 follows closely Araujo et al. (2014).

well as the growth rate of an international commodity export price index that captures windfalls from international commodity price booms.

The natural logarithm of lagged GDP per capita is included in equation (1) in order to account for transitional convergence. In cross-sectional regressions (conditional) convergence is about whether poor countries grow faster than rich countries (conditional on country characteristics). In a panel model that includes country fixed effects transitional convergence is about whether countries' GDP per capita reverts to the country-specific steady state, a_c . Transitional convergence in the level of GDP per capita requires that $|\phi| < 1$. Note that equation (1) can be re-written as:

$$(1') \quad \ln y_{ct} = \theta \ln y_{ct-1} + \Gamma \ln(X)_{ct} + a_c + b_t + e_{ct}$$

where $\theta = 1 + \phi$. This formulation makes it clear that, with $-1 < \theta < 1$, the estimated model is a stationary AR(1) model for the *level* of GDP per capita. In this model a permanent perturbation to the level of X has a temporary (i.e. short-run) effect on GDP per capita growth. There is a permanent (i.e. long-run) effect on the level of GDP per capita but not on the GDP per capita growth rate. In the discussion that follows transitional convergence and persistence will all be used interchangeably.

A further issue in the estimation of equation (1) is that some of the growth determinants, X_{ct} , may be a function of GDP per capita growth. We will address this type of endogeneity bias by treating the relevant variables as endogenous regressors in the system-GMM estimation. In particular, we will instrument endogenous variables with their lags. We limit the instrument set to one lag in order to ensure that the number of instruments does not grow too large in the system-GMM estimation.

We use for the estimation of the baseline econometric model 5-year non-overlapping panel data. 5-year non-overlapping panel data are commonly used in growth analysis. In contrast to quarterly or annual data, which are used in business cycle analysis, 5-year non-overlapping data smooth variations of the business cycle. 5-year non-overlapping data are thus useful for analysis of economic growth in the medium run.

The baseline econometric model is estimated for a sample of 126 countries spanning the period 1970-2010. Estimating the model based on the largest possible sample of countries ensures that, given the availability of data, the coefficients are estimated as precise as possible (statistical efficiency). There is trade-off however between statistical efficiency and potential bias that arises from restricting the coefficients to be the same across countries and periods. Data for Russia and countries that were part of the former Soviet Union are available for the post-1990 period only. Hence, two important questions arise:

- i. Do the coefficients differ for the post-1990 period?
- ii. Do the coefficients differ for ECA countries?

The first question can be answered by extending the econometric model to include interaction terms between X and an indicator variable that is unity for the post-1990 period. The extended model is:

$$(1.1) \quad \ln y_{ct} = \theta_1 \ln y_{ct-1} + \Gamma_1 \ln(X)_{ct} + \theta_2 \ln y_{ct-1} * \text{post1990}_t + \Gamma_2 \ln(X)_{ct} * \text{post1990}_t + c_c + d_t + u_{ct}$$

In equation (1.1), the parameter θ_1 captures persistence during the pre-1990 period; the vector Γ_1 captures the marginal effects of changes in X on (transitional) GDP per capita growth for the pre-1990 period. The coefficient θ_2 captures the difference in persistence between the pre-1990 and the post-1990 period. The persistence for the post-1990 period is given by $\theta_1 + \theta_2$. The vector Γ_2 captures the difference in the impact that changes in X have on (transitional) GDP per capita growth for the post-1990 period. The overall marginal effects of changes in X on (transitional) GDP per capita growth for the post-1990 period are given by $\Gamma_1 + \Gamma_2$.

The second question can be answered by extending the baseline model to include interaction terms between X and an indicator variable that is unity for ECA countries:

$$(1.2) \quad \ln y_{ct} = \theta_3 \ln y_{ct-1} + \Gamma_3 \ln(X)_{ct} + \theta_4 \ln y_{ct-1} * \text{ECA}_c + \Gamma_4 \ln(X)_{ct} * \text{ECA}_c + e_c + f_t + \varepsilon_{ct}$$

In equation (1.2), for countries outside the ECA region, the parameter θ_3 captures persistence and the vector Γ_3 captures the marginal effects of changes in X on (transitional) GDP per capita growth for the pre-1990 period. The coefficient θ_4 captures the difference in persistence for the ECA region (relative to the rest of the world). Persistence for the countries in the ECA region is given by $\theta_3+\theta_4$. The vector Γ_4 captures the difference in the impact that changes in X have on (transitional) GDP per capita growth for the ECA region. The marginal effects of changes in X on (transitional) GDP per capita growth for countries in the ECA region are given by $\Gamma_3+\Gamma_4$.

Table 1 provides a description of the variables used in the econometric analysis and their sources.

3. Estimation Results

3.1 Baseline Estimates

Column (1) of Table 2 presents the baseline system-GMM estimates. These estimates are based on an unbalanced panel covering 126 countries during the 1970-2010 period. The estimated econometric model supports the key feature of neoclassical growth models of convergence in real GDP per capita. The estimated coefficient on lagged (log) GDP per capita is 0.78 and has a standard error of 0.06. We can thus reject the null hypothesis that the coefficient is equal to zero and unity at the conventional significance levels. It is important to note that the estimated coefficient is derived from a 5-year non-overlapping panel. The coefficient thus reflects the persistence of shocks to GDP per capita over a 5-year horizon; measured over a one-year horizon the implied persistence parameter is 0.95 and the implied per annum convergence rate is around 5 percent.

The estimates from the multivariate regression model support the hypothesis that structural reforms are important growth determinants. Variables relating to structural reforms such as financial development, trade openness, and infrastructure enter with a significant positive coefficient while the

government burden enters with a significant negative coefficient. Education and political institutions have an insignificant effect. With regard to variables relating to stabilization policies, such as inflation, the real exchange rate and banking crises, the coefficients are negative though not significant. As the coefficients on these variables are obtained from a multivariate regression model, they should be interpreted as conditional effects.² These conditional effects may differ from the unconditional effects. We will explore unconditional effects in the next sub-section.

Figure 2 facilitates the interpretation of the estimates reported in column (1) of Table 5 by showing a bar plot of the estimated coefficients multiplied with their standard deviations. The magnitude of the impact that variables relating to structural reforms have on economic growth is substantial. For example, a one standard deviation increase in infrastructure, financial development, and trade openness is predicted to increase five-year GDP per capita growth by 27 percentage points, 7 percentage points, and 6 percentage points, respectively; a reduction in the government burden of one standard deviation is predicted to increase five-year GDP per capita growth by 16 percentage points. The effect of stabilization policies is more nuanced: a one standard deviation increase in the real exchange rate, inflation, and the risk of banking crisis is predicted to decrease five-year GDP per capita growth by around 4 percentage points, 1 percentage point, and 1 percentage point, respectively.

The multivariate regression model also shows that external conditions mattered for economic growth. Variations in countries' terms of trade and international commodity export prices are significantly positively related to economic growth. Because both the terms of trade and the international commodity export price index are country-specific variables, the estimated coefficients on these variables capture the country-specific effects of external conditions.

For comparison to the system-GMM estimates, we report in column (2) of Table 2 least squares estimates. The least squares estimates reveal qualitatively a similar pattern as the system-GMM

² An F-test on the joint significance of variables in the category of structural reforms (stabilization policies) yields a p-value of 0.00 (0.19) in column (1) and 0.00 (0.08) in column (2).

estimates. Structural policies are significantly correlated with economic growth. Also, least squares estimates on variables related to stabilization policies are significant. Quantitatively, the least squares estimates are generally smaller in absolute value than the system-GMM estimates. This could in part reflect classical measurement error that attenuation attenuates least squares estimates but not instrumental variables estimates. Another reason could be endogeneity biases that are corrected for in the system-GMM regression but not in the least squares regression.

3.2 Are the Effects Different for the ECA Region?

In this section we discuss whether the growth effects of structural reforms and stabilization policies are significantly different for the ECA region. The question whether the growth effects are different in the ECA region can be examined by adding to the econometric model interaction terms between the right-hand-side variables, X , and an indicator variable that is unity for countries that are part of the ECA region. The coefficients on these interaction terms give the differences in the marginal effects of changes in the variables X on GDP per capita for the ECA region (relative to the rest of the world).

Table 3 shows the relevant results. Column (1) reports the coefficients on the linear terms (the Γ_3 in equation 1.2); column (2) reports the coefficients on the interaction terms (the Γ_4 in equation 1.2). The main result is that there is no evidence that the growth effects of structural reforms and stabilization policies are significantly different for the ECA region. This can be seen from the statistically insignificant coefficients on the ECA dummy interaction terms that are reported in column (2) of Table 3.

3.3 Are the Effects of Structural and Stabilization Policies Different for the Post-1990 and Post-2000 Period?

This Section explores whether the growth effects of structural reforms and stabilization policies

significantly vary for the post-1990 period (and the post-2000 period). We report estimates from a model that interacts the variables relating to structural and stabilization policies with an indicator variable for the post-1990 (post-2000) period. Significant coefficients on these interaction terms would suggest that the growth effects of structural reforms and stabilization policies differ for the post-1990 (post-2000 period).

The estimates in Table 4A show that the effects of structural and stabilization policies are not significantly different for the 2000s. The coefficients on the post-2000 interaction terms (reported in column (2)) are quantitatively small for the majority of variables. For none of the variables are the coefficients on the post-2000 interaction terms significantly different from zero. Table 4B shows that, except for infrastructure, the effects of structural reforms and stabilization policies are not significantly different for the post-1990 period.

3.4. Actual vs. Predicted Growth for the 2000s

In this section we evaluate how well the estimated model replicates observed GDP per capita growth. Beyond comparing predicted to actual growth, we will discuss how much of the contribution to predicted GDP per capita growth arises from persistence (transitional convergence), structural reforms, stabilization policies, and external conditions.

Table 5 reports predictions of GDP per capita growth for: (i) all countries in the sample, (ii) all countries excluding ECA; (iii) ECA countries only; (iv) Russia; (v) BRICS (Brazil, Russia, India, China,, and South Africa) and Mexico; (vi) EU11 and EU accession countries; (vii) and advanced natural resource exporters (Australia, Canada, Chile, Norway, and Russia). For each time period, we generated predicted GDP per capita growth using the estimated coefficients in column (1) of Table 2 and the observed changes in each of the right-hand-side variables. Table 5 shows that the predictions from the model have the right sign for all periods and samples. Quantitatively, the predictions are also

fairly close to the actual values. For the world sample, the actual average change in log GDP per capita over a five-year horizon between the period 2006-2010 and the 2001-2005 is 0.16 log points while the predicted change is 0.17 log points; over a ten-year horizon between 2006-2010 and 1996-2000 the actual average change is 0.27 log points while the predicted change is 0.32 log points. For the period between 1996-2000 and 1991-1995, the actual change in log GDP per capita is 0.09 log points while the predicted change is 0.12 log points.

For the ECA region the predicted changes in log GDP per capita have the same sign as the actual changes in log GDP per capita. Quantitatively, the predictions are also fairly close to the observed changes in GDP per capita. The actual average change in log GDP per capita over a five-year horizon between 2006-2010 and 2001-2005 is 0.21 log points while the predicted change is 0.19 log points. Over a ten-year horizon between 2006-2010 and 1996-2000 the actual average change is 0.38 log points while the predicted change is 0.38 log points. For the period between 1996-2000 and 1991-1995, the actual change in log GDP per capita is 0.09 log points while the predicted change is 0.13 log points.

For Russia the predicted changes in log GDP per capita have the same sign as the actual changes in log GDP per capita. Quantitatively, the predictions are also fairly close to the observed changes in GDP per capita.³ The actual average change in log GDP per capita between the 2006-2010 period and the 2001-2005 period is 0.42 log points while the predicted change is 0.32 log points. Over a ten-year horizon between 2006-2010 and 1996-2000 the actual average change is 0.61 log points while the predicted change is 0.48 log points. For the period between 1996-2000 and 1991-1995, the actual change in log GDP per capita is -0.16 while the predicted change is -0.18.

For the group of the BRICS and Mexico the predicted changes in log GDP per capita have the same sign as the actual changes in log GDP per capita. Quantitatively, the predictions are also fairly

³ The difference between predicted and actual growth is a bit larger than for the ECA region and this is as expected due to the smaller sample size (which implies greater uncertainty).

close to the observed changes in GDP per capita. The actual average change in log GDP per capita between 2006-2010 and 2001-2005 is 0.24 log points while the predicted change is 0.17 log points. Over a ten-year horizon between 2006-2010 and 1996-2000 the actual average change is 0.41 log points while the predicted change is 0.41 log points. For the period between 1996-2000 and 1991-1995, the actual change in log GDP per capita is 0.17 while the predicted change is 0.21.

