Russian Federation
From Transition to Development
A Country Economic Memorandum for the Russian Federation
March, 2005
Currency and Equivalent Units
(Exchange Rate as of December 01, 2003)
Currency Unit = RUBLE
USD1.00 = 29.7387 rubles

Fiscal Year
January 1 to December 31

Weights and Measures
Metric System

ACRONYMS AND ABBREVIATIONS
AIDS Acquired immune deficiency syndrome
CBR Central Bank of Russia
CEA Center for Economic Analysis
CEFR Center for Economic and Financial Research
CEM Country Economic Memorandum
CPI Consumer price index
ECU European currency unit
EU European Union
FDI Foreign direct investment
FGI Financial-industrial group
FSU Former Soviet Union
GDP Gross domestic product
GE General Electric
GKO Government short-term Bills (Gosudarstvennye kratekoierochnye oboroznotnaya)
GM General Motors
HIV Human immunodeficiency virus
ILD International Labor Organization
IMF International Monetary Fund
LCU Local currency unit
LFS Labor Force Survey
LRMC Long-run marginal cost
MEDT Ministry of Economic Development and Trade
MFN Most favored nation
OECD Organization for Economic Cooperation and Development
OLS Ordinary least squares
PPP Purchasing power parity
RAJ-UES Unified Energy System
REB Russian economic barometer
REER Real effective exchange rate
RLMS Russian Longitudinal Monitoring Survey
SME Small and medium-size enterprise
TB Tuberculosis
TPC Temperature per capita
VAT Value added tax
WTO World Trade Organization

Vice President: Shigeo Katu
Country Director: Kristalina Georgieva
Sector Director: Cheryl W. Gray
Sector Manager: Asad Alam
Task Team Leader: Chritsod Righi
EXECUTIVE SUMMARY ............................................................................................................. i
A.  INTRODUCTION .................................................................................................................. 1
B.  GROWTH AFTER THE CRISIS: MACROECONOMIC FACTORS ........................................ 5
   (a)  Growth after the crisis ............................................................................................................. 5
   (b)  The role of oil price changes ................................................................................................. 8
   (c)  The role of relative price adjustments, and economic policy ............................................... 12
   (d)  The role of real wages, or why did output not collapse? ....................................................... 12
   (e)  Summary ................................................................................................................................ 15
C1.  SPATIAL REALLOCATION ................................................................................................. 18
   (a)  “Natural” demographic development .................................................................................... 18
   (b)  International migration ........................................................................................................... 19
   (c)  Internal migration .................................................................................................................. 21
   (d)  Summary and policy implications ......................................................................................... 35
C2.  SECTORAL REALLOCATION .............................................................................................. 38
   (a)  Benchmarking Russia ............................................................................................................. 38
   (b)  Structural change across Russia’s regions ............................................................................. 43
   (c)  Sectoral change across regions: Russia and the United States compared ................. 51
   (d)  Summary and policy implications ......................................................................................... 55
C3.  COMPOSITION OF PRODUCTIVITY CHANGES .................................................................. 59
   (a)  Adjusting Russia’s value added ............................................................................................. 59
   (b)  Development of productivity across sectors ....................................................................... 64
   (c)  Separating oil and gas, and finance ..................................................................................... 66
   (d)  Decomposition of productivity growth in Russia ............................................................... 70
   (e)  Summary and policy implications ......................................................................................... 72
C4.  ENTERPRISE SIZE AND MARKET CONCENTRATION .................................................... 77
   (a)  Establishments and firms ....................................................................................................... 77
   (b)  Employment and the size distribution of establishments .................................................... 78
   (c)  Local agglomeration ............................................................................................................. 82
   (d)  Enterprise consolidation and market structure .................................................................... 83
   (e)  Summary and policy implications ......................................................................................... 87
C5.  OWNERSHIP AND CONTROL ............................................................................................ 89
   (a)  Concentration on the firm level and the national level ....................................................... 89
   (b)  Survey methodology and sample construction ................................................................. 91
   (c)  Determining the “ultimate owners” ..................................................................................... 94
   (d)  The degree of concentration in Russia’s economy ............................................................ 97
   (e)  Control and enterprise performance .................................................................................... 106
   (f)  Enterprise performance ....................................................................................................... 107
   (g)  State capture in Russia’s regions ......................................................................................... 110
   (h)  Who receives preferential treatment? .................................................................................. 112
   (i)  Do the ownership interests of captors impact non-captor firms? ........................................ 115
   (j)  Summary ............................................................................................................................ 117
D.  CONCLUSION ....................................................................................................................... 122
E.  REFERENCES .......................................................................................................................... 124
F.  ANNEX.................................................................................................................................... 127

Table B.1 Changes in investment and capacity utilization after the crisis ................................... 7
Table B.2 Decomposition of GDP growth rate in 2003 ................................................................ 11
Table C1.1 Annual Average Percentage Growth Rates of Cities in Soviet and Transition Periods .... 29
Table C1.2 Changes in the urban population of Russia by Federal District, 1989-2003 ............ 31
Table C2.1 Levels, Shares and Growth Rates of Employment 1990-2002 by Sector ..................39
Table C2.2 Cross-Section Regressions ..................................................................................58
Table C3.1 Trade Margins in 2000: Russia and Canada ...........................................................61
Table C3.2 GDP in 2000 by Sector of Origin: Published GDP vs. Adjusted using Canadian Trade Margins (million rubles) ..........................................................................................62
Table C3.3 GDP in 2000 in Russia by Broad Sector of Origin: Published GDP vs. Adjusted using Distribution Margins from Selected Countries ..........................................................63
Table C3.4(a) Productivity Growth Decomposition: 1990-1996 ..............................................75
Table C3.4(b) Productivity Growth Decomposition: 1996-2002 ..............................................76
Table C4.1 Distribution of establishment size and employment growth 2001-02 ......................78
Table C4.2 Employment levels and growth by sector, 2001-02 ..............................................79
Table C4.3 Employment by size of establishment, 2002 ......................................................80
Table C5.1 Sectoral and Sample Coverage ...........................................................................93
Table C5.2 Large private owners, managing total sales of R1.7 trillion rubles and 1.4 million employees .............................................................................................................................96
Table C5.3 Control of Broad Sectors by Share of Sales, Employment and Assets .................100
Table C5.4 Does group size matter? (unconditional means) ..................................................112
Table C5.5 Does control over other firms matter? (unconditional means) ..............................113
Table C5.6 Does ultimate ownership matter? (unconditional means) ....................................114
Table C5.7 Does the design of privatization matter? (unconditional means) .........................114
Table C5.8 Captured regions (1996-2000) ...........................................................................116
Table F.1 Firms controlled by the group of largest owners didn’t perform better than independent private owners in both 2001 and 2002 .................................................................127
Table F.2 Firms controlled by the group of largest owners outperform other Russian owners in terms of productivity growth .........................................................................................128
Table F.3 Regional distribution of firms in the sample ............................................................129
Table F.4 Distribution of firms in the sample by industry .......................................................130
Table F.5 OLS, between effects. Who receives preferential treatment? .................................131
Table F.6 OLS, between effects: Effects of capture by federally active FIGs on non-captor firms ..........................................................132
Table F.7 Between effects: Effect of capture by firms in loans-for-shares groups on non-captor firms ..............................................................................................................................133

Figure B.1(a) Composition of GDP 1990-2002 at Adjusted 2000 Prices: Broad Sectors ........6
Figure B.1(b) Composition of Employment 1990-2002: Broad Sectors .................................6
Figure B.2 Growth Rates in Manufacturing and Resource Based Industries .......................10
Figure B.3(a) Hourly Wages and Productivity .......................................................................13
Figure B.3(b) Real Wages and GDP ....................................................................................13
Figure B.4 Relative Price Dynamics, July 1998=100 ................................................................15
Figure C1.1 Russia: Net Migration and Natural Increase, 1980-2002 .............................18
Figure C1.2(a) Net Migration by Age for Russia, 1997-2002 ..............................................21
Figure C1.2(b) Net Migration by Level of Education, 2002 (persons 14 and older) ..............21
Figure C1.3(a) Inter-Census Population Change, January 12, 1989 to October 9, 2002 .......22
Figure C1.3(b) Net Migration by Region in Russia, 1989 to 2002 ........................................22
Figure C1.4 Growth of Large Cities in Russia Since 1959 ..................................................24
Figure C1.5(a) Size Distribution US ....................................................................................26
Figure C1.5(b) Size Distribution France ...............................................................................26
Figure C1.5(c) Size Distribution Poland ...............................................................................26
Figure C1.5(d) Size Distribution China .................................................................................26
Figure C1.6 Size Distribution of Russian Cities ....................................................................27
Figure C1.7 Unexplained City Growth in Russia ..................................................................30
Figure C1.8 Net Migration in Urban and Rural Areas, 1989 to 2001 (thousands) ....................... 32
Figure C1.9 Population Change in Urban and Rural Areas in Russia, 1989 to 2001 ................... 32
Figure C1.10 Net Migration in and out of the Russian North, 1979-2000 ................................. 34
Figure C2.1(a) Agriculture – Russia vs. Market Economies .................................................. 40
Figure C2.1(b) Industry – Russia vs Market Economies ......................................................... 41
Figure C2.1(c) Market Services – Russia vs. Market Economies ............................................. 42
Figure C2.1(d) Non-market services – Russia vs market economies ....................................... 42
Figure C2.2(a) Benchmarking Agriculture: Russia’s regions in 1990 ........................................ 46
Figure C2.2(b) Benchmarking Agriculture: Russia’s Regions in 2001 ....................................... 47
Figure C2.3(a) Benchmarking Industry: Russia’s Regions in 1990 .......................................... 47
Figure C2.3(b) Benchmarking Industry: Russia’s Regions in 2001 .......................................... 48
Figure C2.4(a) Benchmarking Market Services: Russia’s Regions in 1990 ............................... 49
Figure C2.4(b) Benchmarking Market Services: Russia’s Regions in 2001 ............................... 49
Figure C2.5(a) Benchmarking Non-market Services: Russia’s Regions in 1990 ....................... 50
Figure C2.5(b) Benchmarking Non-market Services: Russia’s Regions in 2001 ...................... 51
Figure C2.6(a) Changes in Regional Dissimilarity: Russia 1990-2001 ..................................... 52
Figure C2.6(b) Changes in Regional Dissimilarity: United States 1969-2000 ........................... 52
Figure C2.7 Annual Regional Distance Traveled ...................................................................... 53
Figure C2.8 Cumulative Regional Distance Traveled ............................................................... 54
Figure C3.1 Labor Productivity 1990-2002: Broad Sectors ....................................................... 64
Figure C3.2 Labor Productivity 1990-2002: Broad Sectors ....................................................... 66
Figure C3.3 Employment 1990-2002: Broad Sectors ............................................................... 66
Figure C3.4(a) Real GDP 1990-2002: Industry, Oil & Gas ....................................................... 68
Figure C3.4(b) Employment 1990-2002: Industry, Oil & Gas ................................................... 68
Figure C3.4(c) Labor Productivity 1990-2002: Industry, Oil & Gas ........................................ 69
Figure C3.5 Labor Productivity 1990-2002: Oil & Gas, Finance ............................................... 69
Figure C4.1 Job Flow Rates in Russian Manufacturing ............................................................. 81
Figure C4.2 Decomposition of Establishment Growth .............................................................. 81
Figure C4.3 The Distribution of Establishment Size in Mining and Manufacturing: Russia and the US Compared .......................................................... 84
Figure C4.4 The Distribution of Firm Size in Manufacturing: Russia and the US Compared ....... 84
Figure C4.5(a) Concentration and Market Size 1991 ............................................................... 86
Figure C4.5(b) Concentration and Market Size 2001 ............................................................... 86
Figure C5.1 Sample Composition by Employment and by Sales ........................................... 98
Figure C5.2 Surveyed firms as a share of all firms in industry (32 sub-sectors) by employment and by sales .......................................................... 99
Figure C5.3(a) and (b) Ownership Concentration by Employment ........................................ 102
Figure C5.4(a) and (b) Concentration of Employment Ranked by Other Owners’ Share .......... 103
Figure C5.5(a) Russian Big Business Share of Sales ............................................................... 104
Figure C5.5(b) Other Owners’ Share of Sales .......................................................................... 105
Figure C5.6 Size Distribution of largest Owners in Industry (32 Sectors) ............................... 106
Figure F.1 Average number of preferential treatments per firm in the sample ................. 130

Box 1. Bank assistance for adjustment of settlement patterns ............................................. 34
Box 2 Ownership and Control ......................................................................................... 109
ACKNOWLEDGMENTS

This Country Economic Memorandum is based on the findings of research that was carried out between May and December 2003 and included two workshops and several visits to Russia's regions by World Bank staff based in Moscow. It analyzes the relationship between growth and structural change in the Russian Federation, and its findings are based on a number of background studies, several of which will be published, as cited in the text. This report was led and prepared by Christof Rühl.

The core team included the following World Bank staff: Olga Antimonova (data management, editing), Vladimir Drebentsov (enterprise restructuring and ownership data, editing, general editing of Russian version), Alexander Morozov (macroeconomics, editing), Stepan Titov (regional visits, editing), and Sergei Ulatov (macroeconomics, editing). In addition, the team included the following consultants: Geoffrey Wyatt (Heriot-Watt University, Edinburgh) and Timothy Heleniak (UNICEF, Florence) on the spatial allocation of people and production in Russia (Chapter C1); Mark Schaffer (Centre for Economic Reform and Transformation [CERT], Heriot-Watt University and Centre for Economic Policy Research [CEPR], London) and David Brown (CERT, CEPR and Center for Economic and Financial Research [CEFIR], Moscow) on the allocation of employment across sectors, the composition of productivity changes, and the relationship between enterprise size and market concentration (Chapters C2-C4); Sergei Guriev, Andrei Rachinsky, Yevgeny Yakovlev, and Ekaterina Zhuravskaya on concentration of ownership and control and its consequences (Chapter C5); Dmitri Butrin (Kommersant, Moscow), Pavel Kuznetsov (Center for Economic Reforms of the Government of the Russian Federation, Moscow), Alexei Sokolov (IMEMO), Anna Shabunina (NES and CERT, Heriot-Watt University), William Flemming (Moscow Times, Moscow), Olga Proskumina (Gazeta, Moscow), and Renata Yambaeva (Kommersant, Moscow) – on collecting and maintaining the database on firm ownership and concentration. Ben Hoosen and World Bank staff Anna Bazanova, Tatyana Alexandrova, Sergei Karakin, Artem Kolesnikov, and Marina Paradzinskaaya contributed to the formatting and editing of the report. The work was carried out under the general direction of Deborah Wetzel, Sector Manager (ECSPE) and Julian Schweitzer, Country Director for Russia.

We are grateful for comments from the following peer reviewers: Boris Kuznetsov (Interdepartmental Analytical Center), Ira Lieberman (World Bank and Open Society Foundation), John Litwack (World Bank), and Angana Banerji (IMF).

The team would also like to thank Maria Amelina, Kakha Bendukidze, Richard Clifford, Jackie Coolidge, Berry Eichengreen, Peter Fischer, Lev Freinkman, Evgeni Gavril'kov, Cheryl Gray, Agnieszka Grudzinska, Evsei Gurvich, Andrei Illarionov, Andrew Jack, Andrei Klepach, Axel Leijonhufvud, Johannes Linn, Pradeep Mitra, Yakov Pappe, Neil Parison, Paula Perttunen, Victor Polterovich, Julian Schweitzer, Ken Sokoloff, Paul Thomsen, Lee Travers, Al Watkins, Andrei Yakovlev, Evgenyi Yasim, Ksenia Yudaeva, and the participants in the seminar at the Higher School of Economics and the Carnegie Foundation for their most useful comments.

In addition, we would like to express our sincere gratitude for help in compiling the database on firm ownership and concentration to Mr. Richard Hainsworth, the CEO of RusRating, Moscow, and to Mr. Ulf Schneider, the Managing Director of Russia Consulting, Moscow, for their support with data and information on the banking and the insurance sectors, respectively.
EXECUTIVE SUMMARY

Russia found itself in an excellent position at the beginning of 2004. The economy grew by a cumulative 38 percent in the five years between the 1998 financial meltdown and the end of 2003, and growth shows no signs of abating. Inflation has gradually declined, reaching 12 percent in 2003. The macro-accounts are all in the black, with the federal budget running a surplus in 2003 for the fourth year in a row and another surplus forecast for fiscal 2004. The current account surplus was 11 percent in 2003, and reserves hit record highs of US$86 billion by February 2004. The President of the Russian Federation has recently declared the objective to double GDP in ten years, and the government’s current medium-term Strategy for Social and Economic Development aims at diversifying the economy away from natural-resource production, in order to limit the risks to long-term growth from dependence on international energy prices.

The purpose of this Country Economic Memorandum (CEM) is to assess the extent of structural change in the Russian Federation, and its contribution to long-term growth - a prerequisite for meeting the government’s ambitious economic objectives. The report starts with the hypothesis that Russia’s economy is still “in transition,” with further scope to boost growth by reallocating existing resources and restructuring existing production processes. Structural change therefore is a powerful determinant of Russia’s medium-term growth and long-term prospects. Of course, there are other contributors to growth. Most notable is the role that high hydrocarbon prices have played in Russia’s rapid recovery from the 1998 crisis. In order to separate the role of structural change from other growth determinants as clearly as possible (without denying mutual influences and feedback loops), Part B of the report analyzes the determinants of growth, other than structural change, that have been important in Russia since the crisis.

Post-crisis recovery

Excluding structural change, the impressive rebound since 1998 is due to four broad factors:

- External factors, such as price increases for Russia’s main commodity exports.
- Endogenous adjustments triggered by the 1998 crisis, mostly relative price adjustments such as a massive real exchange rate devaluation, and real wage decline.
- Changes in the behavior of economic agents (including economic policy makers).
- Underutilized productive capacity of capital and labor, arising from the years of decline before 1998, and then from the crisis itself. Use of this productive capacity was very important in the early post-crisis years in Russia but had run its course by mid-2002.