For the group of the EU11 and EU accession countries the predicted changes in log GDP per capita have the same sign as the actual changes in log GDP per capita. The actual average change in log GDP per capita between the 2006-2010 period and the 2001-2005 period is 0.24 log points while the predicted change is 0.26 log points. Over a ten-year horizon between 2006-2010 and 1996-2000 the actual average change is 0.45 log points while the predicted change is 0.49 log points. Hence the model is predicting economic growth of the EU11 and EU accession countries in the decade between 2006-2010 and 1996-2000 well. For the period between 1996-2000 and 1991-1995, the actual change in log GDP per capita is 0.18 while the predicted change is 0.01. The difference between actual and predicted growth for this period is not unexpected since not much time had passed since countries of the EU11 and EU accession group had exited from the Iron Curtain (Soviet hegemony).

For the group of advanced natural resource exporting countries the predicted changes in log GDP per capita have the same sign as the actual changes in log GDP per capita. The actual average change in log GDP per capita between 2006-2010 and 2001-2005 is 0.10 log points while the predicted change is 0.18 log points. Over a ten-year horizon between 2006-2010 and 1996-2000 the actual average change is 0.21 log points while the predicted change is 0.41 log points. For the period between 1996-2000 and 1991-1995, the actual change in log GDP per capita is 0.19 while the predicted change is 0.21.

In Table 6 we report predicted changes in log GDP per capita for each of the ECA countries in the sample for the 2000s. The last four columns of the table show the breakdown of these predicted

changes in GDP per capita due to persistence, structural reforms, stabilization policies, and external conditions. Figure 3 illustrates for Russia these results graphically in form of a bar plot.

Section 4. Drivers of Growth in Russia during the 2000s

The most important contribution to Russia's GDP per capita growth during the 2000s came from structural reforms. During the 2000s improvements in the structure of the Russian economy contributed to about 2.6 percentage points higher per annum GDP per capita growth. This contribution is sizable. To better grasp its significance, it is useful to compare the growth contribution of structural reforms to the growth contribution of transitional convergence (persistence). Transitional convergence contributed to about 1.0 percentage points higher GDP per capita growth during the 2000s. Hence, the contribution of structural reforms to Russia's GDP per capita growth during the 2000s was about two and half times that of transitional convergence.

Of the changes in the structure of the Russian economy that occurred during the 2000s, the increase in the size of the financial sector was the most important one in terms of lifting GDP per capita growth. Between the periods 1996-2000 and 2006-2010, the GDP share of domestic credit to the private sector increased, from 12 percent in 1996-2000 to 41 percent in 2006-2010. The more than three-fold increase in the GDP share of domestic credit to the private sector lifted GDP per capita growth by about 0.9 percentage points per annum.

Reductions in the government burden also contributed considerably to higher GDP per capita growth. The GDP share of government consumption declined between the periods 1996-2000 and 2006-2010 by about more than a quarter -- from 10.3 percent in 1996-2000 to 7.5 percent in 2006-2010. As a consequence of this decline in the government burden GDP per capita growth increased by more than 0.8 percentage points per annum.

The third most important structural reform was the expansion of the telecommunications sector.

The availability of telephone lines on a per capita basis increased between the periods 1996-2000 and 2006-2010 by more than 50 percent. During the 1996-2000 period nearly one in every five Russians had a telephone line. By the 2006-2010 period nearly one in every three Russians had a telephone line. As a consequence of this expansion in infrastructure, GDP per capita growth was lifted by over 0.6 percentage points per annum.

The contribution of schooling and political institutions to Russia's GDP per capita growth during the 2000s was relatively minuscule, i.e. less than 0.1 percentage points per annum. The trend in the decline of education that was present in Russia throughout the 1990s continued throughout the 2000s. Between the periods 1996-2000 and 2006-2010 the secondary school enrolment rate decreased by around six percentage points -- from 91.5 percent in 1996-2000 to 85.6 percent in 2006-2010. According to data from the Polity IV project, Russia was an anocracy between 1996-2000 and 2006-2010. Russia's Polity2 score was 3.6 in 1996-2000 and 5 in 2006-2010. These values suggest that Russia was still in political transition during the 2000s, leaning more towards the side of democracy than autocracy.⁴

Favorable external conditions contributed substantially to higher GDP per capita growth in Russia during the 2000s. On a per annum basis, Russia's GDP per capita growth during the 2000s was about 1.5 percentage points higher due to international commodity price windfalls and improvements in the terms of trade. That Russia benefited from the international commodity price boom of the 2000s -- specifically, from the boom in the international price of oil -- is not surprising: About two-thirds of the country's merchandise exports come from the exports of mineral fuels. Between 1996-2000 and 2006-

4 The Polity IV (2010) country report on Russia states that: "In March 2000, Russia accomplished its first peaceful and democratic transfer of executive power in the nation's history as President Vladimir Putin was elected in an 11-candidate race to succeed retiring Boris Yeltsin. Despite minor electoral irregularities and strong government influence over the media, independent observers judged the elections to be generally free and fair.... While far from consolidated, nevertheless, democratic norms and institutions in Russia have been bolstered by the electoral contests of the past decade. " With regard to political constraints, the report states that Russia has only "moderate limitations" on the executive; i.e. political constraints fall short of those inherent in western democracies.

2010 the international oil price increased by a factor of four, from about US\$23 per barrel in 1996-2000 to about US\$88 per barrel in 2006-2010. The commodity price windfalls that Russia received during the 2000s translated into higher GDP per capita growth. Given that actual GDP per capita growth was about 6 percent, about one-quarter of Russia's growth was due to favorable external conditions during the 2000s.

Stabilization policies had only minor effects on Russia's GDP per capita growth during the 2000s. Between 1996-2000 and 2006-2010 GDP per capita growth was about 0.3 percentage points lower per annum due to deteriorations in variables that are related to stabilization policies. While decreases in inflation contributed to a relatively minor increase in GDP per capita growth, increases in the real exchange rate had somewhat larger, negative effects on GDP per capita growth. Between 1996-2000 and 2006-2010, inflation decreased in Russia by about 26 percentage points, from about 38 percent per annum to 12 percent per annum. The increase in price stability had only a minor effect on economic growth: GDP per capita growth was lifted by about 0.1 percent per annum as a consequence of the 26 percentage points decrease in the inflation rate that occurred between 1996-2000 and 2006-2010. The more than doubling of the real exchange rate that occurred between 1996-2000 and 2006-2010 lowered GDP per capita by about 0.4 percentage points per annum. Hence, real exchange rate appreciation that occurred throughout the 2000s had larger effects on economic growth than the decrease in inflation.

Comparing Russia to other ECA countries

The finding that structural reforms contributed significantly economic growth during the 2000s is not specific to Russia -- it also holds for the majority of other ECA countries. Figure 5 provides a bar plot of the contribution to changes in GDP per capita between 1996-2000 and 2006-2010 from structural reforms (blue bars) and stabilization policies (red bars). For 35 out of 45 ECA countries the

contribution of structural reforms to economic growth is larger in absolute value than that of stabilization policies. The ECA country with the largest growth contribution of structural reforms is Azerbaijan: structural reforms lifted growth in Azerbaijan by around 4.7 percentage points per annum. For comparison, the value of the contribution of structural reforms to growth in Russia is 2.6 percentage points per annum. The average contribution of structural reforms to economic growth in the top ten ECA countries with the highest growth contribution of structural reforms is 3 percentage points per annum.

Russia's economic performance, as measured by real PPP GDP per capita growth during the 2000s, is remarkable when compared to other ECA countries. Russia is among the top ten ECA countries in terms of growth during the 2000s (Figure 6). The figure provides a bar plot of the changes in the logs of GDP per capita for ECA countries between 1996-2000 and 2006-2010. The country with the highest GDP per capita growth is Azerbaijan. Between 1996-2000 and 2006-2010 Azerbaijan's change in the log of GDP per capita was around 1.3. For comparison, Russia's change in the log of GDP per capita was around 0.6. And the average change in the log of GDP per capita in the top ten ECA countries with the highest GDP per capita growth rate was around 0.8.

Russia is among the top three ECA countries where economic growth was lifted the most due to favorable external conditions. Figure 7 provides a bar plot for ECA countries of the contribution to the changes in the logs of GDP per capita between 1996-2000 and 2006-2010 that are due to changes in external conditions. Norway was the country that experienced the largest growth benefit from changes in external conditions during the 2000s: Norway's GDP per capita growth was lifted due to favorable external conditions by around 2.3 percentage points per annum. For comparison, the contribution of favorable external conditions to economic growth in Russia was around 1.0 percentage points per annum during the 2000s. The two other former Soviet Union countries where GDP per capita growth was lifted substantially by favorable external conditions were Azerbaijan and Kazakhstan: favorable

external conditions lifted economic growth in these countries during the 2000s by around 0.9 and 1.8 percentage points per annum, respectively.

Russia and other former Soviet Union oil-exporting countries benefited from favorable external conditions during the 2000s. Thus, the question arises how important structural reforms were for these oil exporting countries? Figure 8 plots the growth contribution from transitional convergence, structural reforms, stabilization policies, and external conditions for four major oil exporting countries that are part of the ECA region. From Figure 8 we see that, for Russia, the contribution to economic growth from structural reforms was higher than from favorable external conditions. This is also true for the other former Soviet Union countries, Azerbaijan and Kazakhstan, that are major oil exporting countries. External conditions contributed to GDP per capita growth in Azerbaijan, Kazakhstan, and Russia by 0.8, 1.8, and 1.5 percentage points per annum, respectively; the contribution to growth from structural reforms was 4.7, 2.7, and 2.6 percentage points per annum, respectively. Hence, during the 2000s structural reforms were more important for lifting economic growth of former Soviet Union oil-exporting countries than external conditions.

In order to further appreciate the above result, it is useful to note that in Norway the contribution to economic growth from structural reforms during the 2000s was relatively minuscule: External conditions lifted Norway's GDP per capita growth by around 2.3 percentage points per annum while the contribution from structural reforms was less than 0.1 percentage points per annum. The relatively minuscule growth contribution of structural reforms in Norway reflects that Norway had a much more favorable structure of the economy at the beginning of the period; consequently there was less potential for structural reforms in Norway than there was in Russia. (In 1996-2000 Russia's GDP share of domestic credit to the private sector was 0.12, the GDP share of government consumption was 0.10, the ratio of exports plus imports over GDP was 0.42, and the value of telephones lines per 100 people was at around 20. For Norway these values were 0.65, 0.07, 0.72, and 57, respectively.)

During the 2000s structural reforms lifted economic growth more in oil-exporting ECA countries than in oil-importing ECA countries. Figure 9 plots the average growth contribution from transitional convergence, structural reforms, stabilization policies, and external conditions for two groups: oil-exporting ECA countries and oil-importing ECA countries. In the group of oil-exporting ECA countries, structural reforms between the period 1996-2000 and 2006-2010 lifted economic growth by around 2.5 percentage points per annum. For comparison, in Russia the corresponding value is 2.6 percentage points per annum. These values imply that Russia's growth contribution of structural reforms was similar to that of the average ECA oil-exporting country. In contrast, for the group of oil-importing countries, structural reforms lifted economic growth by around 1.1 percentage points per annum. Structural reforms lifted economic growth by more than twice as much in oil-exporting ECA countries than in oil-importing ECA countries. For comparison, the growth contribution of stabilization policies and transitional convergence was similar between oil-exporting and oil-importing ECA countries. Transitional convergence contributed to the change of log GDP per capita between 1996-2000 and 2006-2010 by around 2.1 percentage points on average for the group of oil-exporting ECA countries and 2.4 percentage points for the group of oil-importing ECA countries. The contribution of stabilization policies was less than -0.2 percentage points per annum for oil-importing and oil-exporting ECA countries.

The contribution to economic growth during the 2000s from structural policies was larger in developing ECA countries than in developed ECA countries. Figure 10 plots the average growth contribution from transitional convergence, structural reforms, stabilization policies, and external conditions for the groups of developing and developed ECA countries. In the group of developing ECA countries, structural reforms between the period 1996-2000 and 2006-2010 lifted economic growth by around 2.1 percentage points per annum. For the group of developed ECA countries, structural reforms lifted economic growth by around 0.8 percentage points per annum. Hence, structural reforms lifted

economic growth in developing ECA countries by nearly three times as much as in developed ECA countries. For comparison, in Russia the corresponding contribution to growth from structural reforms is 2.6 percentage points per annum. These values imply that Russia's growth contribution of structural reforms was more than three times that of the average developed ECA country; the contribution of structural reforms to economic growth in Russia was about 20 percent larger than the average ECA developing country.