Part B discusses these different growth determinants. Given ample spare capacity, perhaps the longest-lasting growth determinant has been commodity price increases. Russia has never grown more rapidly than 5 percent without a simultaneous increase in the price of oil. We estimate that trend output growth in Russia (i.e., the rate of growth with a constant oil price) currently is around 4.5-5 percent, and rising, as investment expands and production capacity increases outside the oil and gas sectors. Despite current trends, increasing oil prices must obviously be treated as a transitory phenomenon.

The second group of post-crisis growth determinants – endogenous price changes – was important to kick-start production after the 1998 crisis. The collapse in the real exchange rate resulted in import substitution. The real exchange rate is not yet back to the 1998 level, but is subject to considerable upward pressure as both oil prices and export volumes increase. Another important relative price adjustment concerns real wages, which bore the brunt of the adjustment
after 1998, falling by more than 30 percent. Since then, they have risen faster than GDP growth, moving towards their pre-crisis levels, with wage/profit shares similar to those prevalent before the crisis. Finally, interest rates have come down from previous exorbitant levels and are no longer diverting private investment flows into unproductive government expenditures. Provided that current policies stay in effect, the crowding out of the private sector is a thing of the past. However, real wage rates are approaching pre-crisis levels and upward pressures on the real exchange rate will require difficult policy interventions.

In terms of how these effects may play out in the future, Part B concludes that the gains from increases in capacity utilization and the benefits from low real wages have effectively run their course. With the appreciation of the real exchange rate, the positive impact of exchange rate depreciation has also been mostly utilized. Oil prices, while currently quite strong, are inherently volatile and therefore imply some degree of uncertainty. The government’s ability to maintain surpluses and prevent the crowding out of the private sector will remain an important underpinning for future growth. Finally, the under-pricing of gas and electricity to key parts of the economy, while helping to boost certain sectors in the short run will ultimately have a negative impact on the energy intensity and therefore the competitiveness of the economy.

**Structural change**

Part C of the report turns to an analysis of changes to the structure of Russia’s economy during the years of high growth. This section studies in turn five connected dimensions of structural change:

- The need for spatial reallocation caused by the legacy of industrialization and urbanization under central planning. Subsidization of this legacy imposes costs on viable segments of the economy.
- The reallocation of employment across the economy’s main sectors, especially from industry to services, which is important not only in correcting the bias of central planning toward industrial production, but also in determining spatial adjustment.
- The question of whether productivity changes, key to growth, originate from these shifts of employment across sectors or from restructuring within sectors.
- The key determinants of restructuring in the industrial sector, given that it is more likely to lead to high productivity changes.
- The concentration of ownership and its implications for industrial restructuring and economic performance.

The analysis suggests the following:

1) **Demographics and international migration are insufficient to explain the massive relocation of people currently under way in Russia. Individuals are following employment opportunities, and this suggests that the relocation of the population can be expected to continue.**

Section C1 discusses two separate dimensions of spatial reallocation: demographic changes and international migration triggered by the onset of transition, and internal migration trends. Cross-border migration has at least partially compensated for the dramatic population decline and outward migration losses suffered since 1991. However, international migration and the decline in the population alone do not account for the observed patterns of migration. There are large population shifts away from the cold Northern and Eastern regions that were urbanized under central planning. In addition, the urbanization pattern was so unusual that, if benchmarked, Russia today appears to be “missing” a sizable number of large cities (with more than 1 million inhabitants), and current internal population movements are still resulting in accelerated urbanization. Although urban agglomeration is likely to continue, it is impossible to determine a
priori where the new urban centers will develop. Consequently, migration incentives tied to particular regions or districts should be avoided. Although it is economically sensible to lower the transaction costs of moving, this needs to be done without assigning target areas to which people should go. People will relocate where there is economic opportunity.

2) Russia’s economic structure has made significant adjustments: the share of employment in industry has declined and the share in market services has increased. These sectoral shifts have considerable spatial implications and regions have become more diversified over time. However, there is a persistently low share of employment in agriculture and an exceptionally high share of employment in non-market services. The pace of structural change has slowed since 1998.

Section C2 benchmarks employment movements across sectors in Russia against market economies with comparable per capita incomes. Russia starts from a position, relative to the benchmark, where the share of employment in industry was much higher and that of market services much lower. Considerable adjustments toward the pattern of market economies have been recorded in these two market-driven sectors, although the process is far from completed. In contrast, there are problems in non-market sectors, or sectors such as agriculture, which are only now becoming subject to market interaction. Employment in agriculture remains comparatively low, while employment in non-market services (and public sector employment in general) is much higher than in comparator countries. Low agricultural employment can be traced to unrecorded economic activity on garden plots; high public sector employment reflects poor regions creating safety nets by hiring otherwise unemployed labor – and relying on transfer payments from the Federation to cover their public sector wage bills.

Using the sectoral composition of employment as its yardstick, the report shows that Russia’s regions have become more diversified over time. Latitude, transport infrastructure, and especially education, influence changes in the composition of regional employment toward proportions observed in other countries with a comparable per capita income. A comparison of the speed of sectoral adjustment with the United States shows that, although change in Russia remains more rapid, it has slowed down dramatically since the 1998 crisis. The sectoral structure of U.S. has become more unified over time while Russia’s regions are still in the process of becoming more diversified. However, Russia’s slowdown in sectoral adjustment reflects not only a slackening of reform but also the transition from a declining to a growing labor market, where employment opportunities are driving movements of labor, but more slowly than during the previous phase of job destruction.

The policy conclusions which emerge give center stage to the role of private new firm growth that can trigger employment shifts into new sectors. In general, this aspect of transition calls for policies that nurture the best-possible investment climate (in particular if one bears in mind that large-scale employment shifts in Russia are more costly than elsewhere, because they have to compensate for the transaction costs of spatial reallocation).

3) To understand the composition of productivity changes, it is critical to understand the impact of transfer pricing. With adjustments to take transfer pricing into account, industry becomes the largest component of GDP, with oil and gas comprising 20 percent and the trading sector significantly smaller. Restructuring within sectors, particularly industry, is a larger source of growth than restructuring between sectors, but much of the necessary restructuring lies ahead.

With respect to the immediate impact on growth, the question raised by this analysis concerns the productivity effects of the adjustment of employment away from industry. Has the observed increase in labor productivity in recent years originated in these employment shifts across
sectors, or has it been created largely by restructuring within particular sectors? And if so, in which sectors? Answering these questions requires consideration of the composition of GDP, the number of people working in different sectors, and the development of sector productivity over time. However, the report notes that the contribution of oil and gas (and, hence, industrial production) to GDP has been underestimated and the contribution of services overestimated because of the widespread use of transfer pricing. In section C3, the necessary adjustments in the national accounts are made. Recalculating the national accounts changes the composition of GDP: even under moderate assumptions, it more than doubles the share of oil and gas (to 20 percent), and re-instates industry as the largest component of GDP.

Using this reassessment of GDP composition, the analysis finds that restructuring within sectors, particularly industry, is still the biggest driver of growth in Russia. This is partly a function of the importance of the hydrocarbon sectors, but it is also a broader reflection of the ongoing and potential impact of industrial restructuring.

The adjusted productivity data show that labor productivity in the main sectors has adjusted to the ranking that is generally observed in market economies. Labor productivity is higher (and continues to improve) in industry, where capital intensity is comparatively high, whereas it is by now lower in market services. The decomposition of productivity gains shows that most of the recorded improvements originate from restructuring within industry. As expected, the oil and gas sector (in industry) and finance (in services) are positive outliers. Market services have made rapid employment gains, a trend that is only now becoming discernible in industry. In addition, detailed labor survey data show that the highest growth in job creation in Russia most recently took place in establishments of between 30 and 100 employees – small, but no longer micro-size facilities.

In general, labor productivity is increasing, but there are several important implications. The slow job creation in industry during Russia’s recovery to date points to the role that idle capacity played in restoring productivity after the crisis. This can also be taken as an indicator that much of the industrial restructuring, including substantial labor shedding, still lies ahead. The interplay between new firm creation and the downsizing of less productive old firms is taking place, but substantial output and productivity gains from new enterprise creation can only occur when net job creation in industrial production improves, although employment growth in small industrial enterprises has also improved. The data indicate that yet more downsizing should be expected in this sector in addition to new enterprise creation.

The policy consequences focus on the need to strengthen investment, and in particular the creation and growth of new firms which can absorb some of the labor shedding from old companies; on the role of the public sector in strengthening social protection to support the necessary downsizing; and also on mechanisms, such as further privatization where unitary firms are still present, that will increase the flexibility of those parts of the enterprise sector that are in need of restructuring.

Separately, recalculating the national accounts raises the particular issue of tax loopholes for the oil and gas sectors. Independent from the fact that the high profitability of the firms in question provides a strong economic rationale for enforcing full tax payments, it is important to establish a level playing field, and for the public sector to enforce it without recourse to subsidization.

4) Job creation has been strongest in the small and medium enterprise sector. Experience elsewhere suggests that Russia is in the early stages of dissolving existing structures and introducing new activities, but that the economy has not yet found its equilibrium or defined the core sectors that will allow it to grow in a sustainable way. Russia’s industry has large and
excessively concentrated physical production facilities ("establishments"), but small firms. Pressures for consolidation have led to a substantial increase in horizontal integration.

The previous investigation into the interplay between job creation and destruction calls for a closer look at the mechanisms that shape restructuring at the enterprise level (section C4). Russia starts from a peculiar situation, because its economy is still dominated by physical production facilities ("establishments") that are oversized in comparison to other economies, so that plant size appears overly concentrated in relation to the size of the market. On the other hand, most of the inherited establishments were privatized as single firms, leading to a firm-size distribution that is dominated by more small firms than elsewhere. Multi-plant firms are rare, average firm size is small, and markets are not very concentrated if firm sales are taken as the yardstick. Production establishments that are too large and firms that are too small indicate that restructuring within industry has two dimensions: whereas production facilities may still be in need of downsizing, firms are in need of consolidation to enhance efficiency at the plant level.

The policy implications at this stage mainly concern the institutional reforms necessary to enhance firm-size consolidation, including strengthening the legal environment for mergers and acquisitions, creating more efficient secondary markets, and increasing the transferability of property rights. However, the findings of this section also raise the question as to who will be most likely to drive forward the necessary consolidation on the firm level in Russia.

5) A unique new database on the ownership and control of the largest Russian enterprises was collected for this report, to trace some of these questions in depth. According to this database, ownership within firms is highly concentrated in all segments of the private sector. Ownership concentration within industry and across the economy in general is dominated by the largest private owners and the business groups they form. However, ownership concentration is uneven across sectors, and ownership is most concentrated in key strategic sectors. The evidence in our sample, of how financial-industrial groups with significant ownership rights nationwide perform compared to smaller private owners, is mixed. On the one hand, the data do not imply that large owners perform better than smaller ones if yearly performance measures are compared (in fact, large owners performed less well in 2001). On the other hand, productivity in enterprises controlled by nationally significant owners appears to have grown more rapidly, if the two available data points (2001 and 2002) are connected. Only future data collection to establish a longer time series can reduce the number of seemingly reasonable explanations. Generally, private companies (including foreign owned) outperform publicly owned companies (with federal or regional ownership), and foreign owned private companies outperform domestically owned private ones.

The report examines the role of concentrated ownership in strengthening enterprise performance and restructuring (section C5). The CEM introduces a detailed data set on ownership and control in Russia, covering about 1,700 large firms, listed and unlisted, in industry and services, and employing 4.3 million people. The industry part of the sample represents 22 percent of Russia's industrial employment and 66 percent of industrial output. Banks in the database cover 68 percent of assets in the banking sector. The data were used to address three principle questions: first, how concentrated is ownership in Russia’s economy? Second, what are the implications of this concentration for economic performance? And third, what do the data imply about “state capture” (i.e., the ability of businesses to obtain preferential treatment from government agencies)?

Ownership concentration in Russia is substantial in the sense that the ownership positions of a number of business groups are significant at the national level. The data thus support the conventional wisdom that company ownership in Russia is highly concentrated. However, the
degree of concentration is distributed very unevenly across sectors. The 22 largest private owners and their financial-industrial groups (FIGs) tend to control enterprises in a number of “strategic” sub-sectors: oil and raw materials, automobiles, and chemicals. In other parts of the economy, ownership and control is not particularly concentrated, and there is a preponderance of smaller, domestic private owners, with high ownership concentration only at the level of individual firms.

With respect to the relationship between enterprise performance and ownership concentration, the most important findings are as follows. First, comparing the level of labor productivity in each year reveals no evidence that firms controlled by the largest owners systematically outperformed the rest of the economy in either 2001 or 2002. Second, nothing in the data supports the conclusion that state-owned firms, whether owned by federal or regional government, perform better than the group of private owners. Third, total factor productivity grew most rapidly between 2001 and 2002 in firms controlled by foreigners and in firms controlled by the group of largest private owners, both of which on this count outperformed other private owners. Fourth, however, in spite of the rapid productivity growth, there was still a statistically significant difference in productivity levels between the different private Russian owners in 2002. The performance of the largest owners still was worse. The main pending question then becomes whether large owners have continued to outperform other owners in terms of productivity growth after 2002, which would eventually bring their productivity to levels above those of other private owners. This will require further study based on data from subsequent years, which are not yet available.

Overall, the data now available, while confirming and detailing a high degree of ownership concentration in Russia’s economy, are still inconclusive on key questions. The most important of these is whether the potential benefit of a high concentration of ownership (improving efficiency through fostering enterprise consolidation and restructuring) can outweigh its potential pitfalls (if the high concentration of private ownership concentration is explained by non-economic benefits to the scale associated with different types of lobbying power and preferential treatment) and would therefore be detrimental to long-term economic growth in Russia.

Section C5 also matches external data on preferential treatment in regional legislation with the CEM data on the control of Russian enterprises. Specifically, we ask whether it matters who owns those firms that successfully “capture” regional governments (i.e., receive preferential treatment). The answer is that firms controlled by regional private owners (who are not active nationally) and firms controlled by foreign investors are more likely to receive preferential treatment from regional governments than firms controlled by the largest owners (who operate nationally), and firms with dispersed private ownership. However, the benefits from receiving preferential treatment and the negative impact on growth and economic performance of other firms in the region – and therefore usually on aggregate economic performance – is greater if nationwide financial-industrial groups “move into” a region than if regional enterprises receive the preferential treatment. In other words, large business groups profit most from state capture at the regional level and the impact is most negative on other enterprises.

There are basically two mechanisms for avoiding state capture and cartels that undermine competition while at the same time maintaining the efficiency gains from ownership consolidation at the firm level. One is to encourage continued global integration, including WTO entry, competition from abroad in Russia’s product markets and foreign investment, most of all into those sectors dominated by a few large groups. Efficiency, growth and consumers themselves all gain through competitive entrants from outside. The other mechanism is to encourage effective antitrust and antimonopoly legislation and the development of institutions
capable of enforcing such policies. This is not merely a problem of implementation, since the existing legislation is largely outdated. It remains, of course, crucial that a rule-based antitrust system is binding for all parties, including the state.

**Looking forward**

All told, Part C contains a detailed account of structural change in Russia, which does not lend itself easily to simple policy prescriptions. However, **Part D** summarizes three main observations that follow from the analysis and that appear important in establishing policy priorities to accelerate economic growth, reduce poverty and limit dependency on natural-resource exports. Two of these observations relate to questions which were raised in the introduction, and the third follows from their answer. The initial two questions were: what is the link between structural change and rapid economic growth, and what is the link between structural change and diversification of the economy? The third question is: how should tasks be divided between the public and private sectors in order to harness the benefits of structural change?

The challenge for policy makers is to avoid subsidizing the moribund legacy of central planning at the expense of more vibrant parts of the economy. The potential rewards in the form of productivity gains are large. Accelerating structural change therefore can make a substantial contribution to economic growth in the long run, despite possible short run adverse effects. Russia has the resources to speed up the necessary adjustments, and the data provided in this report indicate that much of the task can be accomplished constructively—i.e., not just by job reduction. In addition to the necessary removal of subsidies, there are opportunities to change the incentive system through public investment. For example, people's ability to relocate (both geographically and from job to job) will increase through investments in transport infrastructure and, even more important, in education. However, major distortions, such as the pricing of domestic energy, need to be tackled decisively to avoid adverse impacts on long-term growth (for example, from installation of energy intensive equipment, which will be unable to compete as soon as energy price subsidization ends).

Regarding diversification of the economy, the report acknowledges the obvious need to reduce current overdependence on natural-resource exports (a situation where 1 percent of the workforce creates almost one-fifth of GDP). Lessening dependence on oil and gas will enable Russia to escape vulnerability to international price changes, and, in particular, to improve upon the present situation, where annual growth above 5 percent has occurred only with increasing hydrocarbon prices.

Economic or industrial policies designed to redistribute resources (for example, by giving tax breaks to selected industries), should be avoided. Based on the data in this report, diversification is already taking place, and it is taking place most rapidly in those sectors and regions where hard budget constraints enforce structural adjustments and where government intervention is minimal. Where government intervention is significant, as is the case with non-market services, structural change has slowed down.

The report provides further examples of the perils of state intervention in Russia. Market sectors consistently outperform non-market sectors. Within industries, privately owned companies (of any ownership category) consistently outperform public companies. Moreover, the foggy borderlines between private and public interests in many instances convey serious doubts that even modest industrial policies could be implemented without increased corruption and erosion of the competitive environment. The tasks of restructuring that lie ahead are so complex that it is
unreasonable to suppose that any government agency could solve the puzzles involved better than decentralized private sector decision makers with a stake in the outcome. Policies which foster structural change are the best way of supporting increased diversification in production. Direct public interventions aimed at fostering diversification will lead to additional inefficiencies and will thus slow down economic growth.

The third observation relates to the role of the state in fostering structural change by establishing the rules and the framework within which economic activity takes place. The private sector has often moved far ahead of reforms initiated by the public sector. This “performance gap” has an adverse impact on the speed and efficiency of structural change. Examples are many – such as slow reforms in the government monopoly sectors and the threat that today’s price distortions may damage the future structure of production; slow reforms in education and transport infrastructure and the tax this imposes on people’s capacity to move to new employment and locations; the lack of financial sector development, without which liquidity inflows can create short-term volatility without helping to satisfy the investment needs of Russia’s real sector; and incoherent administrative intervention and law enforcement that slows new firm growth.