Countries of the former Soviet Union implemented structural reforms that enhanced economic growth during the 2000s to a greater extent than the structural reforms that were implemented in other non-Soviet ECA countries. Figure 11 plots the average growth contribution from persistence, structural reforms, stabilization policies, and external conditions for the group of former Soviet Union countries and the group of countries that were not part of the former Soviet Union. In the group of former Soviet Union countries, structural reforms between the period 1996-2000 and 2006-2010 lifted economic growth by around 2.3 percentage points per annum. For the group of countries that were not part of the former Soviet Union, structural reforms lifted economic growth by around 1.0 percentage points per annum. Hence, structural reforms lifted economic growth in the former Soviet Union countries by more than twice as much as in countries that were not part of the former Soviet Union. For comparison, the growth contribution of stabilization policies and transitional convergence was similar between the group of countries that were part of the former Soviet Union and the group of countries that were not part of the former Soviet Union. In the former group, transitional convergence contributed to the change of log GDP per capita between 1996-2000 and 2006-2010 by around 2.5 percentage points per annum while in the latter group the effect amounts to around 2.3 percentage points. For both groups of countries the contribution of stabilization policies was around -0.2 percentage points per annum.

Russia's growth performance in the decade between 1996-2000 and 2006-2010 is also remarkable when compared to EU11 and EU accession countries. Between 1996-2000 and 2006-2010

the change in log GDP per capita for the group of EU11 countries was 0.46 while for the group of EU accession countries it was 0.42. This compares to a 0.61 change in the log of GDP per capita for Russia over that period. Figure 12 plots the contribution of stabilization policies, structural reforms, transitional convergence, and external conditions to the growth experience of the group of EU11 and EU accession countries. Structural reforms contributed substantially to economic growth in EU11 and EU accession countries, about 2 percentage points per annum. This is slightly below that of Russia: structural reforms lifted economic growth in Russia by over 2.6 percentage points per annum between 1996-2000 and 2006-2010. Stabilization policies and changes in external conditions had only a minor effect on economic growth in the EU11 and EU accession countries. In contrast, in Russia changes in external conditions had a significant effect on the macroeconomy boosting economic growth by over 1.5 percentage points per annum.

Comparing Russia to the BRICS and Mexico

Figure 13 shows that the growth performance of the BRICS and Mexico is bi-polar. On one pole there are China, India, and Russia that experienced substantial growth in GDP per capita between 1996-2000 and 2006-2010; on the other pole there are Brazil, Mexico, and South Africa with positive but more modest growth. China stands out with a change in the natural logarithm of GDP per capita between 1996-2000 and 2006-2010 of about 0.9. Russia's and India's change in the natural logarithm of PPP GDP per capita for the relevant time period was around 0.6 and 0.5, respectively. On average economic growth in China, India, and Russia was more than three times the growth of Brazil, Mexico, and South Africa: between 1996-2000 and 2006-2010 the change in the natural logarithm of PPP GDP per capita was 0.28 for South Africa, 0.16 for Brazil and 0.14 for Mexico.

Improvements in structural policies lifted economic growth in the BRICS. Among this group of countries the effect is largest for Russia. Figure 14A plots the contribution to economic growth from

structural reforms for the BRICS and Mexico. The largest growth effects of structural reforms arose in Russia, China, and India amounting to about 2.6, 2.5, and 2.0 percentage points per annum, respectively. More modest improvements that contributed to economic growth were realized in Brazil and Mexico. In these countries economic growth was lifted due to structural reforms by around 1.4 and 1.2 percentage points per annum, respectively. South Africa is the only country in the group of the BRICS where the evolution of structural reforms was adverse putting a drag on GDP per capita growth. For the period between 1996-2000 and 2006-2010 deteriorations in structural reforms shaved off about 0.6 percentage points per annum of South Africa's GDP per capita growth.

Russia fared worst in terms of the growth contribution of stabilization policies. Figure 14B plots the contribution to economic growth from stabilization policies for the BRICS and Mexico. Inflationary pressures and an appreciation of the real exchange rate had a negative effect on economic growth in Russia between 1996-2000 and 2006-2010, causing a decrease in per annum GDP per capita growth of about 0.3 percentage points. Similarly, China's economic growth was slowed by around 0.2 percentage points per annum due to adverse developments in stabilization policies. In Brazil, South Africa, and India stabilization policies contributed less than 0.1 percentage points per annum to economic growth whereas in Mexico economic growth was lifted by nearly half a percentage point per annum. Quantitatively, these effects are relatively small when compared to the impact that structural reforms had on economic growth.

Russia is the country that among the BRICS and Mexico benefited by far the most from favourable external conditions between 1996-2000 and 2006-2010. Figure 14C plots the contribution to economic growth from external conditions for the BRICS and Mexico. Between 1996-2000 and 2006-2010 improvements in Russia's terms of trade lifted economic growth by around 1.5 percentage points per annum. Over the same period there were also sizable growth benefits from favorable external conditions that materialized in South Africa and Mexico. In these countries economic growth was

boosted by about 0.5 and 0.4 percentage points per annum, respectively. The growth effect of changes in external conditions was modest for India, amounting to less than 0.2 percentage points per annum. China is the country among the BRICS where economic growth was dampened due to adverse external conditions. Deteriorations in the terms of trade shaved off about 0.3 percentage points from China's per annum GDP per capita growth between 1996-2000 and 2006-2010.

Figure 14D plots the contribution to economic growth between 1996-2000 and 2006-2010 from transitional convergence for the BRICS and Mexico. The largest effect materialized in China where economic growth was boosted by over 6 percentage points per annum. In India the growth contribution of transitional convergence was also sizable amounting to over 3 percentage points per annum. Smaller effects were realized in South Africa, Mexico, Russia, and Brazil. In these countries the growth contribution of transitional convergence was about 1.5, 1.1, 1.0, and 0.8 percentage points per annum, respectively

Comparing Russia to Advanced Natural Resource Exporting Countries

Figure 15 shows that between 1996-2000 and 2006-2010 Russia had the highest rate of PPP GDP per capita growth among the group of advanced natural resource exporting countries. Russia's GDP per capita growth rate was more than twice that of Chile which had the second highest PPP GDP per capita growth rate among the group of advanced natural resource exporting countries. PPP GDP per capita growth amounted in Chile to about 3 percentage points per annum between 1996-2000 and 2006-2010. Other advanced natural resource exporting countries also experienced positive rates of economic growth; but these fell short of the economic growth rate experienced by Russia. Between 1996-2000 and 2006-2010 the average annual PPP GDP per capita growth rates for Australia, Canada, and Norway were around 2 percentage points per annum.

Figure 16A plots the contribution to economic growth from structural reforms for the group of

advanced natural resource exporting countries. In this group Russia is the country where structural reforms boosted economic growth the most. The country with the second largest gain from structural reforms among the group of advanced natural resource exporting countries is Australia. In Australia structural reforms caused an increase in the change of the natural logarithm of PPP GDP per capita between 1996-2000 and 2006-2010 of around 0.06. This is sizable but in Russia the growth benefit from structural reforms was over four times the Australian figure. Chile's GDP per capita growth was lifted due to structural reform by about 0.5 percentage points per annum. In Norway and Canada there was little change in the structure of the economy throughout the time period analysed; consequently there was little change in economic growth due to structural reform. This is not surprising as in these countries high levels of education, infrastructure, and financial development were already in place.

Russia fared worst among the group of advanced natural resource exporting countries in terms of the growth contribution of stabilization policies. Figure 16B plots the contribution to economic growth from stabilization policies for Russia, Australia, Canada, Norway, and Chile. Inflationary pressures and an appreciation of the real exchange rate had a negative effect on economic growth in Russia between 1996-2000 and 2006-2010, causing a decrease of GDP per capita growth of about 0.3 percentage points per annum. Australia's economic growth was slowed by around 0.2 percentage points per annum due to adverse developments in stabilization policies. In Canada and Norway the effect of adverse developments in stabilization policies was around -0.15 percentage points per annum. In Chile the effect of stabilization policies on economic growth was negligible.

Among the group of advanced natural resource exporting countries, Russia is at the median in terms of the contribution to economic growth that arose from favourable external conditions. Figure 16C plots the contribution to economic growth from external conditions for the relevant sample. The figure shows that favourable external conditions between 1996-2000 and 2006-2010 lifted economic growth significantly in all of the advanced natural resource exporting countries. The country that

benefited the most from favorable external conditions was Norway, followed by Chile. Between 1996-2000 and 2006-2010 improvements in Norway's terms of trade lifted economic growth by around 2.2 percentage points per annum. In Chile the effect is around 2.1 percentage points per annum. Russia is at the median in terms of the growth contribution of favorable external conditions: between 1996-2000 and 2006-2010 Russia's economic growth was boosted due to improvements in the terms of trade by around 1.5 percentage points per annum. Over the same period there were also sizable growth benefits from favorable external conditions that materialized in Australia and Canada. In these countries favorable external conditions boosted economic growth by about 1.3 and 1.0 percentage points per annum, respectively.

Figure 16D plots the contribution to economic growth from transitional convergence (persistence) for advanced natural resource exporting countries. The largest transitional convergence effect materialized in Chile where economic growth was boosted by over 3 percentage points per annum. In Norway, Australia, and Canada transitional convergence effects amounted to about 2 percentage points. In Russia the growth effect of transitional convergence was smallest amounting to about 1 percentage point per annum.

5. Summary

From the end of the 1990s to the first decade of the 2000s Russia experienced significant growth in GDP per capita driven by transitional convergence, structural reforms, and improvements in the terms of trade. This paper estimated determinants of economic growth in Russia for that time period. Reforms to the structure of the economy boosted growth by over 2 percentage points per annum. The three most important structural reforms were improvements in telecommunication infrastructure, financial development, and a reduction in the GDP share of government consumption. Improvements in the terms of trade lifted growth in Russia by over 1 percentage point per annum. Economic growth was

significantly lifted in advanced natural resource exporting countries due to the international commodity price boom; in terms of growth benefits arising from structural reforms Russia is at the forefront in the group of advanced natural resource exporting countries. Further, among the BRICS -- that experienced significant capital inflows during the 2000s -- Russia is at the forefront in terms of growth benefits from structural reforms.

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Table 1. Description of Variables

Variable	Description	Source
Growth Rate of GDP per capita	The change in the natural logarithm of real PPP GDP per capita between period t and $t-1$.	PWT 7.1
Lagged GDP per capita	The natural logarithm of real PPP GDP per capita in period $t-1$.	PWT 7.1
Schooling	The natural logarithm of the secondary school enrolment rate.	WDI (2013)
Financial Development	The natural logarithm of the ratio of domestic credit to the private sector divided by GDP. Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment.	WDI (2013)
Trade Openness	The natural logarithm of the ratio of exports plus imports over PPP GDP adjusted for countries' population size.	PWT 7.1
Telecommunication Infrastructure	The natural logarithm of main telephone lines per capita. Telephone lines are fixed telephone lines that connect a subscriber's terminal equipment to the public switched telephone network and that have a port on a telephone exchange. Integrated services digital network channels and fixed wireless subscribers are included.	WDI (2013)
Government Burden	The logarithm of the ratio of government consumption expenditures over GDP.	PWT 7.1
Political Institutions	The polity2 score measures the degree of political constraints, political competition, and executive recruitment. It ranges between -10 to 10 with higher values denoting more democratic institutions.	Polity IV
Inflation	The natural logarithm of 100+consumer price inflation rate. CPI inflation reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services.	WDI (2013)
Real Exchange Rate	The natural logarithm of the GDP price level divided by the nominal exchange rate.	PWT 7.1
Banking Crisis	Indicator Variable that is unity in period t if the country experienced a banking crisis.	Reinhart and Rogoff (2011)
Terms of Trade Growth	The change in the natural logarithm of the net barter terms of trade index. The net barter terms of trade index is calculated as the percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000.	WDI (2013)
ComPI Growth	The change in an international commodity export price index. The index is constructed as	Arezki and Brueckner (2012)

$$\text{ComPI}_{ct} = \prod_{i \in I} \text{ComPrice}_{it}^{\theta_{ic}}$$

where ComPrice_{it} is the international price of commodity i in year t , and θ_{ic} is the average (time-invariant) value of exports of commodity i in the GDP of country c . Data on international commodity prices are from UNCTAD Commodity Statistics and data on the value of commodity exports are from the NBER-United Nations Trade Database (Feenstra et al., 2004). The commodities included in the index are aluminum, beef, coffee, cocoa, copper, cotton, gold, iron, maize, oil, rice, rubber, sugar, tea, tobacco, wheat, and wood.