The final observation draws conclusions from the study of ownership concentration. Competition is the most powerful driver of economic growth. It needs to be protected, not only by removing arbitrary interference in small and new businesses, but also by imposing rules on the non-competitive behavior of big business, which may operate through collusion of powerful private groups in the marketplace, or by collusion between private and public agents. In order to maximize the beneficial effects for the economy deriving from big business activities, Russia needs legislation and institutions which safeguard competition without putting big business and other firms into a straight jacket. Above all, it needs an active and clear-cut competition policy – a policy, however, that is evidently rules based and therefore binding for all parties, public or private, and that avoids the pitfalls of apparent arbitrariness and discretion on the part of the implementing authorities.

The way forward is evident. It is based on the protection of private property, strict antitrust policies, free competition, and global integration. Advances in this direction may need to overcome powerful interest groups, but the ultimate reward will be a business environment that can unlock the potential for rapid growth in all parts of Russian society.
A. INTRODUCTION

1. Russia in 2004 has reason to celebrate its economic recovery, the magnitude of which would have surprised even the most optimistic observers at the time of the 1998 crisis. Yet despite this success, there is still much to be accomplished for Russia to catch up with developed economies.

2. In order to achieve this objective two key points stand out. The first is the need for an economic development strategy focused on maximizing economic growth. President Putin emphasized this in his annual state of the nation address (in May 2003), and has recommended it as the most effective tool in fighting poverty. The second task, expressed by the government and particularly by the Ministry of Economic Development and Trade (MEDT) in its “Strategy for Future Social and Economic Development of the Russian Federation” (October 2003), is the need to diversify Russia’s economy away from natural-resource production.

3. Both of these points require a good understanding of the relationship between structural change and economic growth. The role of various sources of growth needs to inform the target of maximizing growth. Diversification is important to support sustainable growth, to guard against the threat of sudden fluctuations originating from fluctuations in international hydrocarbon prices, and to prevent internal segmentation in a society where 1 percent of the workforce produces 20 percent of GDP.

4. Relatively little research is available on the speed and overall extent of structural change in Russia and on its contribution to growth (beyond sector reports), and there is a particular shortage of research for the post-crisis period. This Country Economic Memorandum (CEM) therefore seeks to explore the nature of structural change in Russia and its linkage to economic growth by focusing on the degree to which various dimensions of economic distortion play a role in the country’s structural transformation.

5. The starting point of the report is the hypothesis that Russia’s economy is still an economy in transition, meaning that its resources are not allocated efficiently. Its economy is still “disorganized,” suffering in many ways from the peculiar legacy of central planning. In economists’ parlance, Russia operates inside its production possibility frontier, so that huge efficiency gains can be gained from advancing towards this frontier via the reorganization of the existing means of production, or by simple resource re-allocation. The production possibility frontier itself may shift over time, determined by traditional long-term forces of population growth (negative in Russia) or technological change. But these processes are slow and should not detract from the huge potential for structural change to move the country up to the frontier.

6. Structural change thus becomes a powerful determinant for medium-term growth and long-term growth prospects. However, it is clear that Russia’s rapid rebound since the crisis has had many other determinants. The role of oil exports has received most attention in the economic literature on Russia. In addition, there have been changes in relative prices, such as the exchange rate, interest rates, and real wages, which were triggered as an endogenous reaction to the crisis and which helped to spark growth. There were policy changes, and (crucially) huge underutilized capacity that helped translate these initial sparks into a sustained

---

1 Cf. Schleifer and Treisman (2004), Gaddy and Ickes (2002), for the “normal country” discussion and a detailed listing of a particular long-standing aspect of Russia’s socialist legacy, respectively. McKinsey (1999) provided an earlier, detailed account of the potential for productivity growth in Russia’s industry, Craver and Leijonhufvud (2001) detail the run-up to the crisis early in transition, and Hill and Gaddy (2003) provide a comprehensive discussion of the spatial distortions Russia inherited from its past.

2 As we will see in section C2, even if its economy currently operated at the efficiency frontier Russia would still have to move a long way along this frontier for its production structure to adjust to market demand.
period of high growth and economic recovery. Part B addresses these effects, explaining why Russia did not experience the dent in trend output growth that is "normally" associated with the aftermath of a severe financial crisis. Part B also tries to determine which of these effects were of a transitory nature and which of them can be counted on to contribute to sustained growth over the long term.

7. The remainder of the report (Part C) concentrates on how the structure of Russia's economy has changed and how this affects the potential for reaching the targets outlined above: rapid economic growth and diversification. Where appropriate, the report also discusses policies deemed suitable to unlock this potential. Discussion of "structural change" requires precision, as many people understand different things by the term. Part C therefore focuses on five key dimensions of structural change.

8. The analysis begins (C1) by drawing attention to the massive geographical and demographic changes that the country is undergoing in its quest to correct the legacy of central planning. Although the observable population movements are huge, there are good theoretical reasons to argue that the emerging patterns are – contrary to what is often claimed – essentially impossible to predict, and certainly impossible to plan. The only unarguable point is that people will "move where the jobs are." Consequently, the second section (C2) investigates in detail how the sectoral composition of employment (between agriculture, industry and different types of services) has changed in Russia, and where new jobs have emerged. Benchmarking these changes leads to predictions of their further course. It becomes obvious from this section that Russia has already undergone large transformations that make it decidedly more similar to its international peer group.

9. This raises the question of the implication of this reallocation of jobs for economic growth. Are the necessary productivity improvements driven by employees shifting from one sector to another (for example, from industry to services), or are productivity improvements due more to restructuring within sectors (for example, restructuring industrial production)? These questions are addressed in the subsequent section (C3).

10. Any attempt to answer this question requires a precise understanding of the composition of GDP (i.e., of the contribution that different economic sectors make to value added, the number of people working in these sectors, and the development of sector productivity over time). This raises the issue of transfer pricing (where profits, especially in the energy sector, are transferred from the production subsidiaries of companies to their trading subsidiaries, which in turn have the capacity to minimize tax payments by various legal and illegal means). In Russia, transfer pricing leads to a considerable overestimation of the contribution of the trade sector (and hence services) and an underestimation of the contribution of oil and gas (and, hence, industrial production) to GDP. Goskomstat makes enough data available to allow for a recalculation of the sectoral composition of GDP, which is also undertaken in C3.3.

11. A more accurate assessment of GDP composition allows one to address the question of whether movements of people across sectors or restructuring within sectors contributes more to economic growth in Russia. The analysis suggests that restructuring within sectors, particularly industry, is still the biggest driver of growth in Russia. This is a partly a function of the importance of the hydrocarbon sectors, but, more important, it is also a broader reflection of the potential offered by industrial restructuring.

12. This, then, calls for a closer look at what exactly is meant by restructuring, what drives the process and how it can be accelerated (C4). What emerges is that restructuring in Russia has two distinct dimensions. First, there are the structural problems that have been encountered and

---

3 Goskomstat and the World Bank are currently investigating whether and how the national accounts can be adjusted. The need to recalculate GDP and the method used are also discussed in World Bank (2004b).
solved in other former socialist economies. Russia’s industrial sector is still comprised of oversized plants and production facilities that are in need of downsizing to realize productivity improvements. The number of people working in “new” enterprises (i.e. enterprises created and growing up already under competitive conditions) is still limited. Although progress has been made, Russia, compared with other countries, still employs too many workers in large plants with low productivity. Downsizing these old units and creating new enterprises that can eventually supplant the old is the first and more conventional dimension of restructuring. Production units under central planning were large, and production in that sense was excessively concentrated for today’s needs.

13. The second dimension relates to the size of firms – meaning legal entities and not physical production facilities. Firms in Russia are not concentrated at all, but are fragmented. Relatively few people in Russia work in large firms, and there is a lack of multi-plant firms (on the model of GE or Siemens). This is a legacy of the particular form of privatization applied in the 1990s., Single plants and other production facilities were mostly sold to their managers and each of them became a single firm. Consequently, the number of firms in Russia is relatively large and their size is small, whereas the number of production facilities (or factories) is still large, and they tend to be oversized.

14. This is important because it indicates enormous economic benefits from consolidation at the firm level. Mergers, acquisitions, and other forms of takeovers will be widespread so long as this economic pressure persists. And the experience and industrial structure of other countries suggests that consolidation at the firm level will drive the restructuring of plants and factories. The data in Russia already offer encouragement: the majority of new Russian jobs in 2002 were created in enterprises with 30 to 60 employees, and no longer in micro enterprises.

15. Part C concludes with an analysis of consolidation and the agents of change behind the consolidation process. In Russia there are few individuals or business groups with the financial resources to act as agents of change on such a large scale. However, extremely limited data have been available to date on just how many agents own accumulated wealth, which makes them significant as owners on a national scale, and how this affects the economic efficiency of their business groups and holdings. This has motivated a very detailed inquiry into the distribution of ownership rights in Russia’s economy (C5).

16. A detailed database on ownership and control in the Russian Federation was created for this study in order to address three questions: how concentrated is ownership in Russia’s economy? What are the implications of this concentration for economic performance? And what do the data tell us about preferential treatment for powerful business interests, which may adversely affect growth?

17. The data confirm that ownership rights in Russia are highly concentrated, although this concentration is subject to wide variation across sectors. The data also show the ambivalent role of large owners in economic development. Such owners can use their investment resources for new capital formation and for the acceleration of growth. However, they may also often become large not because of economic merit but because they operate in an environment characterized by weak market institutions and inadequate enforcement of rules. This environment rewards size because it allows more effective lobbying and influence peddling. Thus the large owners can just as well become a brake on growth by subverting resources and by colluding with state structures or with each other.

18. Finally, the report turns to the question of how to harness contributions to growth from all levels of the economy, and how to limit the potential damage that powerful owners can inflict? The best answer, in our view, is the creation of realistic antitrust and antimonopoly policies, along with agencies capable of enforcing them. Much has been achieved in Russia to deregulate
and protect new, small and medium-size businesses in recent years, but rules ensuring competition at all levels of the economy are equally necessary and have not yet been developed to the same level of quality. Existing competition legislation is largely outdated, and implementation is also a problem. It is obviously important that rules should be binding for all, including the state, and that arbitrariness in their implementation needs to be avoided.

19. Russia is, its transforming economy is a tapestry of epic proportions, and much weaving remains to be done. Nevertheless, many aspects of Russia’s transformation have been seen before, if on a smaller scale, in the countries in Europe on which the Soviet economic system was imposed. The findings of this report imply that, at the most fundamental level, transition in Russia as elsewhere is best described as a race between categories of enterprises: new ones built and developing under competitive conditions, and old ones inherited from the era of central planning and geared to the needs and priorities of that defunct system. Creation of the new and destruction of the old are both moving ahead rapidly: the risk of creating new distortions during this difficult and complicated transition period is best minimized if this evolutionary process of creative destruction is guided by competition. This will require strong institutions which can enforce a clear set of rules, eliminating all arbitrariness and binding on all players in the marketplace, be they large or small, public or private, and on the state.
B. GROWTH AFTER THE CRISIS: MACROECONOMIC FACTORS

20. Russia found itself in an excellent macroeconomic position at the end of 2003. The economy grew by a cumulative 38 percent in the five years from the 1998 financial meltdown to the end of 2003, and growth shows no signs of abating. Inflation has gradually declined, reaching 12 percent in 2003. The macro-accounts are all in the black, with the federal budget running a surplus in 2003 for the fourth year in a row and with another surplus equal to 0.5 percent of GDP forecast for fiscal 2004. The current account surplus was 8.1 percent in 2003, and reserves hit record highs of US$86 billion by February 2004.

21. But however much Russia has improved, many observers have doubted whether the growth is sustainable. It is not clear how much is owed to reforms, prudent macroeconomic management, and structural changes in the economy, and how much is simply a rebound from the 1998 crisis, aided by underutilized capacity and relative price changes imposed by the crisis (such as exchange rate depreciation and real wage decline). Just as important, it is not clear how much of the success comes from the persistent good fortune of increases in international prices for hydrocarbons, which are Russia’s key commodity exports. A related question is that of sustainability and future growth performance: have the years of high growth been used to develop an economy that is now more diversified and thus less dependent on extractive industries, and has the risk of volatility therefore decreased and has growth become more sustainable, or is growth a chimera, likely to evaporate every time hydrocarbon prices decline? How much hay was made while the sun shone?

22. Addressing these concerns, this part of the CEM briefly reviews reasons for the rapid post-crisis recovery of Russia’s economy that are unrelated to structural change. The current situation and future prospects regarding structural change in Russia, which are the main theme of the CEM, are discussed at greater length in Part C.

(a) Growth after the crisis

23. The impact of the 1998 financial crisis on the real side of the economy, in particular on employment and real GDP, was minor, and Russia proved an exception to the rule that financial crashes and defaults leave a measurable dent in output growth during subsequent years. Russia rebounded quickly. By 1999, GDP was growing at 6.4 percent, and by 2000 growth was 10 percent. While slowing down slightly over the next two years, GDP growth rates remained higher after the crisis than at any time since the start of reforms.

---

5 Calculated as current account surplus of US$35.9 billion for 2003, with a GDP of US$433.1 billion.
6 The limited impact of financial turbulences on real variables is a phenomenon that Russia shares with other transition economies. Financial crises in Albania (1997), Latvia (1994), Bulgaria (1996) and Romania (1999) also failed to have an impact on GDP (Bordo and others 2001, Eichengreen and Rühl 2000).
24. Figure B.1(a) shows the decline and subsequent rise of GDP in constant prices. The overall picture is of an economy with rapidly expanding value added in all major sectors, particularly in the two main components of GDP that are market-driven, namely industry and market services.\(^7\)

25. Figure B.1(b) describes another real variable—employment. Employment had fallen by more than 15 percent from the dissolution of the Soviet Union until the 1998 crisis. It started to grow immediately after the crisis, for the first time since the Soviet breakup. However, the time series for employment differs from that for output. First, employment did not bounce back as decisively: cumulative employment growth from the low point in 1998 until the end of 2002 was less than 4 percent, while the corresponding number for aggregate output was 29 percent. Second, not all of the economy’s main sectors participated equally in this expansion: employment in the service sector grew throughout the post-crisis period, but employment in industrial production did not.

\(^7\) Changes in the composition of output are discussed in detail in Part C3 of this report.
26. These few numbers suffice to illustrate one of the most important features of Russia’s recovery, namely, that Russia experienced labor productivity growth on a large scale after the crisis. However, it would be rash to claim that the recovery was due to genuine productivity advancements, resulting from re-allocating given factors of production, or to intensive growth. Investigation of what drove the observed improvement in the ratio of the value of output to the value of labor leads quickly to the role played by underutilized capacity: growth in the early years after the crisis was greatly facilitated by the existence of a huge spare capacity in capital and labor, and it can be reasonably argued that extensive growth (in the sense of increasing utilization rates rather than output capacity) dominated aggregate growth after the crisis and that efficiency gains through factor reallocation became prevalent only after the summer of 2002.

27. Years of output decline before the crisis contributed to the role played in the recovery by the increased utilization of physical capital (plant and equipment) and human capital (labor), which had often been formally employed but, in fact, neither paid nor working in the pre-crisis period. Data on capacity utilization is sparse in Russia, but the growth rates, which are available, suggest that utilization rates increased massively until about mid-2002 (see Table B.1). By and large, the initial post-crisis years were years of high growth and a relatively low share of investment (investment accelerated substantially in 2003). Although there is no reason to suppose that utilization rates move in lockstep across sectors, it seems reasonable to conclude from Table B.1 that the advantage of “extensive” growth, based on simply increasing the utilization of existing capacity, has evaporated for the economy as a whole since mid-2002 (World Bank 2004b).

### Table B.1 Changes in Investment and Capacity Utilization after the Crisis, 1999-2002

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of increase of fixed capital investment, %</td>
<td>1</td>
<td>17.4</td>
<td>8.7</td>
<td>2.6</td>
</tr>
<tr>
<td>Rate of change of capacity utilization, % (CEA)</td>
<td>8.9</td>
<td>7.4</td>
<td>8.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Rate of change of capacity utilization, % (REB)</td>
<td>12.4</td>
<td>7.8</td>
<td>3.8</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source: Goskomstat, REB, CEA.

28. Underutilization of capacity in a previous period can greatly facilitate rapid growth, but it does not cause economic growth by itself. An impulse is needed, and there were additional, post-crisis, factors capable of providing such an impulse. First, hydrocarbon export prices started to rise substantially after the 1998 collapse. Contributing to a current account surplus of about 10 percent, they look like the most important driver of growth in Russia to the present day. Second, the crisis itself created conditions that triggered high growth – by imposing changes in relative prices on the one hand, and by changing the behavior of economic agents, including the government (entailing changes of economic policy), on the other hand. Finally, efficiency improvements and genuine restructuring of production processes (i.e., changes in the input-output mix throughout the economy) also accelerated growth.

29. In reality, and given the special role of low capacity utilization, a combination of all four of these factors determined Russia’s impressive growth performance. The extent and timing of restructuring will be discussed in Part C of this report. The remainder of this section thus discusses the role of hydrocarbon prices, of relative price changes, and of changes in behavior and economic policy triggered by the crisis.
(b) The role of oil price changes

30. Russia’s economy remains fundamentally dependent on oil and gas. According to official statistics, approximately 80 percent of Russian exports in 2003 were natural resources, and 55 percent of all exports were from the oil and gas sector. More than 60 percent of Russia’s fixed capital investments either go into the hydrocarbon industries or are in one way or another related to the public purse. The budget itself is dependent on oil and gas: 37 percent of federal budget revenues originate from hydrocarbons. Every increase in the price of Ural crude by US$1 per barrel is estimated to raise federal budget revenues by 0.35 percent of GDP, and to raise consolidated budget revenues by 0.45 percent of GDP (Kwon 2003).