Table 2. Economic Growth Regressions

	Dependent Variable: ln(GDP p.c.)	
	(1)	(2)
	SYS GMM	FE OLS
<i>Persistence</i>		
ln(GDP p.c.), t-1	0.78*** (0.06)	0.75*** (0.03)
<i>Structural Policies and Institutions</i>		
Schooling	0.02 (0.05)	-0.03 (0.03)
Financial Development	0.07*** (0.03)	0.02 (0.02)
Trade Openness	0.08* (0.05)	0.10*** (0.03)
Government Burden	-0.26*** (0.04)	-0.13*** (0.03)
Telecommunication Infrastructure	0.14*** (0.03)	0.08*** (0.02)
Political Institutions	-0.00 (0.03)	-0.01 (0.02)
<i>Stabilisation Policies</i>		
Inflation	-0.01 (0.01)	-0.01* (0.01)
Real Exchange Rate	-0.06 (0.04)	-0.02 (0.03)
Banking Crisis	-0.04 (0.03)	-0.05* (0.03)
<i>External Conditions</i>		
ComPI Growth	10.48*** (2.69)	6.96*** (2.59)
Terms of Trade Growth	0.12*** (0.03)	0.11*** (0.03)
Country Fe	Yes	Yes
Year Fe	Yes	Yes
Observations	464	464
Countries	126	126

Note: The dependent variable is real GDP per capita. The method of estimation in column (1) is system-GMM; column (2) least squares. *Significantly different from zero at the 10 percent significance level, ** 5 percent significance level, *** 1 percent significance level.

Table 3. Economic Growth Regressions
(Are the Growth Effects of Structural and Stabilization Policies Significantly Different in ECA Countries?)

Dependent Variable: ln(GDP p.c.)		
	(1)	(2)
	SYS GMM	SYS GMM
	Coefficient (SE) for Linear Term	Coefficient (SE) for Interaction with ECA Dummy
Schooling	0.00 (0.04)	0.30 (0.40)
Financial Development	0.08*** (0.03)	-0.02 (0.11)
Trade Openness	0.10** (0.04)	0.02 (0.17)
Government Burden	-0.28*** (0.04)	0.09 (0.14)
Telecommunication Infrastructure	0.14*** (0.03)	-0.05 (0.15)
Political Institutions	0.01 (0.03)	-0.20 (0.03)
Inflation	-0.02 (0.01)	0.04 (0.04)
Real Exchange Rate	-0.06* (0.03)	-0.05 (0.24)
Banking Crisis	-0.01 (0.03)	-0.11 (0.08)
Country Fe	Yes	Yes
Year Fe	Yes	Yes
Observations	464	464
Countries	126	126

Note: The dependent variable is real GDP per capita. The method of estimation is system-GMM. Columns (1) and (2) report estimates from an interaction model where the variables in the vector X are interacted with a dummy variable that is unity for ECA countries, see equation (1.2). Column (1) reports coefficients in the vector Γ_3 , column (2) reports coefficients in the vector Γ_4 . *Significantly different from zero at the 10 percent significance level, ** 5 percent significance level, *** 1 percent significance level.

Table 4A. Economic Growth Regressions
(Time Heterogeneity: Post 2000s)

Dependent Variable: ln(GDP p.c.)		
	(1)	(2)
	SYS GMM	SYS GMM
	Linear Term	Interaction with Post 2000 Dummy
Schooling	0.05 (0.03)	-0.03 (0.03)
Financial Development	0.12*** (0.03)	-0.04 (0.03)
Trade Openness	0.18*** (0.06)	-0.10 (0.08)
Government Burden	-0.10** (0.05)	0.02 (0.03)
Telecommunication Infrastructure	0.11*** (0.03)	0.02 (0.01)
Political Institutions	-0.002 (0.002)	-0.003 (0.002)
Inflation	-0.04 (0.07)	-0.02 (0.19)
Real Exchange Rate	-0.14*** (0.04)	-0.03 (0.03)
Banking Crisis	-0.07*** (0.02)	-0.04 (0.06)
Country Fe	Yes	Yes
Year Fe	Yes	Yes
Observations	464	464
Countries	126	126

Note: The dependent variable is real GDP per capita. The method of estimation is system-GMM. *Significantly different from zero at the 10 percent significance level, ** 5 percent significance level, *** 1 percent significance level.

Table 4B. Economic Growth Regressions
(Time Heterogeneity: Post 1990s)

Dependent Variable: ln(GDP p.c.)		
	(1)	(2)
	SYS GMM	SYS GMM
	Linear Term	Interaction with Post-1990 Dummy
Schooling	0.06** (0.03)	-0.00 (0.02)
Financial Development	0.10*** (0.03)	-0.01 (0.02)
Trade Openness	0.19*** (0.07)	-0.15 (0.10)
Government Burden	-0.10** (0.05)	0.02 (0.02)
Telecommunication Infrastructure	0.12*** (0.02)	0.03*** (0.01)
Political Institutions	-0.002 (0.002)	-0.001 (0.002)
Inflation	-0.04** (0.02)	0.01 (0.14)
Real Exchange Rate	-0.16*** (0.05)	0.02 (0.05)
Banking Crisis	-0.07*** (0.02)	-0.04 (0.05)
Country Fe	Yes	Yes
Year Fe	Yes	Yes
Observations	464	464
Countries	126	126

Note: The dependent variable is real GDP per capita. The method of estimation is system-GMM. *Significantly different from zero at the 10 percent significance level, ** 5 percent significance level, *** 1 percent significance level.

Table 5. Economic Growth Regressions
(Actual vs. Predicted Growth)

Period and Country	(1) Actual Change: 2006-2010 vs. 2001-2005	(2) Predicted Change: 2006- 2010 vs. 2001-2005	(3) Actual Change: 2001-2005 vs. 1996-2000	(4) Predicted Change: 2001- 2005 vs. 1996-2000	(5) Actual Change: 1996-2000 vs. 1991-1995	(6) Predicted Change: 1996- 2000 vs. 1991-1995
World	0.16	0.17	0.11	0.15	0.09	0.12
World, Excluding ECA	0.15	0.15	0.09	0.15	0.09	0.13
ECA Region Only	0.21	0.19	0.17	0.18	0.20	0.09
Russia	0.32	0.42	0.29	0.06	-0.16	-0.18
BRICS+Mexico	0.24	0.17	0.17	0.24	0.17	0.21
EU11 and EU Accession	0.24	0.26	0.21	0.23	0.18	0.01
Advanced Natural Resource Exporter	0.10	0.18	0.11	0.23	0.19	0.21

Note: The predictions are generated based on the estimates reported in column (2) of Table 5. To convert numbers into per annum changes, all values have to be divided by 5. *Significantly different from zero at the 10 percent significance level, ** 5 percent significance level, *** 1 percent significance level.

Table 6 Economic Growth Regressions
(Actual vs. Predicted Changes in Log GDP per capita: ECA Countries 2000s)

Period and Country	Actual Change	Predicted Change	Predicted Change w/o External Conditions	Persistence	Structural Reforms	Stabilization Policies	External Conditions
2006-2010 vs 1996-2000							
albania	0.67	0.80	0.80	0.38	0.44	-0.02	0.00
armenia	0.88	0.67	0.65	0.56	0.12	-0.03	0.02
austria	0.19	0.16	0.16	0.16	0.04	-0.04	0.01
azerbaijan	1.33	0.81	0.72	0.28	0.47	-0.02	0.08
belarus	0.80	0.77	0.77	0.44	0.32	0.02	0.01
belgium	0.17	0.13	0.13	0.15	0.02	-0.04	0.00
bosnia and herzegovina	0.40	1.26	1.24	1.06	0.21	-0.03	0.02
bulgaria	0.51	0.26	0.23	0.12	0.11	0.00	0.03
croatia	0.34	0.42	0.39	0.28	0.13	-0.02	0.03
cyprus	0.17	0.17	0.15	0.16	0.00	-0.02	0.02
denmark	0.11	0.26	0.23	0.16	0.10	-0.04	0.03
estonia	0.61	0.73	0.57	0.44	0.15	-0.02	0.16
finland	0.25	0.28	0.27	0.26	0.02	-0.01	0.02
france	0.13	0.16	0.14	0.12	0.06	-0.04	0.02
georgia	0.59	0.37	0.34	0.39	-0.04	-0.01	0.04
germany	0.13	0.14	0.12	0.09	0.06	-0.03	0.02
greece	0.31	0.30	0.29	0.23	0.09	-0.03	0.01
hungary	0.32	0.36	0.35	0.23	0.17	-0.04	0.01
iceland	0.10	0.11	0.06	0.06	0.06	-0.05	0.05
ireland	0.29	0.64	0.63	0.51	0.13	-0.02	0.01
israel	0.14	0.18	0.18	0.10	0.06	0.01	0.00
italy	0.07	0.12	0.11	0.11	0.01	-0.01	0.01
kazakhstan	0.88	0.66	0.48	0.25	0.27	-0.03	0.18
latvia	0.64	0.83	0.63	0.43	0.24	-0.03	0.20
lithuania	0.55	0.54	0.49	0.30	0.21	-0.03	0.05
luxembourg	0.29	0.31	0.31	0.25	0.08	-0.02	0.00
macedonia	0.25	0.10	0.11	0.05	0.07	-0.02	-0.01
malta	0.17	0.17	0.19	0.21	0.00	-0.02	-0.02
moldova	0.42	0.32	0.32	-0.01	0.35	-0.03	0.00
montenegro	0.43	0.28	0.28	0.14	0.18	-0.05	0.00
netherlands	0.15	0.25	0.16	0.18	0.01	-0.03	0.09
norway	0.16	0.43	0.21	0.22	0.00	-0.01	0.23
poland	0.41	0.44	0.42	0.33	0.09	-0.01	0.02
portugal	0.09	0.14	0.15	0.18	0.01	-0.04	-0.01
romania	0.51	0.61	0.59	0.24	0.34	0.01	0.02
russia	0.61	0.48	0.33	0.10	0.26	-0.03	0.15
serbia	0.40	0.13	0.13	0.03	0.11	-0.01	0.00
slovenia	0.37	0.47	0.45	0.32	0.14	0.00	0.01
spain	0.17	0.28	0.26	0.21	0.07	-0.02	0.01
sweden	0.25	0.30	0.26	0.19	0.08	-0.01	0.04
switzerland	0.14	0.06	0.08	0.07	0.05	-0.03	-0.02
turkey	0.25	0.15	0.16	0.15	-0.01	0.01	-0.01
ukraine	0.68	0.44	0.41	0.09	0.34	-0.01	0.03
united kingdom	0.21	0.29	0.26	0.25	0.03	-0.03	0.04
uzbekistan	0.47	0.23	0.18	0.07	0.08	0.03	0.05
ECA average	0.38	0.38	0.34	0.23	0.13	-0.02	0.04

Note: The predictions are generated based on the estimates reported in column (2) of Table 5. To convert numbers into per annum changes, all values have to be divided by 10. *Significantly different from zero at the 10 percent significance level, ** 5 percent significance level, *** 1 percent significance level.