31. However, the official figures underestimate the share of oil and gas in Russia’s economy. For example, official data for 2000 put the share of GDP originating in the oil and gas sector at a paltry 8 percent. At the same time and according to the same source, oil and gas exports alone were worth about 20 percent of GDP. While feasible in theory (if domestic prices are sufficiently low compared to export prices), this is not very plausible. However, the figures fall into place when the national accounts are adjusted for transfer pricing: this requires a short digression, but the results are important for estimating the share of oil and gas in GDP.8

32. Many firms in Russia still use trading companies to minimize taxes through transfer pricing. This can be done legally, by exploiting tax loopholes (that have largely been closed since the beginning of 2004), for example, by setting up a trading subsidiary in a Russian region where it can obtain local tax relief, particularly with respect to the profit tax (such regions are often called “internal offshores”). The firm then uses transfer pricing to move profits from the industrial subsidiary to the trading arm: the output of the industrial firm is sold at an unrealistically low price to the trading subsidiary, which sells it on at the higher market price, and the markup accrues to the trading firm, which benefits from the lower effective tax rate. The same method could be used by firms facing sector-specific taxes that are calibrated to turnover by moving profits to their trading subsidiaries, if the latter are taxed at lower rates. However, illegal variants of this scheme, where the trading subsidiaries are shell companies that disappear after a number of transactions and therefore do not pay taxes at all, are also known in Russia. Whether legal or illegal, the effect on the national accounts is simple and direct: profits and value added, reported to the statistical agency, are moved from the sector that produces them to the trade sector. The distortions are significant enough to have an impact on the national accounts and show up very clearly in the huge margins earned by the trade sector.9

33. However, it is possible to estimate this effect fairly precisely, both in aggregate and by sector, using Goskomstat’s input-output tables for the Russian economy and calibrating the trade margin to what is observed in the national accounts of market economies (Goskomstat 2003a). Although the adjustments required to keep the input-output relationships intact are complex, the impact on GDP is straightforward. The adjustment using margins from Canada is less than if margins from other market economies are used, but the effect is still to move a massive 13 percentage points of Russian GDP from trade, which drops from 27 to 15 percent of GDP, to industry, which increases from 28 to 41 percent (the figures are for 2000, the last year for which input-output tables are available). Most of the adjustment accrues to oil and gas,

---

8 The adjustment of the national accounts is discussed in detail, including numerical estimates and a conversion table, in section C3 below. In order to better estimate the influence of transfer pricing and differences in domestic and export prices of oil and gas on GDP structure, further computational work will be carried out together by the World Bank and Goskomstat. Agreement about collaboration was reached in April 2004.

9 The official statistics contain peculiarities that hint at the size of the problem. For example, according to the national accounts, almost half of all profits in Russia’s economy are generated by the trade sector. Or, in the trade sector, profits are about 10 times the wage bill, while, in the rest of the economy, wages and profits are about equal in size on average.
which more than doubled in size from 8 to about 20 percent of GDP in 2000. It is worth noting that the increase in the contribution of oil and gas to GDP becomes larger if the United Kingdom, Norway, or the Netherlands (all energy producers) is used as a benchmark.

34. This recalculation allows us to reassess the true share of natural resource production in Russia’s value added. The implications go beyond the obvious point that GDP generated in oil and gas (and therefore in industry in general, as natural resources are sub-sectors of industrial production) is larger than suggested by the official national accounts. First, the larger share indicates that Russia’s economy is more exposed to world movements in energy prices than the official GDP figures imply. Second, the huge scale of profits moved to tax-efficient locations has fiscal and budgetary implications. Third, the practice is more widespread than usually reported: it is used by private and state-owned companies, and not only in oil and gas, implying a group of businesses with a strong interest in maintaining the current favorable tax regime.

35. No matter how it is estimated, the share of oil and gas in GDP only measures the direct contribution to growth of changes in the international price for these commodities. The indirect effect is larger and harder to estimate. Since only 1 percent of total employment is in the oil and gas sector, any macroeconomic impact will to a large extent run through variations in investment and consumption demand triggered by expenditures in the hydrocarbon sector.

36. And indeed, disaggregating Russia’s GDP growth by demand components shows that the biggest contribution to aggregate growth came from export demand in 1999, from investment demand in 2000, and from consumption demand since then. This is sometimes used to argue that the cycle has closed (i.e., that post-crisis growth was initially driven by higher export prices for oil and gas, which subsequently translated into higher investment demand, and then into higher consumption demand, so that self-sustained consumption is now the main driver of growth). However, this would be too simplistic. By itself, the disaggregation merely shows that consumption has become the biggest demand component (it could hardly be otherwise), but does not shed any light on the multiplier that made it so, that is, on the role of hydrocarbon revenues in maintaining (past or) current consumption and investment levels. So this disaggregation does not allow for conclusions about causality.

37. What, then, can be said about the role of hydrocarbon exports in Russian growth? One way of measuring the components of growth more precisely is represented in Figure B.2. It displays the growth rates of sectors representing extractive and export-oriented industries on the one hand, and manufacturing industries, producing mostly for domestic demand, on the other. By this measure, the natural resource sectors started to outperform domestic manufacturing in 2002 for the first time since the beginning of reform. Although growth rates in the manufacturing sectors have since started to catch up, natural resources are still growing more rapidly to date. Natural resource and export-oriented industries are thus enlarging their share in total industrial output, so that exposure to the risk of external price shocks is currently increasing and not decreasing.

---

10 The remainder is distributed across various industrial sub-sectors. The precise shares for Russia (from the official 2000 input-output table at basic (factor) prices) are 7.8 percent for oil and gas and 13.3 for natural resources (with the latter defined as including oil, gas, ferrous and non-ferrous metals, and coal). The recalculated figures using Canadian trade margins come to 19.2 and 26.4 percent, respectively. The increase in shares is larger if margins from the other market economies cited above are used. See section C3 of this report.

11 IMF (2003) contains the decomposition. Recalculating for the latest available date (using Goskomstat figures) shows that the share of consumption demand in GDP in 2003 is, at 67.4 percent, considerably larger than that of investment demand (20.6 percent), but the rate of growth of investment outperformed that of consumption in 2003.

12 The sectors are, in Goskomstat classification, ferrous and non-ferrous metals, fuel and energy, and wood processing (representing the export-oriented natural resource sectors); and electricity, chemical, machine building, construction materials, light industry and food (representing domestic manufacturing).
38. Another way to account for the impact of hydrocarbon prices on growth is to measure directly the elasticity of GDP growth on the oil price over a sufficient length of time, and then to use this elasticity to gauge more limited intervals. Although fraught with difficulties, particularly in view of Russia’s turbulent economic history, this thought experiment carries more credibility. Much depends, however, on how the investigated period is chosen. The first half of 2003 seems to be a suitable candidate. It was, on the one hand, a period of accelerating GDP growth. Growth, having slowed previously (4.7 percent in 2002), bounced back with a high rate (7.2 percent) and, with investment rising rapidly (12 percent year-on-year) and recorded net capital inflows positive for the first time since 1999, growth was widely seen as anchoring itself increasingly outside the hydrocarbon sectors. But skepticism remained, since it was also a period when prices for Russian oil had again risen substantially (by 28 percent alone in the run-up to the Iraq war).

39. Table B.2 contains a simple decomposition of GDP growth rates into two components, which aims to isolate the relative impact of oil and non-oil factors on aggregate growth in the first half of 2003. The oil price effect captures the direct and indirect contribution of oil price changes on the growth rate. The residual captures the contribution of non-oil price factors.

40. The oil price effect is calculated using the elasticity of the GDP growth rate with respect to changes in the average price of Russian oil. Table B.2 contains three elasticities to capture the effect of oil price changes on GDP growth. The middle estimate of 0.07 (implying that an increase of 1 percent in the average price of oil adds 0.07 percent to GDP growth) is derived from calculations in a forthcoming World Bank study that models the relationship between the real exchange rate and GDP since 1994, and it is taken to be the most plausible estimate (World Bank 2004). The two additional scenarios, depicting elasticities of 0.05 and 0.1, respectively, are included here to generate a broader range of estimates (World Bank 2003b).

41. For the calculations, we assume a three-month lag between the sales contract and the actual impact of oil receipts on expenditure. The oil price effect on GDP growth in the first half of 2003 was therefore calculated using the percentage change from the average Ural price during the period October 2002 through March 2003 (US$17 per barrel) to the average price during the period October 2001 through March 2002 (US$24.3 per barrel). That percentage change was 43.2 percent.
42. With a percentage change of 43.2 percent and an elasticity of 0.07 percent, the implied increase in the growth rate of GDP in the first half of 2003 is 3 percent. Using the plausible range of estimates in Table B.2, the effect of increased oil prices on growth would be between 2.2 and 4.3 percent. The conclusion from these estimates is that GDP growth for the first half of 2003 (7.2 percent), excluding the impact of the quite dramatic oil price increase since late 2002, would have been somewhere in the range of 2.9 to 5 percent. In the Bank’s best estimate, it would have been around 4.2 percent.

Table B.2 Decomposition of GDP Growth Rate in 2003

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elasticity of GDP growth rates with respect to oil prices</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Oil price effect for H1 2003, %</td>
<td>2.2</td>
<td>3.0</td>
</tr>
<tr>
<td>GDP growth in H1 2003, %</td>
<td>7.2</td>
<td>7.2</td>
</tr>
<tr>
<td>GDP growth in H1, net of oil effect, %</td>
<td>5.0</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: Goskomstat, World Bank staff calculations.

43. In general, repeating the exercise over time shows what one would expect: the higher the change in the oil price is, the lower the contribution of non-oil activities to GDP growth is. This works both ways: just as the massive oil price increase in 2000 resulted in a large contribution of the oil price to reported GDP growth in 2000 (5.9 percent out of a total 10 percent), small declines in the average oil price over the next two years contributed negatively. The effect of a changing oil price diminished GDP growth in 2001 by 0.1 percent (growth was 5 instead of 5.1 percent), and in 2002 by minus 0.9 percent (GDP growth was 4.3 percent instead of the 5.2 percent it would have been had the oil price remained as high as in the previous year). One of the important consequences of this observable interaction is that, thus far, growth rates of 5 percent or higher have been realized in Russia only at times when the oil price has increased.

44. Our calculations do not include natural resource exports other than oil and gas (the price of non-hydrocarbon commodities tends to move cyclically with the price of hydrocarbons). They are therefore unlikely to overstate the indirect contribution of natural resource exports to Russia’s growth.

45. And so the dilemma remains. Periods of high growth in Russia have been periods during which the price for hydrocarbons has increased. And while precise numerical estimates have to be taken with the proverbial grain of salt, it is reasonably accurate to say that Russia had an underlying trend output growth rate (defined as the rate of output growth, which would have resulted had the oil price remained constant) of 4 to 5 percent over the post crisis period 1999-2003. Russia only managed to exceed that rate substantially in the wake of substantial oil price increases.

46. The next question would be how much of this underlying trend growth rate was due to one-off opportunities generated by the impact of the 1998 crisis (such as the relative price changes that followed), how much was due to good economic policies, and how much to structural adjustment. The crisis did indeed create opportunities to “catch up.” We will now attempt to identify the most important specific post-crisis causes for Russia’s rapid rebound and will make a qualitative assessment of whether they are transitory by nature or whether they can be counted on to fuel Russia’s growth in the future. The next section therefore discusses the changes in relative prices and in the behavior of economic agents that were triggered by the crisis.
47. When Russia defaulted on its domestic debt in August 1998, few economists predicted a quick recovery. However, the impact of the financial crisis on real GDP was modest compared to what the country had been through before, and it was short-lived. In retrospect, the crisis was a watershed, after which things started to improve substantially. New sources of growth emerged as a reaction to the crisis itself, which raises the question of to what extent they are transitory.

48. In most interpretations, the crisis was overcome relatively smoothly because fortune finally smiled on Russia in a number of happy coincidences. In particular: (i) higher oil prices from early 1999 onwards helped to improve the balance of payments, as discussed; (ii) the breakdown of the fixed exchange rate led to immediate import substitution; and (iii) the impossibility of issuing more GKOEs and the domestic payment crisis imposed hard budget constraints on private and public agents alike and meant that post-crisis governments had to balance their budgets. We agree that each of these factors was of major importance. However, there are a few additional explanations for the recovery that help to shed light on the anatomy of Russia’s economy and on its prospects for maintaining high growth based on the post-crisis parameter changes.

49. Perhaps the first question should not be why growth took off in 1999, but why the real economy did not falter after the default of 1998. Of course, there is a cheeky response – given the very low ratio of private sector credit to GDP, why should there have been a credit crunch? Still, contraction should have been (and was) expected because the later recovery was preceded by the need to impose a very austere fiscal policy, with no more recourse to inflationary finance and, nolens volens, without new borrowing.

50. Interpretations starting from this point commonly emphasize that the impossibility of borrowing and the unwillingness to inflate imposed, for the first time, hard budget constraints on the economy, and in particular, that it cut off subsidies at the enterprise level. Negative-value-adding enterprises were finally allowed to fail (so the story goes) and resources were released to enterprises and activities capable of expanding. Hence, good enterprises grew and bad enterprises shrank or closed, which would explain the aggregate picture.

51. But the evidence is not convincing. The claim of extensive enterprise closures is unsubstantiated. There were no large-scale layoffs. Instead, aggregate employment rose after the crisis, even in industry, and labor productivity increased because output grew even more rapidly than employment. In fact, it appears that it was not employment which bore the brunt of the necessary adjustment costs, but wages.

52. Figures B.3(a) and (b) show the immediate impact of the crisis on Russia’s labor market. Employment, wages and labor productivity have been recalculated on an hourly basis in order to account for inaccuracies caused by flexible work times and labor hoarding during the period in question. Real wage cuts went deep enough to soften any quantity effects on output or employment. The massive productivity gains that set in after the crisis were preceded by an increase in work hours and an increase in employment. Figure B.3(b) details how output reacted, but also shows the distributional effects of this huge real wage (and real income)
adjustment. The real wage decline proved important in helping enterprises to survive and retain most of their workforce. But the alleged productivity boost resulting from enterprises adjusting output and employment downward is not visible in the data.

Figure B.3(a) Hourly Wages and Productivity, 1996-2002

![Image of Figure B.3(a) Hourly Wages and Productivity, 1996-2002]

Source: Goskomstat. World Bank staff calculations.

Figure B.3(b) Real Wages and GDP, 1996-2002

![Image of Figure B.3(b) Real Wages and GDP, 1996-2002]

Source: Goskomstat, World Bank staff calculations.
53. Other than demonstrating the amazing flexibility of Russia’s labor market, emphasis on the role of wages in post-crisis recovery has a number of implications for assessing Russia’s future growth perspectives. First, by cushioning firms from the sudden contraction that would otherwise have been unavoidable, the slashing of real wages may have delayed adjustment and restructuring measures. This is an element which will need to be probed more deeply later, when productivity at the enterprise level is discussed (see section C4). Second, explaining Russia’s post-crisis performance in terms of wage adjustment answers a question that has puzzled many economists in recent years – namely, how could real wages in Russia over the last few years possibly have grown more rapidly than either labor productivity or GDP? The answer is that they fell so far immediately after the crisis that there was a long way to go to catch up. Real wages did not catch up with either GDP or productivity until now (for the wage and profit share to remain constant, real wages need to grow in lockstep with labor productivity).  

54. It follows, however, that the times when the growth of wages and real income could easily exceed GDP and productivity growth, are over. This trend can continue in the future only if the share of GDP that goes to profits diminishes. Since such distributive changes are slow and difficult to effect, it looks as if any given rate of GDP increase will result in less tangible benefits for wage earners from now on than was the case in previous years – which, in turn, may negatively affect public acceptance of future reforms designed to increase GDP.

55. However, the real wage was not the only relative price that showed flexibility after the crisis. Figure B.4 shows the pattern of a few additional price indices that provided scope for recovery after the crisis. The role of real exchange rate liberalization in boosting import substitution has already been mentioned, and the dynamics of the real exchange rate offer a particularly intriguing tale of happy coincidences. In general, the trade-weighted real effective exchange rate (REER) in 2003 was still 11 percent lower than in July 1998. Although the rise from its lowest level (in January 1999) was a sizable 65 percent, the upward trend was held back by several factors. First, the economy was rapidly remonetizing as barter and other non-cash settlements shrank in 1999-2000. This greatly reduced the need to sterilize hard currency inflows related to the oil price increase in 1999-2000. More recently, the ratio of M2 to GDP improved dramatically, buttressed by quick acceleration of the ratio of private sector credit to GDP. However, as more people also chose to use the banking system rather than keeping their money “under the mattress,” the velocity of circulation slowed down, which in turn has helped to absorb excess liquidity in the system.  

56. Figure B.4 also displays another, often underestimated, factor – the fall in real domestic energy prices, which provided considerable cost savings for Russian enterprises at a time when export prices for hydrocarbons increased. The real price for electricity today remains below the level of mid-1998 and although the gas price increased considerably in 2002, crossing the 1998 threshold for the first time, it was quickly reined in by government resolution and fell to the level of the first half of 1998 in the election year of 2003. By consensus estimate, both prices remain below the long-term marginal costs of production. Like the price for electricity, the domestic gas price has not yet recovered to pre-crisis levels.

---

13 This phenomenon of real wage increases exceeding GDP growth caused a number of economists to issue ominous warnings about the sustainability of Russia’s growth rates (Schreft 2001).
14 This is particularly important with respect to the “threat” of high capital inflows that appeared in the first half of 2003.
15 On June 20, 2002 the government imposed limits on 2003 price increases at 20 percent for gas and 15 percent for electricity.
57. Electricity and the domestic gas price are essentially policy variables in Russia, and in this respect the lasting decline in domestic energy prices has to be viewed as a policy choice rather than a market reaction. This raises concerns that what was intended as a short-term boost to get the economy back on its feet after the crisis has, by now, turned into lasting support and will have adverse effects on long-term growth: if below-cost pricing of energy is being factored into investment decisions (as opposed to just supporting high utilization of the existing capacity), it will lead to the installation and maintenance of inefficient and energy-intensive industries that will be unable to compete internationally.