Figure 1A. GDP per capita
(Russia, 1991-2010)

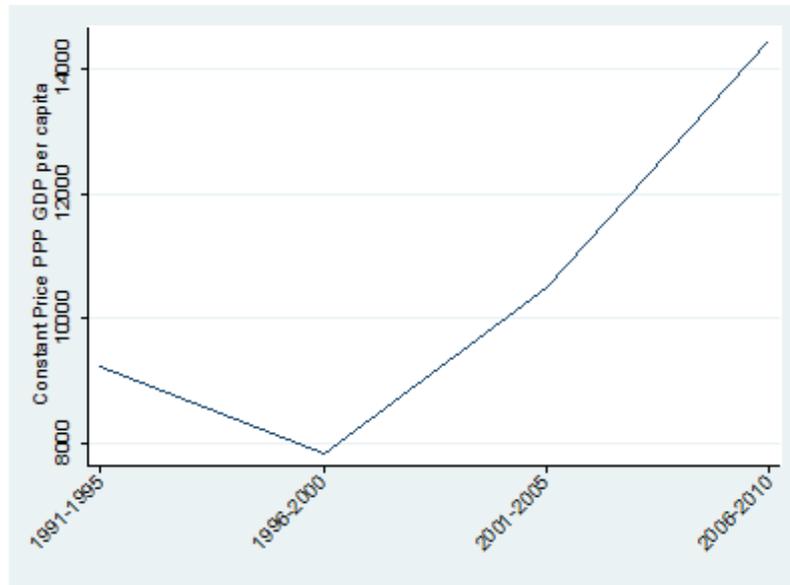


Figure 1B. Political Institutions and Structural Reforms
(Russia, 1991-2010)

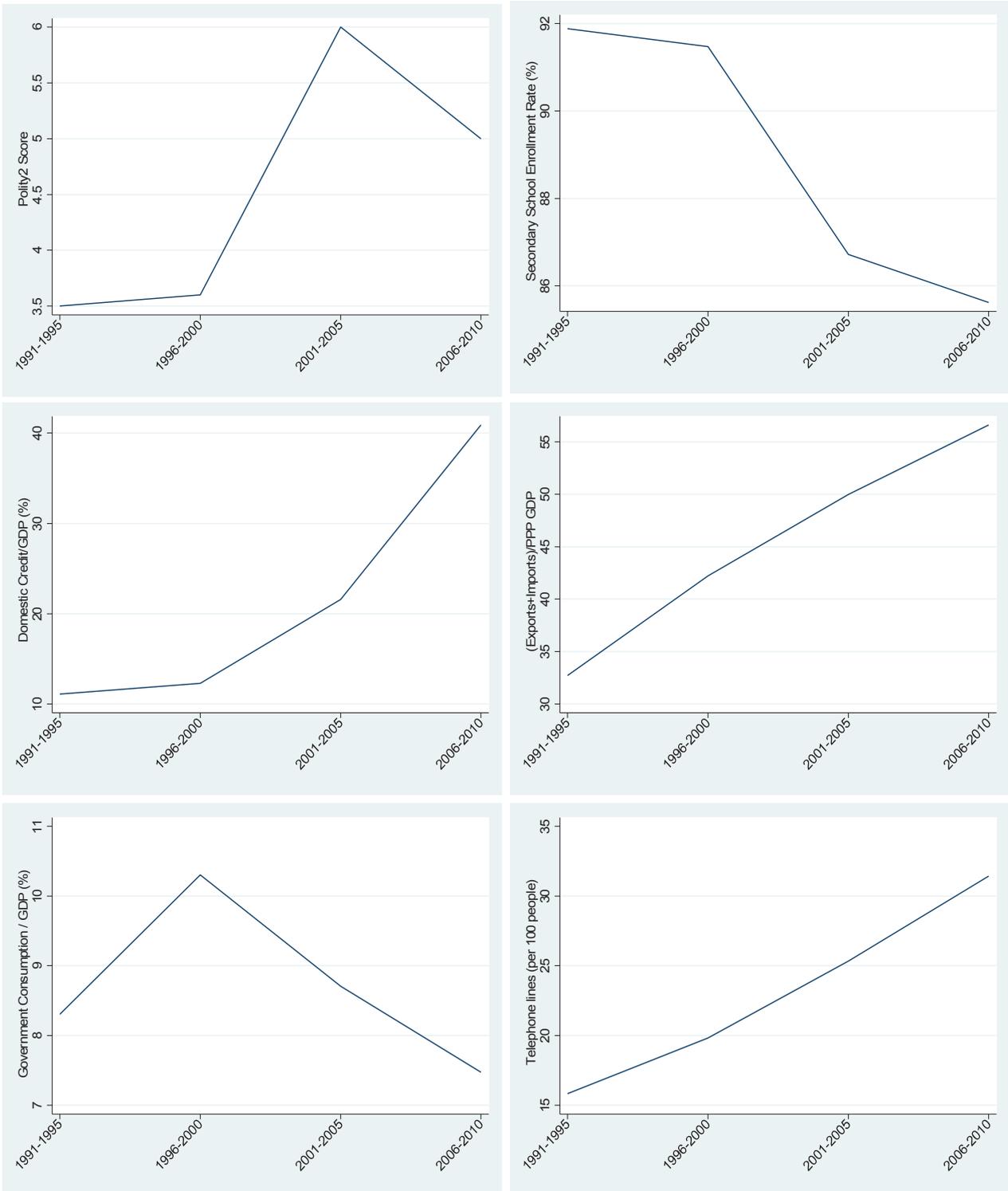


Figure 1C. Stabilization Policies and External Conditions
(Russia, 1991-2010)

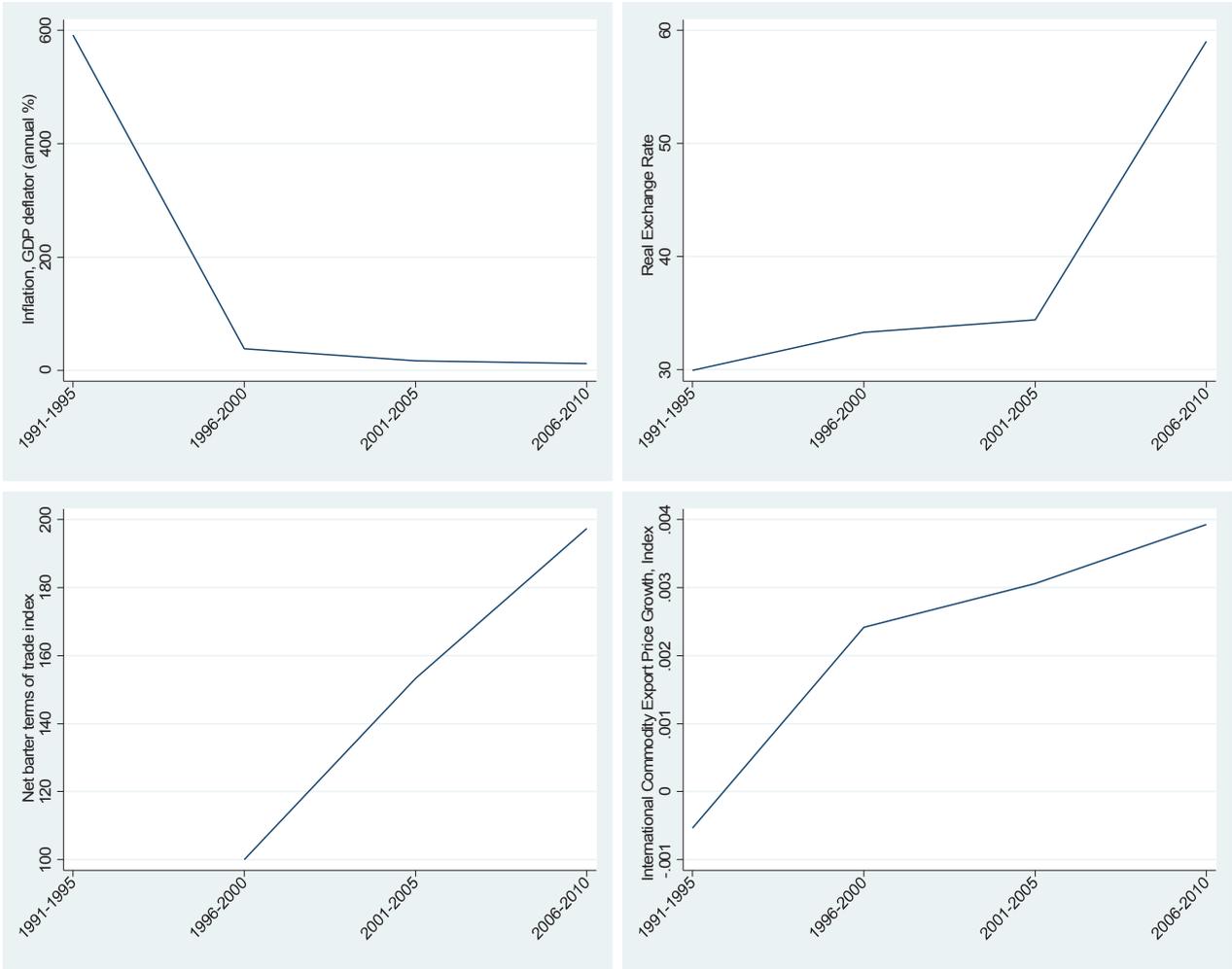


Figure 2. Bar Plot of Estimated Coefficients Reported in Column (1) of Table 5 Multiplied With Standard Deviations



Figure 3. Explaining Changes in Log GDP p.c. between 1996-2000 and 2006-2010 (Russia)

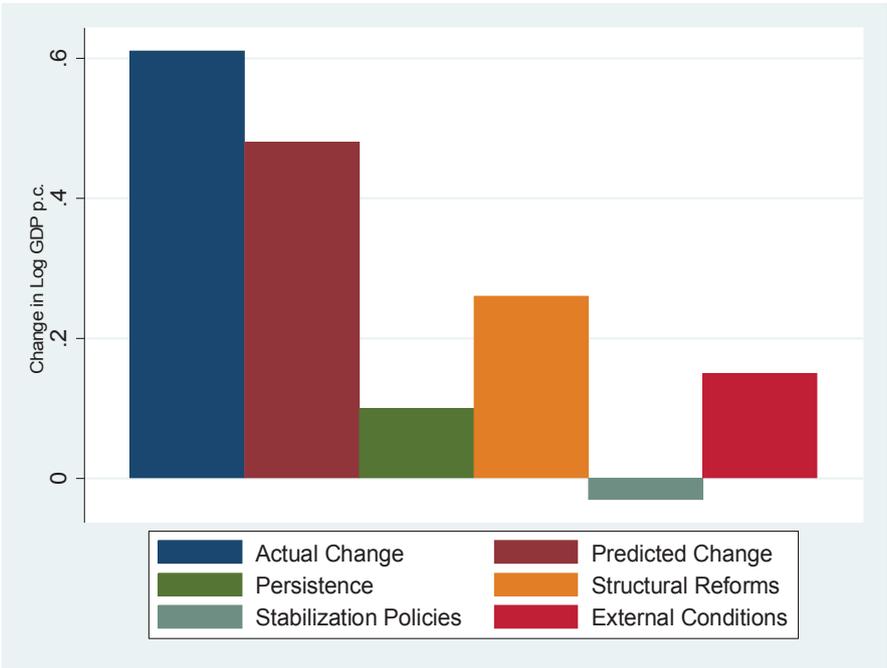


Figure 4. Contribution of Structural Policies to Changes in Log GDP p.c. between 1996-2000 and 2006-2010 (Russia)

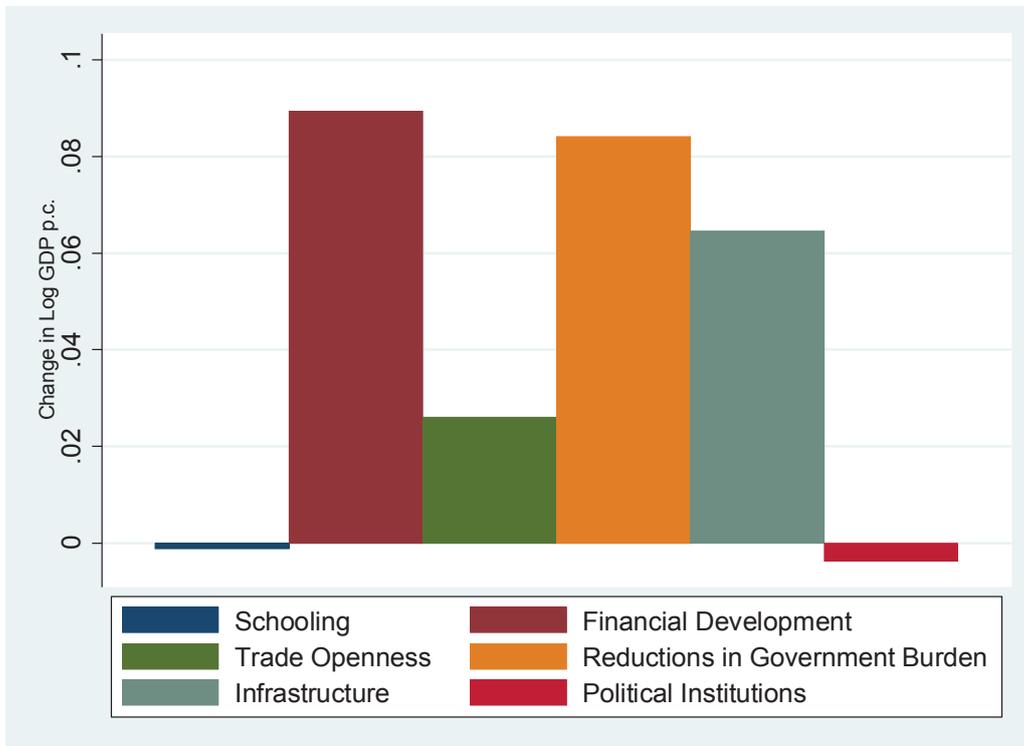


Figure 5. Changes in Log GDP p.c. due to Structural Reforms and Stabilization Policies between 1996-2000 and 2006-2010 (ECA Countries)

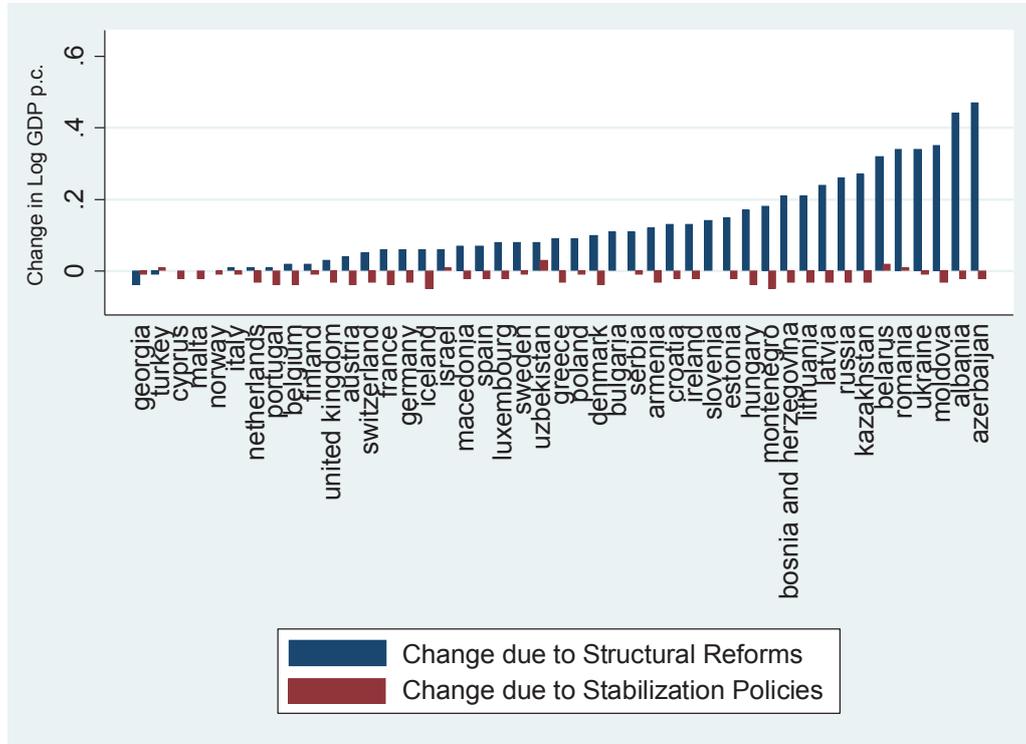


Figure 6. Actual Changes in Log GDP p.c. between 1996-2000 and 2006-2010 (ECA Countries)

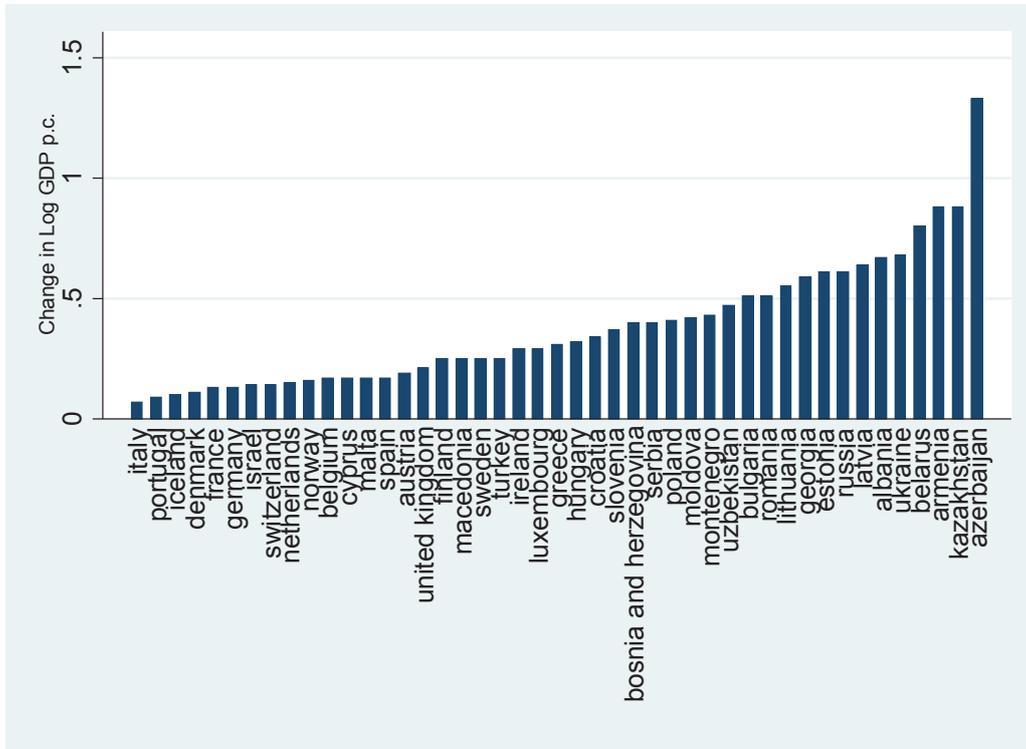


Figure 7. Changes in Log GDP p.c. due to Changes in External Conditions Between 1996-2000 and 2006-2010

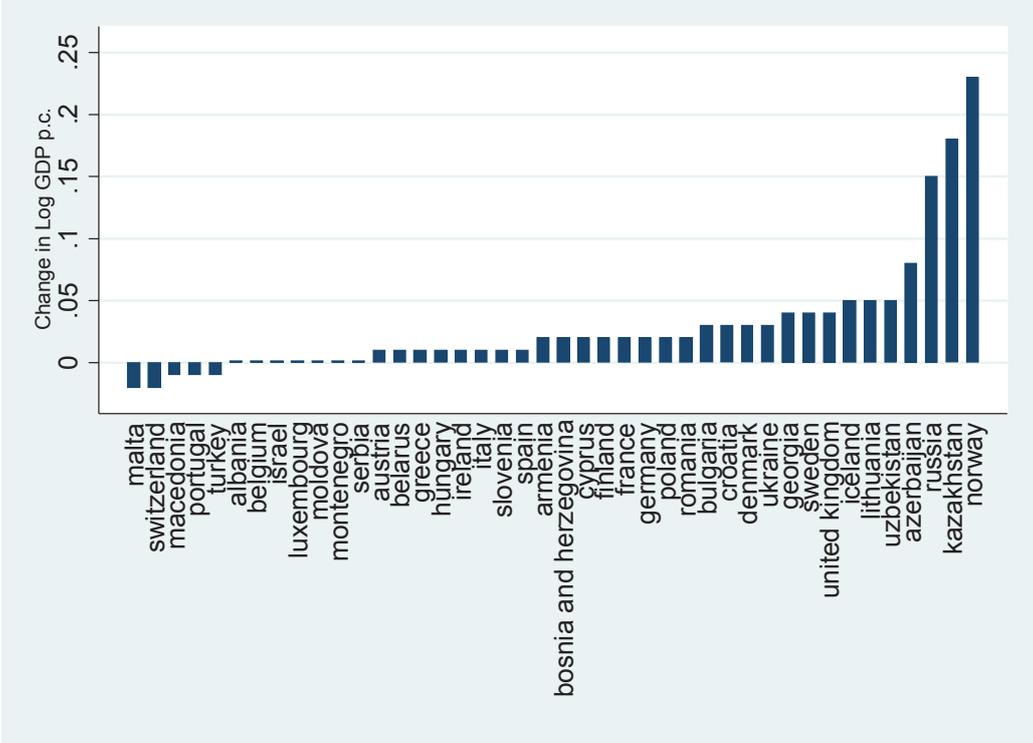


Figure 8. Contribution to Changes in Log GDP p.c. between 1996-2000 and 2006-2010 of Persistence, Structural Reforms, Stabilization Policies, and External Conditions (Selected Oil Exporting ECA Countries)

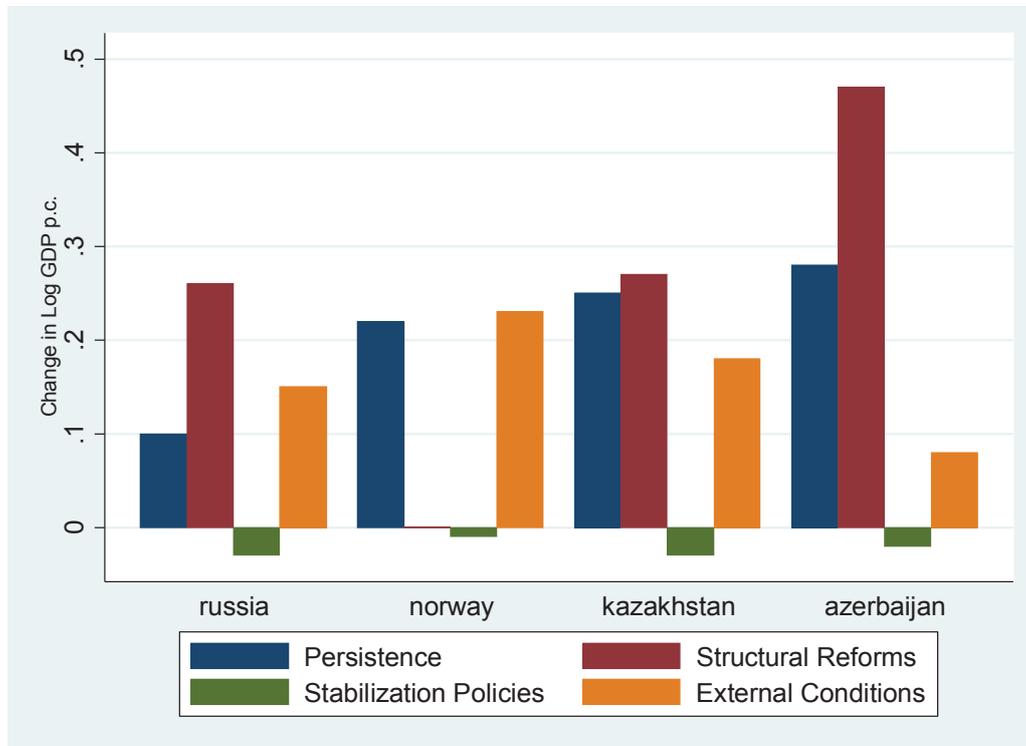


Figure 9. Contribution to Changes in Log GDP p.c. between 1996-2000 and 2006-2010 of Persistence, Structural Reforms, Stabilization Policies, and External Conditions (Oil Exporting vs. Oil Importing ECA Countries)

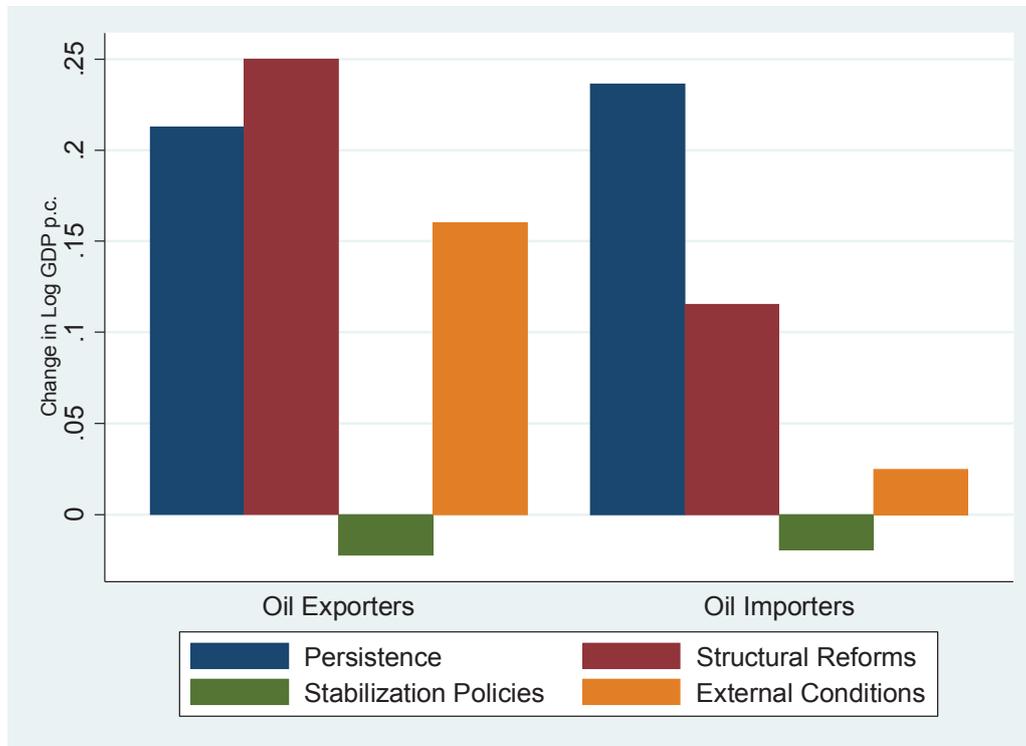


Figure 10. Contribution to Changes in Log GDP p.c. between 1996-2000 and 2006-2010 of Persistence, Structural Reforms, Stabilization Policies, and External Conditions (Developing vs. Developed ECA Countries)