58. However, it would be churlish to deny that informed economic policies have also played a role in post-crisis recovery. The fact that the government could no longer place debt instruments did not only force it to balance its books. It also stopped the crowding out of investment in the private sector. Without the attractive alternative of government paper carrying extremely high real interest rates, private sector capital became available once more for private sector investment. The government surplus has been maintained ever since and shows no signs of abating. The imposition of hard budget constraints fed through to the enterprise level and transformed economic behavior in response to market signals. There is no reason to believe that this positive development will be reversed.

(e) Summary

59. Overall, and given the enormous importance of underutilized capacity in translating even smallish impulses into rapid output growth, the sources for high growth rates after 1998 can be divided into three subgroups, leaving out the structural factors to be discussed in Part C of this report. The three subgroups are the beneficial effects of hydrocarbon price increases, relative price changes, and changes in the behavior of economic agents (including economic policy
making). The most important components of these three subgroups can be summarized as follows:

(i) Underutilized capacity due to the long-lasting output decline during the 1990s was not matched by a parallel decline in employment. This allowed spectacular output growth rates without the accompanying investment growth as workers, who had been only nominally employed, began to do real work. There is evidence that this phenomenon was quite important in explaining Russia's growth rates after the crisis. However, by and large the economy reached full capacity utilization by mid-2002,\textsuperscript{16} and investment started to accelerate substantially in the following year.

(ii) Increasing hydrocarbon prices was perhaps the single most important, and most persistent trigger for scaling up economic activity after the crisis. Ural prices went from US$10.3 per barrel on average in 1998 to US$15.2 in 1999, to US$24 in 2000, and remained at US$20.9 and US$21 per barrel for the next two years. The average price for Ural crude in 2003 was US$27.2 per barrel.

(iii) The import substitution effects of rapid real exchange-rate devaluation after the crisis helped to trigger high growth and to maintain it, as monetary policy and good fortune prevented the real exchange rate returning to its old levels too quickly, on the back of massive petrodollar inflows.

(iv) Real wages and real incomes accelerated more rapidly than productivity and GDP growth, thus boosting domestic (non-oil) consumption demand, which made import substitution feasible. However, the potential for rapid "catch-up" increases of real wages has now exhausted itself (i.e., real wages can only increase faster than GDP in the future if profits increase by less than GDP).

(v) The experience of high inflation and default led to the inability to raise money on capital markets, which forced a prudent policy of budget surpluses, early debt reduction and exchange rate management. Macroeconomic stability and the newly found incentives for private capital to invest in the private sector were fundamental preconditions for the long-lasting recovery of GDP.

(vi) However, hard budget constraints have not been imposed everywhere. In particular, subsidized domestic energy prices stayed in place as a cushion against brutal cost squeezes immediately after the crisis, and may have fueled growth later on, during the early stages of the recovery. This could have negative long-term consequences. Growth and development could become hostage to energy subsidies, which would diminish the competitiveness of new industries.

60. All told, this leaves us with a total of six identifiable post-crisis effects that contributed to Russia's high growth rates in 1999-2003. Two of them have more or less run their course (assuming that capacity is fully utilized on average, and given that real wage growth has adjusted); one is threatening to run its course sooner rather than later if policy measures are not taken to improve long-term macro management to stabilize the real exchange rate; and one is fickle by nature (oil prices may well remain high over the medium term, but it is hard to credit that they will rise forever). Two post-crisis effects remain in place. One is the ability of the government to finance itself (instead of crowding out private sector investment), achieving budget surpluses and saving part of the high revenues, most recently in the newly established

\textsuperscript{16} The issue has been discussed in more detail in World Bank (2003b), and Gaidar (2003).
stabilization fund. The other is below-cost energy pricing to boost the competitiveness of Russian enterprises. The danger is that government surpluses can be used to subsidize inefficient economic structures, and below-cost energy pricing tends to be misused (as we will see in Part C) in order to keep people and production in locations where they would not otherwise remain, and where they cannot remain forever without imposing a heavy tax on more viable parts of the economy. Both of these post-crisis effects are thus already related to the structural changes in the economy investigated below.

61. This part of the CEM has not aimed to address sources of growth that have originated from structural change, nor has it looked at the potential for structural change to take over from diminishing transitory effects. Part C looks at the five most important areas in which contributions to economic growth have been mobilized from structural change, in order to estimate how much of Russia’s potential has materialized already and to identify the main obstacles to a more effective realization of this potential, including obstacles, that can be removed by reform policies.
C1. SPATIAL REALLOCATION

62. It may still be too early to appreciate the extent of turmoil and dislocation which post-socialist transition has imposed on Russia’s citizens. But one aspect, which receives little attention today, is bound to figure large if the scale of the disruption is ever measured—namely, demography. The macroeconomic trends discussed above are predicated on vast demographic changes, particularly internal migration across the huge Russian space, reflecting the need for spatial resource reallocation to deal with the socialist legacy.

63. Demographic strain in Russia since the dissolution of the Soviet Union has various aspects: decline in life expectancy; severe population decline; increase in international migration; and increase in migration within the country.

64. Figure C1.1 shows two important features of Russia’s demographic change during transition, namely, population decline (the result of various factors) and the net effect of cross-border migration. After a brief discussion of these developments, the remainder of this chapter will concentrate on population movements within Russia.

![Figure C1.1 Russia: Net Migration and Natural Increase, 1980-2002](image)

(a) “Natural” demographic development

65. Despite the well-publicized decline in life expectancy overall and the major increase in the life-expectancy gap between males and females, the main determinant of population decline in the Russian Federation is the birth rate. Preliminary estimates of the first population census

---

17 Life expectancy in Russia approached U.S. levels in the early 1960s and then leveled off, and began to decline for males. Following Gorbachev’s anti-alcohol campaign in the late 1980s, life expectancy briefly rose for both sexes, reducing the gender gap to 9.6 years. However, life expectancy then fell for both sexes in lockstep with measured GDP decline, although faster for men. By 1994 the gender gap had reached 13.6 years. Life expectancy recovered somewhat as GDP stabilized in the run-up to the 1998 crisis, by which time the gender gap had narrowed to 11.6 years. After the crisis the correlation broke down: life expectancy declined (to 58.6 years for males and 72.1 years
since 1989 show a “natural” decline in the population of almost 7.5 million between 1989 and 2002 (Goskomstat 2003b). Figure C1.1 contrasts this with the previous decade (1980-91) when the number of births exceeded the number of deaths by 8.3 million and when, combined with a positive net migration of 2 million, the total Russian population increased by more than 10 million. Since 1987, when the birth rate peaked, the annual number of deaths has increased by 720,000 and the number of births has declined by 1,191,000. Moreover, this trend has accelerated. In each of the last four years the natural population decrease was over 900,000. The fertility rate, having peaked at almost 2.2 in 1987, fell to 1.17 in 1999 before “recovering” to 1.21 in 2000; given a replacement requirement of 2.1, this aggravates existing concerns about the intergenerational, long-term impact of present-day developments.\footnote{66}

66. There can be little doubt that the sudden unraveling of the Soviet Union and its entire social structure, the decline in economic well-being, and the associated increase in uncertainty are mainly to blame for the shorter life expectancy and the decline in the birth rate.

\noalign{\smallskip}
\noalign{\smallskip}
\noalign{\smallskip}
\noalign{\smallskip}

(b) International migration

67. Russia was the richest republic in the USSR, with the exception of the three small Baltic republics, and it was therefore a net receiver of population since 1975 within the closed external borders of the Soviet Union. But when the Soviet Union fell apart, what had been an orderly internal migration within a tightly controlled economic space turned into international migration across porous borders. For most of the 1990s, residents of other FSU states could become Russian citizens easily. Inward migration was driven by former deportees coming home, but people fleeing discrimination or civil strife in ex-Soviet republics (often ethnic Russians), and by people attracted by the relatively favorable economic situation in Russia compared with other republics in the “near abroad.” Russia thus became a migration magnet within the FSU region during the 1990s.

68. Immigrants have prevented a more rapid depletion of Russia’s human resources in more ways than one. In the first place, inward migration mitigated the effects of natural population decline. Based on preliminary results of the first census covering the post-Soviet period (from 1989 through 2002), a net migration of 5.6 million (3.8 percent of the population in 1989) meant that a natural decline of 5 percent (7.4 million) resulted in an overall population decline of only 1.2 percent. Illegal migration is high and notoriously difficult to estimate, which is not the case for natural population growth, since birth and death statistics in Russia are good. The recent census was designed to enumerate illegal and temporary immigration, and shows a population exceeding earlier estimates because of higher immigration figures.\footnote{19} However, the

\footnote{66} Long-term prospects look particularly dire when the potential impact of communicable diseases such as HIV or TB is taken into account. Reversing medium- and long-term population decline is of key importance in view of the threat posed by the unchecked spread of AIDS (Rühl, Pokrovsky and Vinogradov 2003). A simulation model of this impact is available at www.worldbank.org.ru
\footnote{19} According to preliminary census data, Russia’s de jure population on October 9, 2002, was 145,181,900 people, approximately 1.2 million more than previous Goskomstat estimates, implying that Russia’s population had declined by 1.8 million (1.3 percent) since January 1989, and not by 3 million (2.1 percent) as stated by the interim estimates. The bulk of this difference is due to the census revealing higher “permanent” inward migration (Goskomstat 2003b). Previous data on international migration were taken from registered border crossings, and new arrivals do not always admit their intention to settle in Russia. It is worth noting that deviation between census population figures and previous estimates are less in Russia’s case than in the most recent U.S. census, where the census revealed a population of 281 million compared to a prior estimate of 275 million.
number of illegal immigrants is estimated at about 3 million by most observers (including the ILO), exceeding the census estimate and suggesting even more beneficial effects.

69. Immigration is related to the quality of human capital in subtle ways. Migrants to Russia originate largely from the former Soviet Union (FSU). With the exception of Belarus, Russia has had a positive migration balance with all of the FSU republics since 1989. But most residents who have left the Russian Federation since 1989 have gone to three countries outside the FSU, namely, Germany (59 percent), Israel (24 percent), and the United States (11 percent). At 1.1 million, or less than 1 percent of the 1989 population, the sum total of recorded emigrants to countries outside of the FSU is surprisingly small. However, the systematic differences between destination and origin inevitably raise the “brain drain” question: is Russia losing its best educated people, and predominantly those of working age, in whom society has invested the most? Is it receiving less educated populations in return, possibly with a larger share of old people, because of the return of ethnic Russians?

70. Figure C1.2(a) gives a positive message as regards the age of immigrants and emigrants: while the ratio of net migration inflows with FSU states to net outflows with non-FSU states increases as age increases (partly reflecting the wish of many diaspora Russians to retire in Russia), the net population outflows to non-FSU countries in each age group have been more than compensated by net inflows from the FSU.

71. Less data are available on education, but Figure C1.2(b) suggests a similar pattern: in 2002 Russia realized an overall net gain at each education level: whatever it lost to non-FSU economies was over-compensated by equally well-educated inward migration from the FSU. This was due to the frequently overlooked fact that Russia’s diaspora in the neighboring countries includes a disproportionate share of highly educated urban dwellers, and that it is often the better-educated local elites who come to Russia in search of a better economic future. Of course, it is arguable as to what the “net” effect may be, given the different educational standards in different countries. But the overall conclusion – that net immigration has cushioned the blow to Russia’s economic potential from the unraveling of the Soviet empire – is undeniable.

---

20 More than 50 percent of all recorded migrants to Russia since 1989 came from Central Asia, 25 percent from Ukraine, and over 15 percent from the Caucasus. All told, 3.3 million Russians, or 13.2 percent of Russia’s diaspora population in the FSU, returned in 1989-2002, accounting for 36 percent of total registered immigration during that period.

21 In 1995-2002, 43 percent of net migration to the “far abroad” consisted of Russians of German descent, 38 percent were ethnic Russians, and 10 percent were Jewish. An estimated quarter of the Jewish and half of the German population in 1989 had left Russia by 2002.
(c) Internal migration

72. Although international migration and the dramatic decline in life expectancy are important parts of the ongoing massive reallocations in Russia, there is a strong argument that Russia’s medium-term economic prospects are dependent to a much larger extent on the pattern of internal migration.
Figure C1.3(a) Internal Migration: Inter-Census Population Change, 1989-2002

Inter-Census Population Change, January 12, 1989 to October 9, 2002

Percent change, 1989 to 2002

-67.3 to -10
-10 to 0
0 to 9.9
10 to 43.4

Source: Gaskomstat Rossi (www.gks.ru)

Figure C1.3(b) Internal Migration: Net, by Region, 1989-2002

Net Migration by Region in Russia, 1989 to 2002

Population change from migration as a percent of 1989 population

5.4 to 15.5
2.8 to 5.4
-3.7 to 2.6
-9.3 to -3.7
No Data

Source: Gaskomstat Rossi, Demographic Yearbooks.

73. Figure C1.3(a) provides a first hint of the scale of internal migration. It shows the outcome of the new census, displaying the interaction of the three factors which jointly determine the spatial allocation of people across the territory of the Russian Federation: natural population growth, international migration and internal migration. It is immediately clear that the first two factors by themselves cannot explain the regional differentials in population growth.
rates observed over the relatively short period from 1989 to 2002. Figure C1.3(b) focuses on the role of internal migration in shaping the pattern that emerges.

74. The inter-regional movements displayed in Figure C1.3(b) demonstrate that internal migration is the main reason for the population shifts discovered by the census. Most observers would agree that a few stylized facts characterize these recent population movements reasonably well. The most prominent are the following: (i) Russia faces population movements from north to south and from east to west, motivated by warmer climates and better economic prospects in both cases; (ii) a few cities, most obviously Moscow, have population inflows so large that they find it hard to cope; (iii) rural areas are becoming increasingly depopulated (frequent references in the popular press to “ghost towns” offer anecdotal evidence of this); and (iv) the current spatial population movements reflect, in one way or another, adjustments to market coordination, which is to say that they are correcting a structure that evolved under central planning.

75. The scale of these changes and the problems which they present for successful economic adjustment appear to be underestimated.

76. Central planning oversaw the industrialization of Russia but it also, to a large extent, oversaw the country’s urbanization. In the period after World War II there was rapid growth of “artificial” cities, many of them newly founded and located in inhospitable areas to the north and east of Central Russia. In lockstep with shifting people eastward, the Soviet Union entered one of human history’s most rapid phases of urbanization, transforming itself from a mostly rural (and agrarian) society to a mostly urban (and industrial) society. The share of Russia’s population living in urban areas increased from 52 percent in 1959 to 74 percent 30 years later, and many of these new urban centers emerged in the North, Siberia and the Far East.22

77. These changes were so rapid that the mental picture of Russia as an “old” country, compared to the United States for example, may be in serious need of revision. In 1997 Russia had 165 large cities (with populations of more than 100,000), inhabited by a total of 66 million people. In 1959 it had 87 large cities in which 37 million people lived, and in 1939 it had just 50 large cities with 24 million inhabitants. Nine cities, which still have more than 100,000 million inhabitants each in 2003, were created from scratch after 1959.23

78. Figure C1.4 shows the distribution of growth of large cities in four periods. The median is shown as a solid circle, and the interquartile range (cities closest to the median) is defined by the surrounding box. The dashed “whiskers” encompass most of the data, and the open circles beyond that are true “outside values” – points that are distinctly separate from the body of the distribution. As well as highlighting the spectacular growth of new cities, the diagram shows that city growth rates in general slowed period by period, and came to a stop with the population decline of the transition period since 1989. It is also noticeable that the spread of city growth rates decreased over time: there is much less variability in city growth rates in later periods, including the transition period, compared with the earlier socialist periods. In fact, some of the cities that grew most rapidly under central planning are now leading the decline.

---

22 Naturally, these policies were not confined to Russia but encompassed the entire Soviet Union. They included in particular the urbanization of vast swathes of Central Asia.

23 The new cities created since 1959, with their populations in thousands, are: Surgut (275), Nizhnevartovsk (228), Nizhnekamsk (227), Zelenograd (213), Volgodonsk (176), Neftekamsk (115), Novocheboksarsk (123), Seversk (121), and Ust-Ilimsk (103).
79. Overall, the current state of our knowledge is insufficient to offer a rationale for the development of new cities in far-flung locations during the Soviet era. A mixture of strategic, military and economic reasons seems to be most likely—assuming, of course, that the central planner was rational.

80. The rapid creation of cities entailed resettling people to colder climate zones. While the rest of the world grew warmer, in the sense that the population of most other countries moved to warmer climatic zones, Russia grew colder. The substantial economic implications of this shift are gaining more recognition, particularly since the admirable index of average “per capita temperature,” constructed by Hill and Gaddy (2003).

81. However, there is more at issue here than the economic consequences of a decrease in the average temperature in which people lived, or the massive population movements that caused this decrease. Relocation in the Soviet Union went hand in hand with urbanization. Any exodus from these artificial centers will therefore be less predictable than is suggested by the notion of people simply going “back South,” or “back West,” as the case may be. In particular, it is likely to involve new patterns of agglomeration, which are not well understood at present.

---

24 Temperature Per Capita (TPC) is defined as: \( TPC_k = \sum \eta_j t_j \) where \( \eta_j \) is the share of the country’s/region’s total population residing in sub-region \( j \) and \( t_j \) is the average mean temperature in subregion \( j \). The TPC is simply the average of the regions’ temperatures (usually using temperatures for January, the coldest month), weighted by the relative population shares. It is used to measure the population-weighted contribution of a region’s or city’s population to the overall “temperature” of a country.

25 The literature on the issues discussed in what follows is still very sketchy. Gaddy and Ickes (2002) pioneered this research; Ickes (2003) has taken it in a different direction. Meanwhile, the first doctoral dissertation estimating spatial inefficiency and the burden of cold climate has appeared (Mikhailova 2004).
82. Is there anything systematic about the distribution of settlements across the vast space of Russia which arose under central planning? And if so, what are the consequences for economic development and policy making during the transition to market coordination?

(i) The rank-size distribution of cities

83. In all countries the distribution of settlements by size is highly skewed, but there is a surprising regularity in this skew. In many countries the distribution of city sizes is well approximated by a Pareto distribution or inverse power law. This is evident from a plot of the logarithm of city sizes against the logarithm of their ranks (with the largest having a rank equal to 1). On such a graph the points appear to follow a straight line, hence the name "rank-size rule" for this empirical pattern. The pitch and slope of the line correspond to the parameters of a Pareto distribution, and these parameters vary somewhat across countries. The pitch of the line increases with the size of the economy (the intercept is of course the logarithm of the size of the largest city), and the slope of the line, often referred to as "alpha," typically lies between -0.6 and -1.5. When alpha is equal to -1 the rank-size rule is referred to as "Zipf's Law." The city-size distribution for several countries appears to approximately follow Zipf's Law. This more general rank-size rule provides a convenient framework for comparing the size distributions of cities across various countries.

84. Figure C1.5 (a)-(d) provides an example. Ranking cities along the horizontal axis by their size (size is depicted on the vertical axis), the exercise confirms what has been claimed for "Western" economies, which developed organically and were subject to market forces over long periods of time, namely that Zipf's law in general provides a good fit to describe the rank-size distribution of cities in these countries (just as it does to describe the size distribution of plants and factories). It should be emphasized that these cities have emerged and grown over long historical periods, and by and large were not restricted by attempts to determine their size or location, or by severe and persistent controls on access.
85. Figures C1.5(a) and (b) illustrate a tendency in developed market economies for one or two cities at the top end to be “oversized” with respect to the line, which plots most cities in the country. In many cases this includes the capital city.

86. Cities in transition countries also generally follow the rank-size rule, perhaps not surprisingly, since the distribution of city sizes evolved over long periods of time and in this respect the similar structure of transition and market economies is rooted in history (most of which is pre-socialist). Exposure to central planning was shorter in the transition countries of Central and Southern Europe, and none was urbanized under central planning in a way comparable to what happened in the Soviet Union. For most of them, therefore, urbanization occurred in a similar manner and over a similar period as in Western Europe.26
87. Figure C1.5 (c) illustrates one way in which the former socialist economies do typically differ from their Western counterparts. In most of them the largest cities are not oversized outliers but, on the contrary, tend to be smaller than predicted by the rank-size rule. This might reflect the policy, applied in many socialist states, of regulating the privilege of living in the capital, for which permits were usually required and where other restrictions applied. China, as well as European transition economies, exhibits this peculiarity of the largest city being “too small” (Figure C1.5(d)).

88. However, application of the rank-size graph to Russia gives an entirely different result. Figure C1.6 Size Distribution of Russian Cities

89. Russia appears to follow Zipf's law (as the Pareto alpha of -0.97 is roughly equal to -1, see Figure C1.6). However, Russia's plot is made distinctive by the manner in which the largest cities deviate from the line. The two largest cities, Moscow and St. Petersburg, which have both done service as Russia's capital in the last 100 years, are both “too small” in the sense that Zipf's law would predict population figures of about 13 and 7 million (note that the scale in fig. C1.6 is logarithmic). But in Russia, unlike other transition economies, the 11 other biggest cities, with populations from 1 to 1.4 million, are also off the line. Although all of them are large cities, they turn out to be smaller than expected. It seems that Russia is “missing” a number of cities, i.e., large cities with population of between 1.5 and 4 million. Compared with the benchmark of Zipf's law, Russia's second-tier cities are unusually small.

---

27 In the case of China, there have been restrictions on movement as well as attempts to limit the population growth rate. However, socialist planning only started after World War II and has been considerably loosened since 1978. Restrictions on population movement were often temporary (e.g., when city dwellers were forced into the countryside during the Cultural Revolution) and became increasingly ineffective during the last two decades. Overall, the data indicate that, as in most European transition economies, socialist initiatives did not lead to major distortions of the size distribution, which developed historically.

28 Figure C1.6 ranks the 342 cities in Russia with populations over 40,000. It should be noted that the evident deviations from the rank-size rule are also visible if it is applied to the Soviet Union as a whole.

29 Note that Figure C1.6 is based on pre-census Goskomstat data since sufficiently detailed enough data from the 2003 census are not yet available. For Moscow and St. Petersburg in 2000, this implies populations of 8.4 and 4.7 million respectively. The 11 cities with populations between 1 and 1.4 million according to the 2003 census are Novosibirsk (1.43m), Nizhnij Novgorod (1.31m), Jekaterinburg (1.29m), Samara (1.16m), Omsk (1.13m), Kazan (1.11m), Cheljabinsk (1.08m), Rostov (1.07m), Ufa (1.04), Volgograd (1.01m) and Perm (1.00m).
90. An alternative way of expressing this same finding would be to say that Russia, compared to the benchmark, has an unusually large number of cities in the range from 0.5 to 1.5 million inhabitants (the range of cities that lie below the line on Figure C1.6). This observation fits with the “cookie cutter” approach preferred by Soviet planners: naturally, they would not design new cities, scatter their foundations across the landscape and then allow them to grow without limits. Rather, the planned cities were from the start designed for a certain target population size. We will encounter a similar phenomenon when discussing determinants of plant size in the Soviet Union (section C4).

91. A comparison with the rest of the world shows that the standard and relatively small size of Russia’s second-tier cities – or, alternatively, the lack of large agglomerations – is indeed unique to Russia. If we take countries and calculate the ratio of the actual population of their second-tier cities to the population as predicted by the rank-size rule (so that a value of 1 would indicate that there is no deviation from the benchmark) the median values for 23 OECD economies and 28 transition economies are both found to be 0.98. By contrast, Russia’s value is 0.54.

(ii) The economic consequences of spatial reallocation

92. This development of Russia’s cities has a number of implications for the country’s medium-term development and for policies designed to foster economic growth. In particular, a complex range of possible outcomes must be expected if the system is indeed allowed to “let go” (i.e., if decentralized decision making under market conditions prevails).

93. Reaction to the socialist legacy will not consist of a simple dismantling of that legacy: economic development is bound to be path-dependent, shaped by the urban legacy of the socialist past, and there is no theoretical reason to suppose that urbanization in Russia will snap back to the status quo ante. Development is unlikely to be dictated solely by the correction of past distortions, or by climate, or, indeed, by the whole set of factors that were in place before the present distortions were created. The difficulty of predicting the emerging pattern needs to inform the design of economic policy options.

94. The first tendency to be expected under continued decentralized decision-making and market conditions is a powerful trend toward agglomeration, correcting the shortage of large urban centers. But it is difficult or almost impossible to predict where exactly those urban agglomerations will emerge. There is no reason to expect that all of the current second-tier cities depicted in Figure C1.6 will grow until they have the size suggested by the benchmark (i.e., that they will move upward in Figure C1.6 until they meet the diagonal). Nor is it likely that the cities which have been created or nurtured in the “wrong place” will all conveniently shrink until they have the right size (i.e., that they will move down and to the right until they meet the diagonal), and that people will move back en masse to the south and west of Russia to create the missing large urban centers there. History and economics are not likely to proceed in such an orderly fashion.

95. Table C1.1 lists the 60 Russian cities that have seen the greatest contrast in growth between the Soviet era and the recent transition period. Some of these cities were created from scratch in the Soviet era (their Soviet growth figure is asterisked in the table). There are numerous factors behind the growth of cities, many of which would be expected to apply in both periods. This would lead one to expect a positive correlation between growth rates before and after the breakup of the USSR. But it is clear from the table that many cities which grew quickly in the Soviet era have grown more slowly or experienced population declines in the transition period. It is also clear that several rapid growers of the Soviet period are now growing
more slowly than at least half of all large cities, as indicated by comparison with the median rate of city growth in the transition period.

**Table C1.1 Annual Average Percentage Growth Rates of Cities in Soviet and Transition Periods**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nizhnevartovsk</td>
<td>15.34%</td>
<td>-0.06%</td>
<td>3.93%</td>
<td>0.49%</td>
</tr>
<tr>
<td>Naberezhnye Chelny</td>
<td>12.16%</td>
<td>0.13%</td>
<td>3.02%</td>
<td>-0.21%</td>
</tr>
<tr>
<td>Ust-Ilimsk</td>
<td>10.63%</td>
<td>-0.57%</td>
<td>3.02%</td>
<td>-0.20%</td>
</tr>
<tr>
<td>Volgograd</td>
<td>10.16%</td>
<td>-0.40%</td>
<td>1.32%</td>
<td>-1.83%</td>
</tr>
<tr>
<td>Surgut</td>
<td>11.02%</td>
<td>1.01%</td>
<td>3.23%</td>
<td>0.03%</td>
</tr>
<tr>
<td>Toljatti</td>
<td>7.50%</td>
<td>0.76%</td>
<td>2.84%</td>
<td>-0.33%</td>
</tr>
<tr>
<td>Magadan</td>
<td>3.03%</td>
<td>-2.95%</td>
<td>3.13%</td>
<td>-0.05%</td>
</tr>
<tr>
<td>Nizhnevinsk</td>
<td>7.42%</td>
<td>1.19%</td>
<td>2.63%</td>
<td>-0.49%</td>
</tr>
<tr>
<td>Bratsk</td>
<td>6.13%</td>
<td>0.09%</td>
<td>3.35%</td>
<td>0.21%</td>
</tr>
<tr>
<td>Groznyj</td>
<td>1.58%</td>
<td>-4.09%</td>
<td>3.76%</td>
<td>0.63%</td>
</tr>
<tr>
<td>Obninsk</td>
<td>6.30%</td>
<td>0.40%</td>
<td>2.68%</td>
<td>-0.42%</td>
</tr>
<tr>
<td>Odincovo</td>
<td>6.30%</td>
<td>0.54%</td>
<td>2.62%</td>
<td>-0.41%</td>
</tr>
<tr>
<td>Balakovo</td>
<td>5.83%</td>
<td>0.13%</td>
<td>3.46%</td>
<td>0.43%</td>
</tr>
<tr>
<td>Severodvinsk</td>
<td>3.90%</td>
<td>-1.50%</td>
<td>2.64%</td>
<td>-0.33%</td>
</tr>
<tr>
<td>Novocheboksarsk</td>
<td>5.86%</td>
<td>0.65%</td>
<td>3.39%</td>
<td>0.42%</td>
</tr>
<tr>
<td>Velikij Novgorod</td>
<td>4.51%</td>
<td>-0.38%</td>
<td>3.43%</td>
<td>0.50%</td>
</tr>
<tr>
<td>Staraja Oskol</td>
<td>6.40%</td>
<td>1.56%</td>
<td>2.97%</td>
<td>0.09%</td>
</tr>
<tr>
<td>Petropavlovsk-Kamchatskij</td>
<td>3.33%</td>
<td>-1.06%</td>
<td>2.29%</td>
<td>-0.53%</td>
</tr>
<tr>
<td>Cheboksary</td>
<td>4.76%</td>
<td>0.35%</td>
<td>2.22%</td>
<td>-0.59%</td>
</tr>
<tr>
<td>Saransk</td>
<td>4.19%</td>
<td>-0.16%</td>
<td>2.73%</td>
<td>-0.07%</td>
</tr>
<tr>
<td>Uhta</td>
<td>3.82%</td>
<td>-0.50%</td>
<td>1.94%</td>
<td>-0.81%</td>
</tr>
<tr>
<td>Murmansk</td>
<td>2.31%</td>
<td>-1.89%</td>
<td>2.71%</td>
<td>-0.03%</td>
</tr>
<tr>
<td>Cherepovce</td>
<td>4.13%</td>
<td>0.05%</td>
<td>3.57%</td>
<td>0.84%</td>
</tr>
<tr>
<td>Belgorod</td>
<td>4.87%</td>
<td>0.85%</td>
<td>1.98%</td>
<td>-0.68%</td>
</tr>
<tr>
<td>Volzhskij</td>
<td>4.74%</td>
<td>1.03%</td>
<td>2.45%</td>
<td>-0.19%</td>
</tr>
<tr>
<td>Uljanovsk</td>
<td>3.77%</td>
<td>0.12%</td>
<td>3.28%</td>
<td>0.61%</td>
</tr>
<tr>
<td>Nahodka</td>
<td>3.10%</td>
<td>-0.49%</td>
<td>1.62%</td>
<td>-1.00%</td>
</tr>
<tr>
<td>Syktyvkar</td>
<td>3.94%</td>
<td>0.32%</td>
<td>3.04%</td>
<td>0.39%</td>
</tr>
<tr>
<td>Neftekamsk</td>
<td>4.54%</td>
<td>0.96%</td>
<td>2.31%</td>
<td>-0.31%</td>
</tr>
<tr>
<td>Sochi</td>
<td>3.31%</td>
<td>-0.18%</td>
<td>3.01%</td>
<td>0.39%</td>
</tr>
</tbody>
</table>

* Median of 164 large cities: 2.14% -0.07%

**Notes:** Census data, cities with more than 100,000 inhabitants in 2003. Shown are the 60 cities with the greatest change in growth rates between the Soviet period and the transition period, ranked by the change in growth rates between the two periods.

96. Figure C1.4 identified the Soviet era in general as one of rapid urban growth, particularly during periods well before the start of transition. It also showed that certain cities grew at spectacular rates in Soviet times, reflecting planning priorities. These spectacular growth rates are best represented by 23 “outliers,” of which the 11 most extreme are identified by name. The median growth of cities in the transition era has been approximately zero, and the variation across cities has been much less than before.

97. Below, a simple analysis of these data explores the extent to which this pattern of city growth can be “explained.” The basic assumptions are: (i) that each time period (three in the Soviet era and one in the transition era) has its own period-specific effect on urban growth; (ii) that each city has its own idiosyncratic circumstances, which tend to make it grow faster or slower than cities in general in all time periods, a “city effect”; and (iii) that these effects are additive. This simple model accounts for between 40 and 60 percent of the variation in city growth rates in the three Soviet periods, but only for about 25 percent of the variation in city growth rates in the transition period.
growth rates during the transition period. It seems quite likely that the model’s good explanatory power for the Soviet periods reflects the pervasive influence of central planning (the idiosyncratic growth of a particular city might, for example, reflect the central planner’s decision to develop a population center around a new military plant). To gain more insight about the future, it is of interest to consider possible explanations for “lack of fit” in the transition period. These are summarized in Figure C1.7.

**Figure C1.7 “Unexplained” City Growth in Russia**

The three panels in Figure C1.7 show the distributions of the unexplained residuals from three simple models of city growth rates for the transition period (1989 - 2003). The topmost panel shows the distribution of growth rates in the raw data. The middle panel shows the distribution of the residuals from the fixed-period and city-specific effects described above. These residuals are the proportional changes in city sizes after allowance has been made for the specific “city effects” which come mainly from the Soviet era. Fourteen of them are shown to be negative outliers, of which the 7 most extreme are identified on the graph. These are cities that have declined at spectacular rates in comparison with their earlier growth.

The bottom panel reports the distribution of residuals after a regression of the two-way residuals on a number of explanatory factors, namely: latitude, average temperature in January, a measure of remoteness, and the city’s growth in the Soviet era. All of these explanatory variables were statistically highly significant, and they account for over 80 percent of the variation in the two-way residuals of the middle panel. Even so, there are several cities whose relative growth or decline is not captured by the regression, as shown by the named outliers.

It emerges that much of the post-Soviet growth and decline of Russian cities can be explained by the factors just mentioned. Several cities remain as outliers, not explained by the past or by city-specific factors, nor by latitude, temperature or remoteness. They represent the most drastic (and unexplained) break with the past, but they are exceptions to the general pattern of city growth and decline in the transition era, which is largely explained by two broad

---

30 It should be noted that a robust two-way analysis was used, in which the estimated fixed effects are not influenced by extremely aberrant data, allowing any outlying residuals to be clearly revealed.
factors: on the one hand, the unalterable geographic position and climate, and, on the other hand, historical developments under Soviet planning, which are being unraveled in transition.

101. In this context, the 2002 census and annual population data seem to contain one very surprising result: namely, a certain unraveling in recent years of the rapid urbanization of Soviet times. According to the census findings, the total rural population of Russia remained constant in 1989-2003, so that the whole 1.3 percent decline in the Russian population is accounted for by a fall in the urban population. Annual figures also show that the growth of the urban share of the population began to reverse in the late 1990s. Such a decline in the urban share looks puzzling, given the expected tendency toward urban conglomeration.

**Table C1.2 Changes in the Urban Population of Russia by Federal District, 1989-2003**

<table>
<thead>
<tr>
<th>Russian Federation</th>
<th>% change in total population</th>
<th>% change in urban population</th>
<th>Change in urban share (percentage points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Federal District</td>
<td>-1.3</td>
<td>-1.8</td>
<td>-0.4</td>
</tr>
<tr>
<td>North-west Federal District</td>
<td>0.2</td>
<td>2.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Southern Federal District</td>
<td>-8.2</td>
<td>-8.5</td>
<td>-0.3</td>
</tr>
<tr>
<td>Volga Federal District</td>
<td>11.6</td>
<td>2.0</td>
<td>-5.4</td>
</tr>
<tr>
<td>Ural Federal District</td>
<td>-2.0</td>
<td>-2.2</td>
<td>-0.2</td>
</tr>
<tr>
<td>Siberian Federal District</td>
<td>-1.2</td>
<td>-13.7</td>
<td>-11.7</td>
</tr>
<tr>
<td>Far East Federal District</td>
<td>-4.8</td>
<td>-6.4</td>
<td>-1.2</td>
</tr>
</tbody>
</table>

102. The fastest rate of decline in the urban population, according to census findings, occurred in the Far East (Table C1.2), but this was matched by the rate of decline of the rural population, so that the urban share in the Far East remained constant. The same pattern can be observed in the North-west. However, the Ural, which showed the second fastest rate of decline in the urban population, showed the greatest fall in the share of urban population in total population, although the fall was from a very high base in 1989 (92.4 percent). The relatively small rural population in the Ural expanded by a massive 150 percent while the urban population fell by 13.7 percent. In the South, the only region that experienced overall population growth, a small increase in the urban population has been accompanied by a 28 percent growth in the rural sector, and this starting from the highest rural share among the federal districts (37 percent).