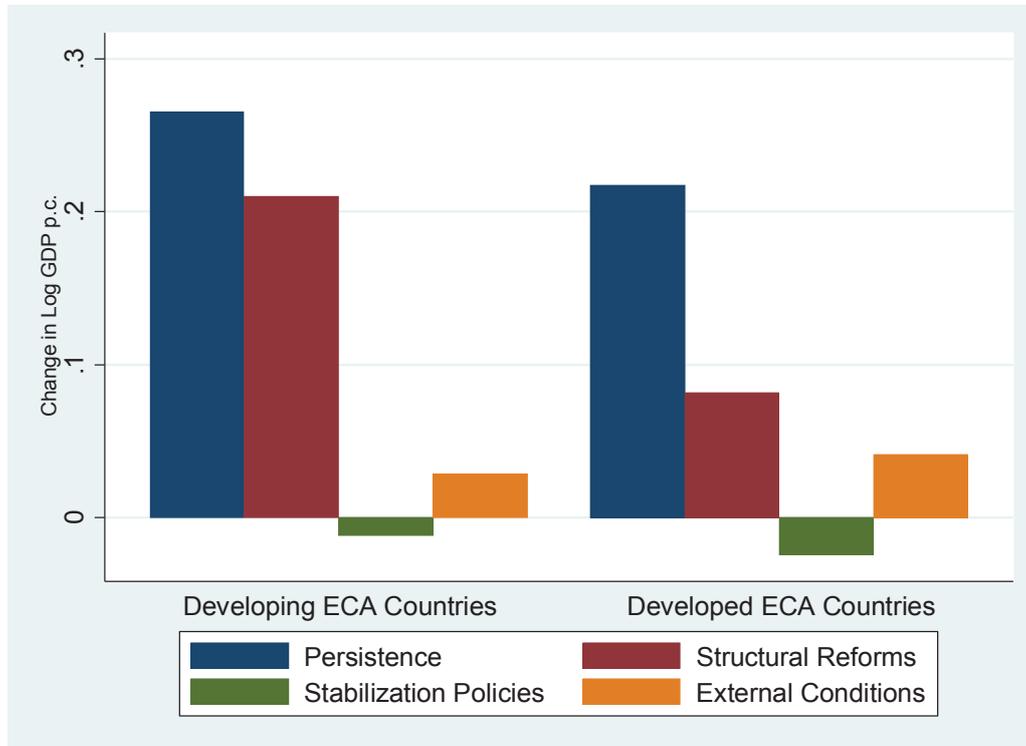


Figure 11. Contribution to Changes in Log GDP p.c. between 1996-2000 and 2006-2010 of Persistence, Structural Reforms, Stabilization Policies, and External Conditions (Former Soviet Union vs. Former Non-Soviet Union Countries)

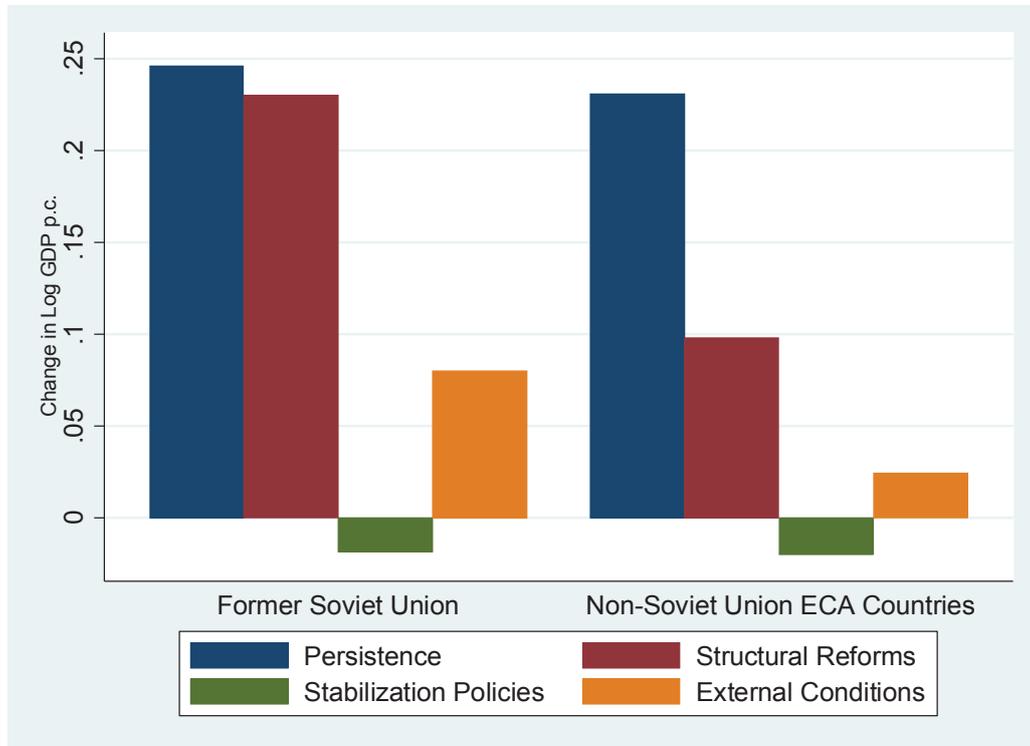


Figure 12. Contribution to Changes in Log GDP p.c. between 1996-2000 and 2006-2010 of Persistence, Structural Reforms, Stabilization Policies, and External Conditions (EU11 and EU Accession Countries)

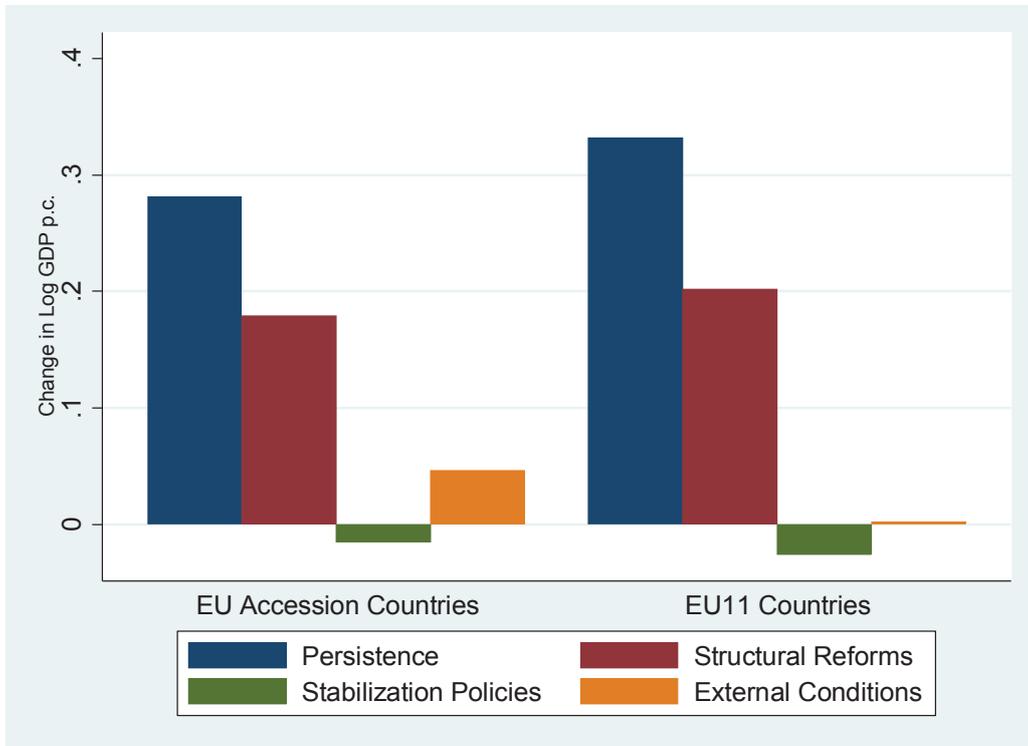


Figure 13. Changes in Log GDP p.c. between 1996-2000 and 2006-2010:
BRICS and Mexico

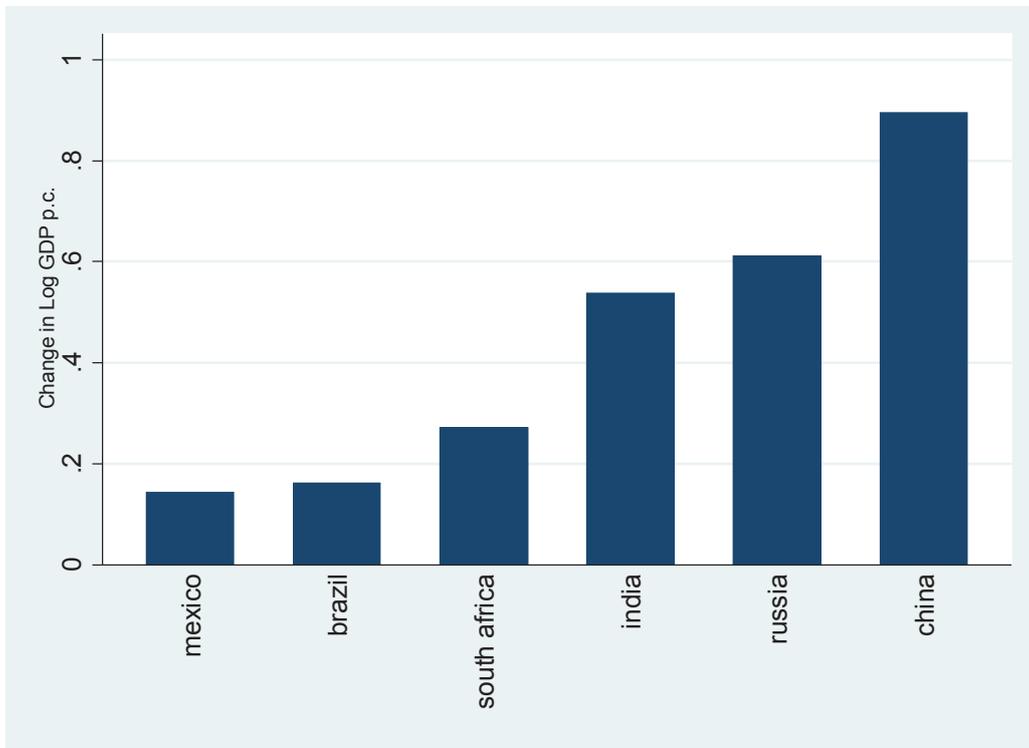


Figure 14A. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Structural Reforms: BRICS and Mexico

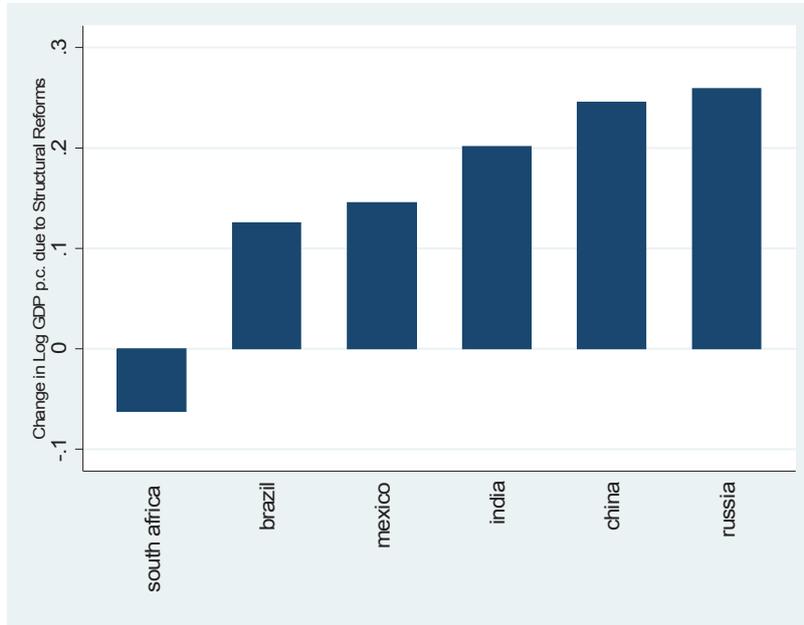


Figure 14B. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Stabilization Policies: BRICS and Mexico