103. Can it be that, following decades of decline, the rural sector is undergoing a revival in post-Soviet Russia at the expense of cities? Figure C1.8 gives evidence that this is not the case. The figure combines international and inter-regional migration, but it shows that, except for a few anomalous years at the start of the 1990s, urban centers have remained the chief magnet for migrants throughout transition, and that low-scale net migration from rural to urban areas, which characterized the pre-transition period, certainly resumed in 2001.

---

31 Settlements with at least 12,000 people, out of which no less than 85 percent constitute white collar or black collar employees and members of their families, are considered to be "cities." However, definitions of city-like villages differ in some regions (see Demographic Yearbook, Goskomstat).
104. The apparent anomaly in the 2002 census and earlier population measures during transition has two explanations, which are revealed in Figure C1.9. The first explanation is that of faster natural decline in urban areas than in the countryside because of an older age structure in the former. The other explanation is the reclassification of nearly 1 million urban dwellers as rural dwellers, which occurred, paradoxically enough, because of migration to towns and cities: Russian statistics categorize any settlement with less than 12,000 inhabitants as rural, so that a “borderline” settlement with significant outflow loses its urban status. A total of 905,500 people were reclassified from the urban to the rural category during 1989-2001 without their moving away from home.  

32 The bulk of these administrative changes occurred in just two years, 1991 and 1992.
105. The majority of relocations within regions tend to be from rural settlements to urban settlements: people move from villages to provincial towns or, in remote regions, to the regional capital. In this case the village will remain classified as rural, and the town or city will remain classified as urban. However, people leaving towns appear generally to move on to larger towns (i.e., to migrate from urban center to urban center). This is the most common pattern of relocation across regions. If someone moves across regions from one urban center to another, the classification of the destination does not change but the classification of the origin may change: if enough people leave a shrinking urban district, it will be reclassified as rural.

106. Bearing this in mind, a second look at table C1.2 indicates how the slight fall of the overall urban share can mask larger changes at the regional level. The overall population increase in the Central District can be explained by Moscow’s population gains alone. In the North-west and Volga Districts intra-regional movements roughly balanced losses from outward migration; in Siberia and the Far East, outward migration could not be compensated by intra-regional migration from the countryside to urban centers; the South benefited from a massive influx to its agricultural (rural) areas, particularly in the early years of transition (section C2 below); finally, in the Urals, an initially very high share of urban population (92 percent) fell substantially, most likely owing to both administrative reclassification and outward migration.

---

33 Data collected in several recent regional migration studies support this pattern, was mentioned earlier in World Bank documents (World Bank 2001).

34 Only Belgorod oblast and Moscow city grew between the censuses, by 134,000 and 1,482,000 respectively. Of the 18 regions in the district, 16 actually declined in population. Without Moscow, the district would have recorded a population decline as well.
Box C.1.1 Adjustment of Settlement Patterns

*Northern Restructuring*, a project financed in part by the World Bank project to support the out-migration of people from Russia’s northern regions, provides examples of the importance of design in policies, which aim to facilitate more natural settlement patterns.

The impact of past administrative interventions is still high in Russia’s North, where Soviet planners put large resources into industrial development. People were moved to these zones by force in earlier Soviet history, and in later Soviet periods they elected to tolerate extremely harsh living conditions, remoteness and huge distances in order to be eligible for a comprehensive set of benefits. The North constitutes 57 percent of the territory of the Russian Federation, and in the late 1980s it is estimated to have received subsidization via direct transfers in excess of four percent of Soviet GDP.

Net migration turned negative as soon as economic reform led to a reduction of direct transfers and indirect subsidization (such as “privileged” supply of goods and services, which was important in the USSR’s shortage economy and generous housing programs). Between 1989 and 2001 the population of the North fell from 9.7 to 8.8 million (see figure below).

Net Migration in and out of the Russian North, 1979-2000

Those who leave are generally younger, better educated and have at least a modicum of resources to finance emigration. Those who stay usually have fewer connections in the rest of Russia (referred to by northerners as “the mainland”), are older and are short of savings. Emigration from the north thus tends to make the underlying problems there even worse: as economic liberalization leads to more enterprise downsizing and contraction of the fiscal base of northern municipalities, the costs of supporting the eligible population rises, as do costs of housing and communal services. Municipal (and regional) budgets find themselves under increasing strain.

The *Northern Restructuring Project* was developed and is now testing a number of innovative mechanisms designed to help northern municipalities cope with the impact of transition. Its objectives are social (assisting people to move elsewhere if they wish) as well as structural (improving the fiscal viability of targeted municipalities). Migration assistance is offered to vulnerable groups (disabled, veterans, or pensioners) who want to leave selected municipalities with excess population (Vorkuta, Norilsk and the Susuman district of Magadan oblast). Successful outward migration will be followed by closure of housing and communal infrastructure in order to realize economic and fiscal benefits associated with a smaller population. The economic returns thus generated are expected to cover project costs within seven years.

This project differs from Government resettlement programs in the 1990s in several respects, reflecting lessons learnt from a lack of success. The older programs essentially financed construction in certain target areas, usually in the South of Russia, with the idea of distributing the newly available housing to families on a waiting list. First, the new project replaces this by non-transferable housing certificates as a means of allocating a migration allowance. Second, and particularly important, these housing certificates permit migrants to buy housing anywhere in the Russian Federation outside the North, thus making choice possible. They are not tied to governmental programs to build housing. Third, there is no queuing for participation in the program because the budget is sufficient to cover all potential participants from the eligible categories. Fourth, this assistance for migration is focused on a few municipalities only, thus enabling visible downsizing. Lastly, the project provides migrants with ample information on the options in real estate markets of potential regions of their choice. A web-based housing information system (www.Zhilfund.ru) helps to assess housing prices and availability in potential destinations.

The response to the project confirms the key role of economic incentives. Response is high, for example, in Magadan oblast, where commercialization of gold mining and the introduction of a shift system leave little scope for subsidies. In Norilsk, however, the response rate is low as the municipality is prospering.
Summary and policy implications

107. Russia became an industrialized and urban economy without reliance on market incentives. This explains why the country is likely to experience massive spatial reallocation for some time to come. From an economic point of view, the previous allocation is inefficient, and support of ongoing factor reallocation will help to create conditions for high and sustainable economic growth.

108. Since the beginning of transition, Russia has suffered from adverse demographic developments, experiencing a natural population decline of about 8 million people up to mid-2003 (5.4 percent of the 1989 population). Since the borders were opened at the start of transition, Russia has lost an additional (recorded) 1.1 million people, mostly to developed economies. However, this emigration has been more than compensated by at least 6.7 million immigrants, largely from the FSU. A large share of the immigrants has high levels of education. In the words of Yegor Gaidar (2003), Russia is a “developing economy with developed demographics.”

109. Demographics and international migration alone are insufficient to explain the massive relocation of people currently under way in Russia. Current internal population movements are largely a reaction to the forcible relocation of people to eastern and northern territories under central planning. Cities were erected in inhospitable climates, and there is broad agreement today that the economic gains did not justify this vast uprooting, not even at the time that it was carried out.

110. However, spatial misallocation in Russia goes deeper than having “too many” people living in “too cold” a climate. The urban pattern which resulted from the policies of the last four decades of socialism created an atypical settlement structure: compared with economies where industrialization and urbanization evolved with less interference, Russia seems to be lacking a number of large urban centers. A tendency toward agglomeration is thus likely to become a part of future spatial adjustments. Path dependency will strengthen this trend: central planning turned Russia into a largely urbanized country, and in this respect, any return to the status quo ante is out of the question. Outcomes are unpredictable, except on very short-term horizons, so long as decentralized decision-making is maintained, but it is already clear that the difficulty of predicting the emerging long-term pattern needs to inform the options for the design of economic policy interventions.

111. Short-term internal migration during transition reveals two patterns. First, temperature and remoteness explain the overall dominance of movements from east to west and north to south. Second, people move from the countryside into local towns or regional capitals and from there to larger towns and urban areas – they “go where the jobs are.” These two trends combine into a movement away from the “fringes” of the Russian Federation, in the dual sense of first emptying rural areas in remote regions (mostly in the north and east), as people move to urban areas within these regions, and then emptying these remote regions themselves, as people move on from the remote urban centers to centers elsewhere, typically in the center and the south (the only location where the rural population also increases).

112. This pattern is mainly driven by people following employment opportunities, as confirmed by exceptions to the pattern, which is less uniform than one might suspect. For example, job-creating agricultural activities have prevented decline in some rural areas (e.g., Kabardino-Balkaria), well-paid job opportunities have increased migration into some inhospitable areas (e.g., Norilsk or Uzhno-Sakhalinsk), and there has even been international migration into locally concentrated sectors (e.g., the timber-rush in Karelia). More often than

---

35 One look at Figure C1.3(a) reveals that the pattern described in the previous paragraph is far from uniform.
not, these developments within regions are not (or are insufficiently) reflected in official statistics. 

113. Comparing the size distribution of settlements in Russia to that of countries that have grown organically confirms the suspicion that trends toward agglomeration are likely to emerge over the medium and long term. A priori, there is no reason why new urban centers should not emerge in areas that have not been densely populated before the Soviet urbanization process. Predicting these patterns will require continued surveillance of the economic factors that attract employment into particular locations.

114. The success of policies designed to help optimize the economic effects of migration will thus depend on understanding changes in the structure of employment in Russia. This is the theme of the next section in the CEM. Meanwhile the following policy suggestions, emerging from the current section, deserve to be noted:

- Immigration from the “near abroad” (former Soviet republics) has helped Russia to compensate for outflows of people to developed countries, even if age structure and education levels are taken into account. However, this source of immigration is not inexhaustible. An immigration policy setting rules for the future is desirable, since continued immigration contributes positively to economic growth.

- Encouraging internal migration supports spatial reallocation of human resources: people who move in search of employment enhance Russia’s growth potential.

- By the same token, subsidies designed to support remote locations, including differential pricing for energy or electricity, are a tax on the more viable sectors and regions of Russia’s economy which have to finance them. Such subsidies hamper growth.

- Increased decentralization of taxation and fiscal expenditures to the regional or municipal levels helps to ensure that the actual economic situation of a particular location is most accurately reflected in households’ incentive structure. Creating the right incentives supports the sustainability of growth.

- Surveillance aimed at understanding the newly emerging settlement patterns is a key prerequisite for any intervention.

- Given the state of our knowledge, economic policies, which try to pre-judge the future geographical “winners and losers” of long-term population reallocations run the risk of making costly mistakes and may hamper growth.

- Programs, particularly in education and health care, aimed at helping people who stay on in depressed areas are more cost-effective than programs aimed at developing those locations.

- Lower transaction costs of moving enhance growth prospects. It is thus desirable to fight restrictions that block people’s ability to move. Measures that help

---

36 These observations are based on a series of regional research visits conducted in the summer of 2003.
people to move from declining regions to the destination of their choice could be helpful, but policies that tell people where to go should be avoided.
C2. SECTORAL REALLOCATION

115. Certain stylized facts are longstanding favorites of research in development economics – presumably because of their success in capturing general and central features of economic development. They include the hypothesis that the sectoral composition of market economies – in agriculture, industry, and services – changes in a fairly uniform and predictable way, as these economies develop and grow richer. The hypothesis, in a nutshell, predicts three consecutive stages of economic development: first, the share of agriculture declines; second, the share of industry rises and then stagnates until employment in industry starts to decline; and third, the share of services increases.\(^{37}\) In what follows we will repeatedly refer to this hypothesis as the “stylized facts of development.”

116. This general pattern is highly relevant for an economy like Russia’s for at least two reasons. First, since the development path of socialist economies has not been shaped by market forces, such economies are likely to have ended up with a sectoral structure, which differs from their counterparts at comparable per capita income levels. Therefore, the pattern observed in economies without a socialist past should have some predictive power. Second, Russia is unique, even among former socialist economies, because of its huge relocation problems, discussed in the previous section, and analysis of the sectoral reconfiguration of its economy will help to predict what will drive the relocation of the Russian work force.

(a) Benchmarking Russia

117. Generally speaking, the socialist period in the former Soviet Union and in Eastern and Central Europe was characterized by rapid industrialization and, initially, by rapid growth, with a subsequent slowdown at low levels of productivity. Especially in the USSR, industrialization was supported by an agricultural policy that collectivized agriculture and drove surplus labor into industry. As a result, at the start of transition, the centrally-planned economies found themselves with a larger share of employment in industry and a smaller share in agriculture than market economies with similar income levels. Also, since the planner and not the consumer had been king in these economies, the share of employment in market-oriented services such as trade and finance was low.

118. What would one expect to observe under these circumstances? On average, the share of employment in industry in transition economies decreased significantly and the share of employment in market services increased significantly. Agricultural employment is still lower than in economies with a comparable per capita income but a market history, and the average

\(^{37}\) This analysis was pioneered by Simon Kuznets, a Russian economist who migrated to the United States in 1922, and later by Hollis Chenery, a World Bank economist (for an overview, cf. Petit 1987). Modern explanations of these adjustments rest on differential productivity growth and tastes across sectors: as people grow richer, they consume more manufactured goods and use more services, but they do not eat more. However, the potential for productivity growth is higher in industry and agriculture than in services. As the economy grows, labor moves out of agriculture (fewer people are needed to produce the same volume of food) and the share of agriculture in GDP falls. People initially move into industry, but faster productivity growth in industry than in services is eventually reflected in employees moving out of industry and into services (productivity in industry is high enough to free labor for employment in services). The shares of services and industry in GDP both rise, but the share of employment in services increases continuously whereas the share of employment in industry first rises and then falls (Rowthorn and Ramaswamy 1997).
transition economy also tends to be above the employment benchmark in an additional sector, which can be called “non-market services” (of which more below).  

119. In terms of income per capita, Russia is a middle-ranking transition economy – richer than the rest of the FSU, but poorer than the advanced reformers of Central and Eastern Europe. Like the other transition economies, Russia experienced a large decline in real GDP per capita during the transition and, also, like the other transition economies, it witnessed a large increase in unemployment.

120. To assess how structural change affected Russia, we constructed a benchmark based on the purchasing power income levels (1995) and sectoral composition of 50 market economies. The evolution of Russia’s employment shares in agriculture, industry and services can then be compared with this benchmark. Figures C2.1(a) and (b) report the results for agriculture and industry, and Table C2.1 includes the detailed data.

Table C2.1 Levels ('000 persons), Shares and Growth Rates of Employment 1990-2002 by Sector

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Number</td>
<td>9965</td>
<td>9508</td>
<td>8609</td>
<td>7933</td>
<td>-0.8%</td>
</tr>
<tr>
<td></td>
<td>Share</td>
<td>13.2%</td>
<td>14.4%</td>
<td>13.4%</td>
<td>12.1%</td>
<td></td>
</tr>
<tr>
<td>Benchmark</td>
<td>23.8%</td>
<td>33.8%</td>
<td>33.5%</td>
<td>31.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>Number</td>
<td>31829</td>
<td>22241</td>
<td>19545</td>
<td>19908</td>
<td>-5.8%</td>
</tr>
<tr>
<td></td>
<td>Share</td>
<td>42.3%</td>
<td>33.7%</td>
<td>30.4%</td>
<td>30.3%</td>
<td></td>
</tr>
<tr>
<td>Benchmark</td>
<td>25.9%</td>
<td>23.3%</td>
<td>23.4%</td>
<td>24.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market services</td>
<td>Number</td>
<td>12598</td>
<td>13481</td>
<td>16129</td>
<td>17441</td>
<td>1.1%</td>
</tr>
<tr>
<td></td>
<td>Share</td>
<td>16.7%</td>
<td>20.4%</td>
<td>25.1%</td>
<td>26.6%</td>
<td></td>
</tr>
<tr>
<td>Benchmark</td>
<td>28.2%</td>
<td>23.5%</td>
<td>23.7%</td>
<td>24.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-market services</td>
<td>Number</td>
<td>19092</td>
<td>19215</td>
<td>18961</td>
<td>19213</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Share</td>
<td>25.4%</td>
<td>29.1%</td>
<td>29.5%</td>
<td>29.3%</td>
<td></td>
</tr>
<tr>
<td>Benchmark</td>
<td>22.2%</td>
<td>19.3%</td>
<td>19.4%</td>
<td>19.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n.e.c. (residual)</td>
<td>Number</td>
<td>1840</td>
<td>1505</td>
<td>1083</td>
<td>1155</td>
<td>-2.2%</td>
</tr>
<tr>
<td>Total</td>
<td>Number</td>
<td>75324</td>
<td>65950</td>
<td>64327</td>
<td>65650</td>
<td></td>
</tr>
</tbody>
</table>

Memo item: GDP per capita in 1995 USD

<table>
<thead>
<tr>
<th>GDP per capita</th>
<th>1995 USD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$7,039</td>
</tr>
<tr>
<td></td>
<td>$4,233</td>
</tr>
<tr>
<td></td>
<td>$4,313</td>
</tr>
<tr>
<td></td>
<td>$4,778</td>
</tr>
</tbody>
</table>

Source: Goskomstat and own calculations.

38 These averages hide a substantial degree of variation across countries. Richer transition economies tend to have industry shares above the benchmark, whereas the poorest have, if anything, de-industrialized too much, but have increased their employment shares in agriculture quite dramatically. The richer transition economies find themselves with very low shares of employment in agriculture compared to market economies of similar incomes. Despite becoming poorer still in the transition, the poorer economies actually increased the share of employment in non-market services, and in 2000 found themselves with employment shares in health, education and government well above those found in market economies with similar levels of GDP per capita (Raiser, Schaffer, and Schuchhardt 2004).