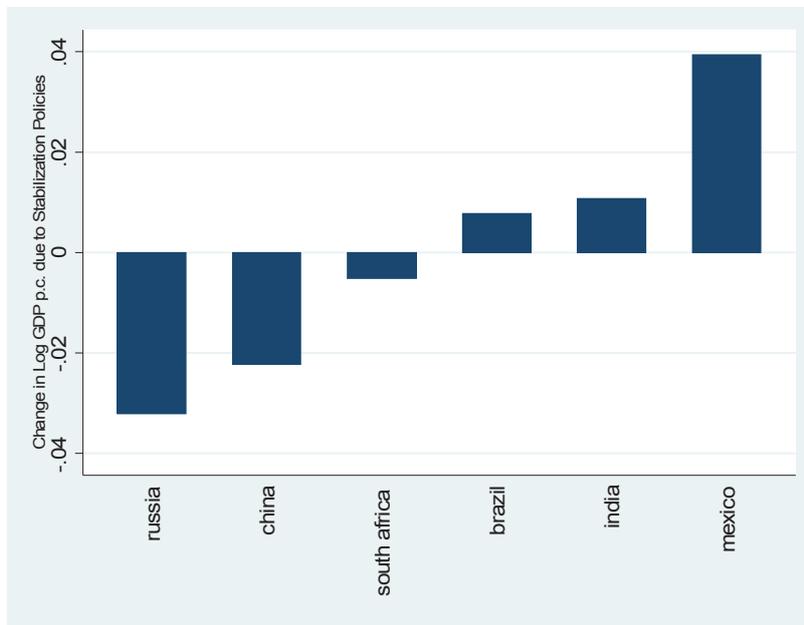


Figure 14C. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Changes in External Conditions: BRICS and Mexico

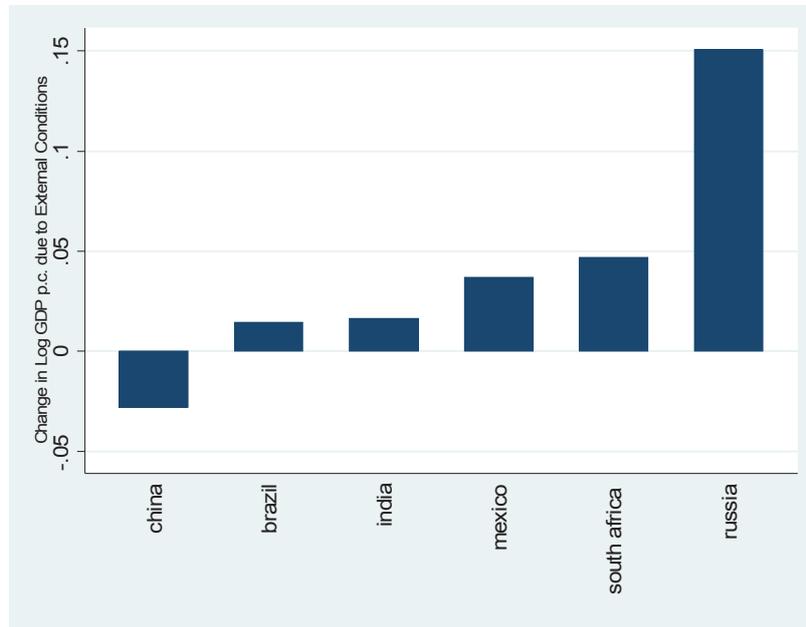


Figure 14D. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Transitional Convergence (Persistence): BRICS and Mexico

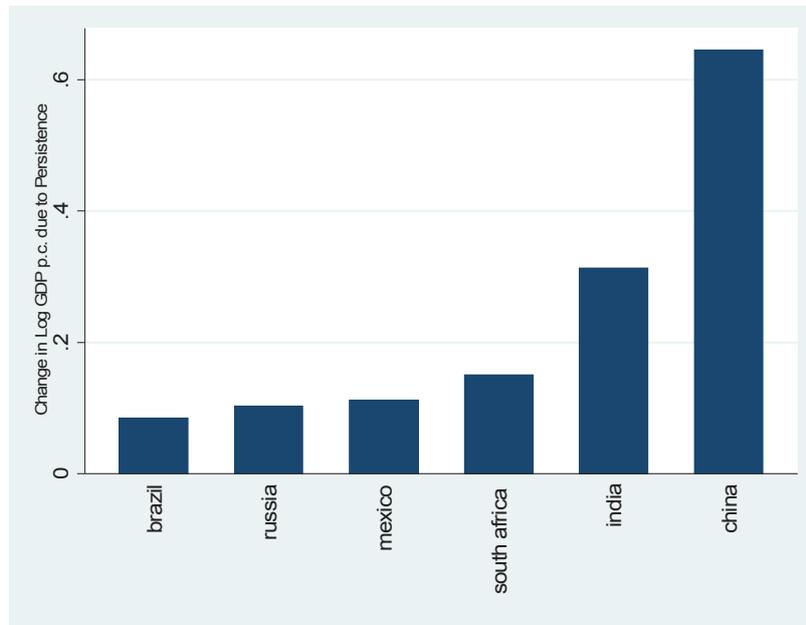


Figure 15. Changes in Log GDP p.c. between 1996-2000 and 2006-2010
Advanced Natural Resource Exporting Countries

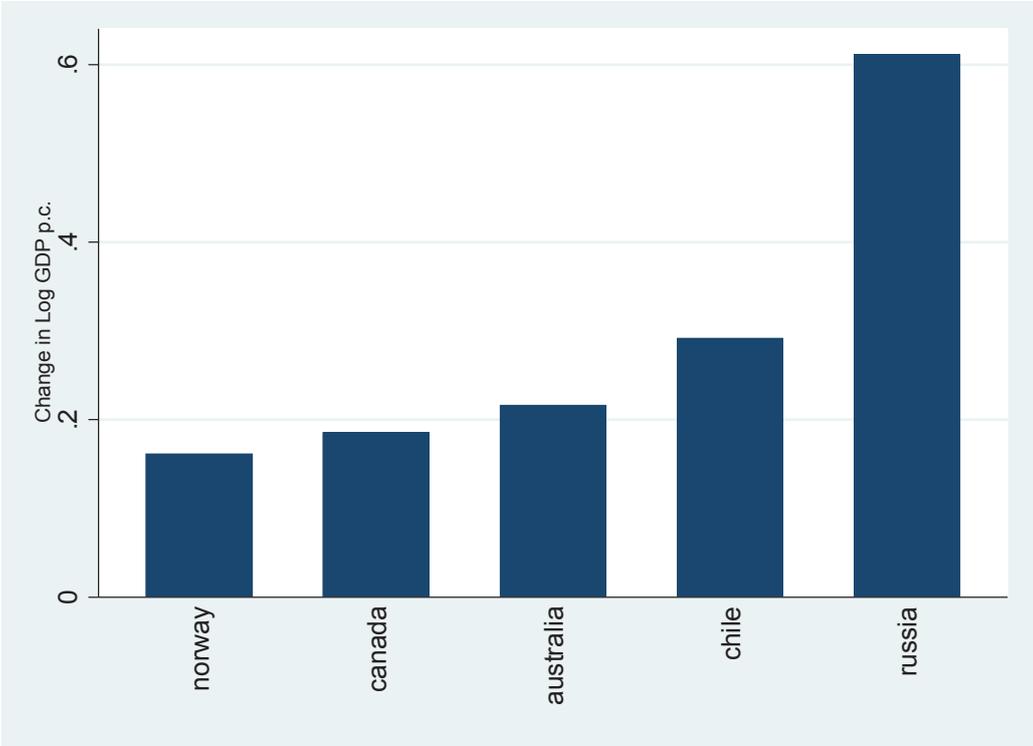


Figure 16A. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Structural Reforms:
Advanced Natural Resource Exporting Countries

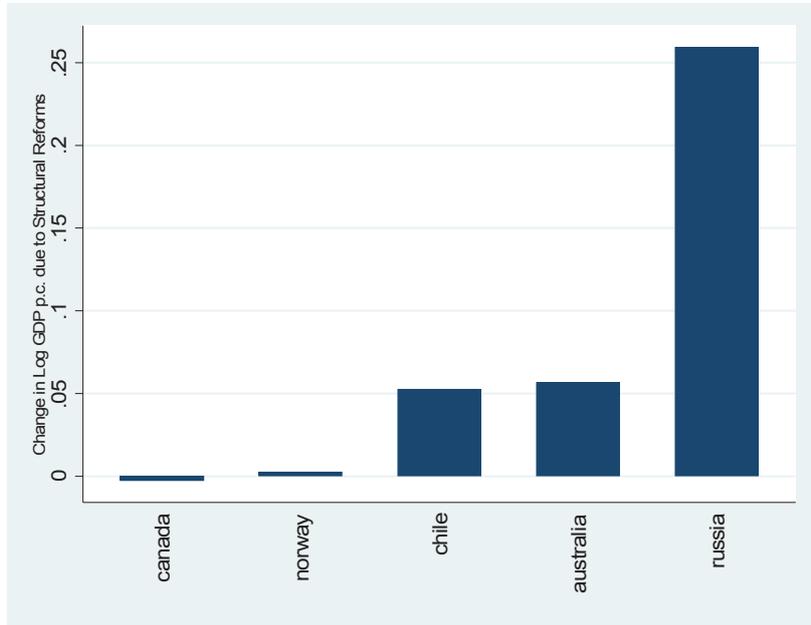


Figure 16B. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Stabilization Policies:
Advanced Natural Resource Exporting Countries

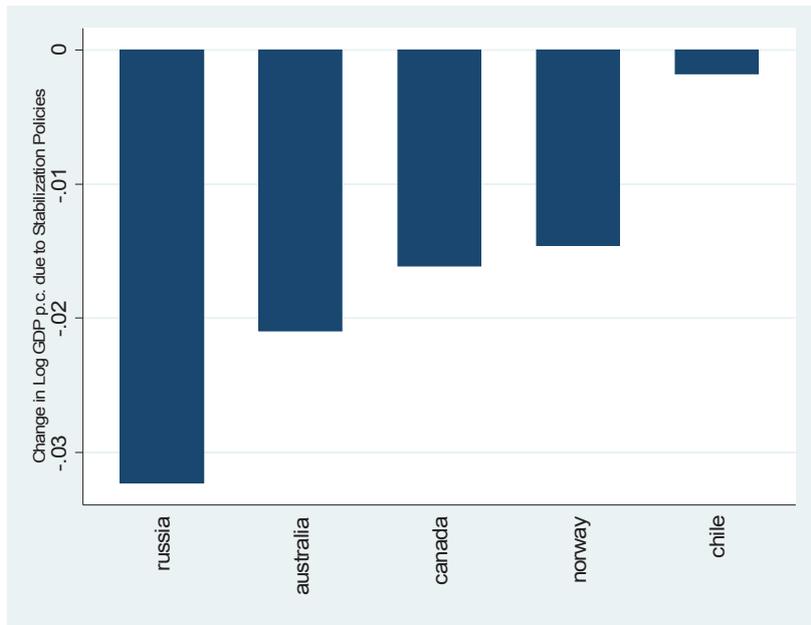


Figure 16C. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Changes in External Advanced Natural Resource Exporting Countries

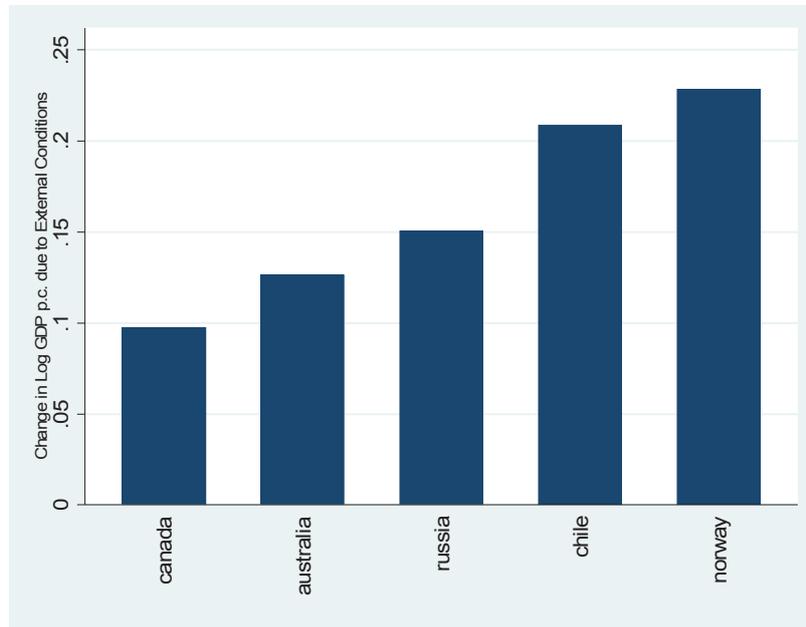


Figure 16D. Changes in Log GDP p.c. between 1996-2000 and 2006-2010 due to Transitional Convergence (Persistence): Advanced Natural Resource Exporting Countries