39 The comparator countries are Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Canada, Chile, China, Costa Rica, Denmark, Egypt, El Salvador, Finland, France, Germany, Greece, Honduras, Hong Kong, Iceland, Indonesia, Ireland, Israel, Italy, Japan, Malawi, Malaysia, Mauritius, Mexico, the Netherlands, New Zealand, Norway, Pakistan, Panama, Peru, the Philippines, Portugal, Singapore, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Syria, Trinidad and Tobago, Tunisia, Turkey, the United Kingdom, the United States, and Venezuela.
121. As Figure C2.1(a) shows, structural change in Russian agriculture has not been in the direction of the market-economy benchmark. Agricultural employment has fallen in absolute terms during transition, and the decline has accelerated since 1998. The share of agriculture in total employment was surprisingly low at 12 percent in 2002, a level which one would expect to find in an economy with a per capita GDP much higher than that of Russia. However, we know that employment in agriculture actually increased in the early 1990s and that agricultural employment is also one of the major sources of unregistered employment. It is also important that the part of Russian agriculture which is in the official economy has not yet been exposed to market incentives and coordination, because the law on land privatization only became effective after 2001. Clearly, efficiency gains could be achieved by re-integrating the part of agriculture which is in the gray economy and is therefore not visible in the official data, on which Figure C2.1(a) is based.40

122. The share of industry (including construction) in employment has fallen dramatically during the transition, from 42 percent to 30 percent (see Figure C2.1(b)). This decline is even more striking in absolute terms, representing over one-third of industrial employment. As a result, the industry share is now only slightly above the upper range of what is observed in market economies.41 However, during the period of growth starting in 1998-99, employment in industry has grown in absolute terms, at about the same rate as employment in total, with the consequence that the industry share has remained basically unchanged since 1998.

40 World Bank (Forthcoming1) reports agriculture as a major source of employment for the “shadow economy.” Casual observation especially in the thriving agricultural regions of the Caucasus would appear to confirm this suspicion. Regional employment statistics report employment in agriculture at anything between 12 and 30 percent lower than Goskomstat, reporting on the federal level, rendering any comparison with this earlier period difficult.

41 For example, in Turkey and Mexico, two large countries with per capita incomes similar to Russia, the share of employment in industry is around 20-21 percent. The benchmark is about 24 percent.
The situation in Russia with regard to services is best understood via a market and non-market distinction: market (or market-intermediated) services include transport, communications, trade and finance; non-market services (mostly still state-run) refer to housing, health, education and government. The distinction is of interest for several reasons: because market services were underprovided, or even non-existent, under central planning, while non-market services were well-developed; and because the former are driven by market forces while the latter are not, so they can illuminate (via contrast) the impact of market incentives on the speed and extent of structural adjustment. But an additional reason for the distinction is that market and non-market services perform very differently in Russia for reasons not apparent from the data.

The development of market services in Russia has been similar to that in other transition economies (Figure C2.1(c)). Employment in market services has expanded dramatically, in both relative and absolute terms. Even when industrial employment and output were collapsing, employment in market services was growing at a rate of almost 3 percent per annum, and the total increase from 1990 to 2002 was almost 40 percent. The share of market services in total employment was 27 percent in 2002, close to or even exceeding the levels found in market economies with similar income levels. There is reason to believe that this increase will continue in the medium term (as long as the economy grows), because the benchmark for market services (unlike that for industry) continues to slope upwards at medium income levels. Wealthy economies employ 30-45 percent of their workforce in market services.
However, the development of non-market services in Russia must be added to development of agriculture as another example of how structural change does not always proceed in the direction of market-economy benchmarks (see Figure C2.1(d)). Russia has seen a significant increase in the share of non-market services in overall employment: levels of employment in education, health and government administration have remained flat, while total employment levels in the economy have significantly declined, so that the share of employment in non-market services has risen to almost 30 percent. This is about 10 percentage points above the benchmark for market economies and corresponds to the situation in rich Western economies with incomes of more than US$20,000 per capita.

As in the agricultural sector, the sheer numbers do not tell the whole story. The additional employment in non-market services has not been created among civil servants (bureaucrats) at the federal level, as is often speculated, but consists mostly of low-wage labor
hired at the regional level. In particular, poor regions swell their payroll by hiring labor that does not require high skill levels, such as janitors, street cleaners, and workers helping out in hospitals and schools. Usually this is an effort to mop up people released from employment in other parts of the economy who have been unable to find employment in their original sector or profession. To the extent that expansion of the “non-market” segment consists of these types of employment, its real function is to replace the social safety net in the regions. The inability to meet payrolls has not necessarily discouraged regional governments from such a policy: they have requested transfer payments from the federal center, and, at times, of high oil prices, these requests have generally been met.\(^42\)

127. To summarize, at the level of the aggregate economy the largest differences between Russia and a stylized market economy with the same level of income per capita are the large share of employment in non-market services and the small share of employment in agriculture. In both instances, the reasons are Russia-specific (a federal budget awash in cash and the traditional importance of garden plots) and the potential for efficiency gains are significant. Such gains could be realized by bringing unregistered output and employment in agriculture into the official economy, and by avoiding over-employment in low-level jobs, where people are likely to lose their skills, vocational training, and motivation, and become tied to locations that are unlikely to host growing sectors.

(b) Structural change across Russia’s regions

128. This analysis can be extended to cover Russia’s regions. Such extension helps to address two key questions, namely (i) what drives structural change at the regional level? and (ii) how far is the change in the composition of the economy’s main sectors likely to go? Both questions must be answered in order to address the link between structural change and spatial reallocation of factors across regions.

129. To date, the analysis has been descriptive and has measured the “level of development” by GDP per capita (the most commonly used proxy). But the determinants of structural change will of course depend on other coefficients as well. It is possible to investigate these determinants across Russia’s regions because Russia is a large economy with considerable regional heterogeneity.\(^43\)

130. Regional heterogeneity is of interest in its own right. Under central planning, certain regions and cities were singled out for the development of specific industries or general expansion, so that, at the start of transition, the geographical distribution of Russia’s industries and people was distorted in a variety of ways. This was discussed in the previous section. It is clearly of interest to observe changes in the economic structure of the regions as these

\(^{42}\) Gimpelson and Treisman (2002) explain this phenomenon slightly differently, arguing that regions have an incentive to over-hire in the first place because they know that they will be “bailed out” by the federal government, i.e., that they will receive subsidy transfers from the federal authorities to pay wages to these public sector employees at the federally mandated level. But the effect of substituting for the lack of an appropriate social safety net will often be the same.

\(^{43}\) This heterogeneity includes wide variations in income per capita, natural resource endowments, climate, distances to other regions and economic centers, human capital endowments, and policies followed during the transition. At the same time, Russian regions tend to be relatively homogeneous in a number of other dimensions compared to the sets of countries used to investigate the stylized facts of development: not just in the size of the population and labor force, but, more important, in factors such as macroeconomic policy and the macro environment; exposure to (interregional) trade, the institutional environment, relative prices, tariffs, and so forth. This combination of heterogeneity and commonality makes it possible to explore the determinants of structural change econometrically both because the sample is large – data on 70-odd Russian regions covering 12 years – and because the variation observed across regions comes from a relatively narrow set of factors.
distortions gradually disappear. By contrasting structural change in specific Russian regions with the international benchmark established earlier, we can also gain deeper insight into where Russia is going. For this purpose, we construct a simple partial-adjustment model of structural change, using regional data. The structural coefficients make it possible to estimate a "medium-run equilibrium" – i.e., the structure that Russia has been moving toward during the transition period.

(i) Determinants of structural change on the regional level

Both income and economic structure vary considerably across regions in Russia. For example, the share of employment in agriculture varies from near-zero to over 30 percent, in industry and market services from under 15 to almost 40 percent, and in non-market services from 20 to 40 percent (with one region having over half of its employment in this sector). The question of what determines sectoral structure in the regions is addressed by using a reduced-form model to estimate the effects that a variety of parameters had on the employment structure of regions in 1990 and in 2001. The choice of these dates allows comparison of the change in the impact of different factors between the last year of central planning and the most recent year, for which data are available. The parameters are per capita income, latitude, transport infrastructure, education levels, population size of the region, and regional independence (measured by the proxy of whether the region is a republic). The detailed regression results are reported in table C2.2, below.44

Regression results by sectors can be summarized as follows.

- In agriculture, the impact of income on the labor share is significant and negative in both 1990 and 2001. Richer regions have less employment in agriculture, as would be predicted by the stylized facts of development. Latitude has a negative impact on employment in agriculture, as expected. Transportation links have no impact, but there is a strong negative education effect in both years: the more educated the population is, the fewer people are working in agriculture.

- In industry, a weak relationship between employment and regional income is observed in 1990, but none at all in 2001, indicating that the visible relationship in the scatter-plots (see Figures C2.3(a) and (b) is driven by other factors. This is surprising and is indicative of the way in which industrialization was spread across the country. There is a strong positive relationship between latitude and the industrial share of employment in 1990 and in 2001. The magnitude of the coefficient is the same as for agriculture but it has the opposite sign, suggesting that the impact of lower agricultural fertility is to shift employment out of agriculture and into industry. The net impact of improved transport on employment in industry is positive and significant. Transport links raise productivity in industry by making regional exports more competitive, and the job-creating growth of the regional economy is sufficient to compensate for the lack of need for as many workers to produce the same amount of output. A strong negative education effect

44 The regressions use a balanced panel of 70+ regions. Four regressions, one for each sector, are estimated. As is standard in this analysis, the same set of explanatory variables is used in each regression. Moscow is a clear outlier (it is the rich and growing region visible on the right-hand side of Figures C2.2-C2.5 below) and is dropped from the econometric analysis. Because log income and its square both appear in the regressions, a joint test of significance is reported; because this is a quadratic relationship, the sign of the slope of the estimated relationship between income and labor share is reported separately if it is significant. See Brown and Schaffer (2003) for a detailed discussion.
emerges in 2001: regions with highly educated populations employ fewer people in industry.

- In market services, there is a strong positive income relationship in 1990 and 2001, consistent with the high income elasticity of the demand for services claimed by the stylized facts of development. The impact of better transport infrastructure is to reduce employment in market services. This confirms the impact of transportation on industry: good transport links lower the relative price of manufactures (tradables) compared to non-tradable services, so that labor is drawn out of market services into manufacturing. Education has a strong positive impact on employment in market services.

- Finally, in non-market services the impact of education is positive and highly significant in both years, but the coefficient is smaller in 2001. This is consistent with the hypothesis that the recent increase in employment in this sector is due less to an extension of administrative employment than to substitution for the missing social safety net. Further, regions with large populations have relatively smaller non-market service sectors, while republics (a proxy for more independent regions) have a larger share. In both cases the relationship is much stronger in 2001 than in 1990, suggesting that the option to employ the unemployed and demand bail-outs from the federal government becomes less attractive with size, but more attractive with political independence.

133. Salient points in these results relate to the spatial movements discussed in the previous section, as follows:

- Higher latitude (being further north) moves people into industry and non-market services, and out of agriculture.

- Improved transportation moves people into industry and out of non-market, but not out of market, services.

- Better education moves people out of industry and into services (market and non-market).

- Being a republic moves people out of market services, and being large moves people out of non-market services (being small moves people into them).

134. In summary, most – but not all – of the inter-regional variation is in line with the stylized development facts pointed out at the start of this section. This is more true in 2001 than in 1990. With the exception of industry in 2001, the relationship between the income and employment shares in the respective sectors conforms to the stylized development facts. Disaggregating by region therefore shows that the broad pattern of determinants of structural change has stayed constant, although regions are more diversified today than they were in 1991. Armed with these results, we can return to the comparison of Russia’s regions with the rest of the world, and to the question of what can be said about the final destination of the transition changes that have occurred in Russia to date.

(ii) Benchmarking Russia’s regions

135. How are employment adjustments likely to develop in the future? In order to see where Russia’s regions are going in terms of economic structure, a simple partial adjustment framework is used to estimate a reduced-form equation.
136. The basic idea is to construct an equilibrium benchmark to predict how Russia’s regions will adjust in the future if the same parameters that have determined changes in their economic structure between 1990 and 2001 continue to do so. This is basically an attempt to find out, for each sector in each region, what final level its employment share would approach if present economic forces were to continue unabated.

137. Figures C2.2(a) and (b), C2.3(a) and (b), C2.4(a) and (b), and C2.5(a) and (b) plot Russia’s regions in the space defined by regional income per capita (horizontal axis) and employment share by sector (vertical axis). In each figure, two regression lines display the employment share on (log) real income per capita (and its square), one for 1990 (magenta) and one for 2001 (blue). The third (green) regression line is the estimated “medium-run equilibrium” that takes account of the region-specific determinants of the employment shares for each sector, which have just been discussed, and of the speed at which past adjustment has taken place. Almost like a counterfactual, this equilibrium displays what would happen if history continued unchanged. The market-economy benchmark line, which we introduced earlier, is also displayed (red).

138. For agriculture, the partial-adjustment device cannot be displayed, simply because the speed of adjustment over the full 1990-2001 period has been virtually zero (see Figure C2.2(a) and (b)). This makes estimating a partial-adjustment regression for agriculture inappropriate and hence the regression results are not reported. It is highly significant that agriculture has not adjusted: the share of employment in agriculture in Russia has changed little during the period (it finally fell back below its 1990 level in 2001). While the richer transition countries have been reducing their share of agricultural employment and the poorer ones have been increasing it, Russia, as a “middle-income” transition economy, has essentially been treading water.

---

45 The scatter plots were generated with employment data for a sample of 72 regions over the period 1990-2001 (accounting for approximately 98 percent of total Russian employment).
Figure C2.2(b) Benchmarking Agriculture: Russia’s Regions in 2001

Figure C2.3(a) Benchmarking Industry: Russia’s Regions in 1990
139. Figures C2.3(a) and (b) apply the partial-adjustment device (green) to industry. Two points are of interest in the industrial sector. First, the disaggregated figures, like the aggregate numbers used before, show that Russia's regions have come a long way in adjusting to market-economy levels as regards the employment share in industry. Although the share was still above the market economy benchmark in 2001, the trend is clearly in the right direction. Second, the hypothetical medium-run equilibrium to which they are adjusting is very close to the market economy benchmark. Present trends are pushing the Russian industrial sector toward the employment shares observed in economies with similar per capita income levels. In other words, after ten years of transition, a further substantial degree of downsizing in Russian industry can be expected, but adjustment is taking place and is in the right direction. Russia is moving towards a medium-run equilibrium consistent with shares of industrial employment observed in market economies.

140. The market services in Figures C2.4(a) and (b) show a different pattern. First, while the starting point in 1990 across regions was generally well below the market economy benchmark, the regions have now moved very close to this benchmark and have generally established employment shares in market services that are in line with what is observed in other economies that have similar per capita income levels.

141. Second, the medium-term equilibrium benchmark is now somewhat above the market economy benchmark, indicating persistent pressures on the regions to establish a higher share of market services. But since the market benchmark line is based on data from 50 comparator countries, which show a lot of variation in this sector, the medium-run equilibrium line is still in the range observed across a number of market economies. The suggestion of a tendency to high employment levels in market services coincides with estimates that service sector growth in Russia is outpacing the growth of goods production. It reflects a general tendency toward the expansion of non-tradable sectors, which is common to resource-based economies that are subject to real exchange rate appreciation (and is made stronger, in the case of Russia, by compensation for the historic lack of market services).
Figure C2.4(a) Benchmarking Market Services: Russia's Regions in 1990

Figure C2.4(b) Benchmarking Market Services: Russia's Regions in 2001
Non-market services seen in Figures C2.5(a) and (b) show a pattern that is different again. Relative to the market economy benchmark, the share of employment in non-market services started at roughly the level of the other comparator economies in 1990. However, 11 years later the share of employment in this sector has increased across the regions, and the distance from market economies has grown.

An equilibrium based on the fiction that present developments will continue until the system settles down indicates an outcome that is way out of line with market economies. If present trends were to continue, the hypothetical outcome would be about 40 percent of the work force employed in government-sponsored non-market services – surely an undesirable, but surely also an unsustainable, ratio, at least from the macroeconomic point of view. For good reasons, such magnitudes are not approached even by the richest comparator economies.

It is also noticeable that the fitted line, denoting the possible equilibrium positions across Russia’s regions, does not correspond to the relationship between income and employment in market economies. In Russia’s regions, the share of employment in non-market services tends to increase in richer regions (as in other countries) but it also rises sharply if regional income levels fall below a certain threshold. The latter development could not be sustained without subsidies. It is further evidence that poor regions create employment in non-market sectors by substituting the public sector payroll for an ill-functioning social security system.

Three main conclusions emerge from the analysis so far. First, the structure of employment and the direction of adjustment can be explained by economic factors; second, large-scale adjustments in industry and market services are under way which will transform Russia’s economic structure; and third, the most problematic sectors are the ones least exposed

---

46 The 2001 employment share is about 10 percentage points above the market economy benchmark, and the estimated equilibrium is another 5 percentage points or so above that.
to reform and market forces, namely, agriculture (perhaps in part because the 2001 figures predate land privatization) and non-market (public) services.

**Figure C2.5(b) Benchmarking Non-market Services: Russia’s Regions in 2001**

(c) **Sectoral change across regions: Russia and the United States compared**

146. Although it is possible to measure the scale of structural change, interpreting its pace is another matter. Without a comparative context it is hard to say whether the change observed is large or small, fast or slow. Apart from China, Russia is the only large transition country with considerable regional heterogeneity. A comparison of Russia with other large industrialized economies is a potentially fruitful approach. It is reasonable to start from a comparison with the United States.

147. As just discussed, the magnitude of structural change in Russia over the last decade has been considerable. However, the period 1969-2000 was one of considerable structural change in the United States as well. The share of employment in industry halved, the share of agricultural employment fell from an already low level, and employment in services (excluding government) grew enormously.47

148. One way of measuring the regional variation within a country is to measure the difference between the industrial structure of each region and the industrial structure of the national average. For the comparison below, weighted averages have been calculated for 8 sectors and for 51 U.S. and 72 Russian regions, with employment as weights (a large region is given a greater weight than a small region).

---

47 Because of incompatibilities between classification systems, it is impossible to distinguish between market and non-market services in this section in the same way as previously.
It turns out that regional heterogeneity is now considerably greater in Russia than in the United States. To move a typical Russian region to the national average structure, about 11 percent of the labor force would have to change sector, whereas in the United States, it would take only 6 percent. One way of displaying this result is to represent graphically how regions changed their ranking in terms of distance from the national average – in Russia since 1990 and in the United States since 1969.

Figure C2.6(a) Changes in Regional Dissimilarity: Russia 1990-2001

How did the differences between regions and the national average change over time? Figures C2.6(a) and (b) rank regions ascending from the start of the period in the lower half of the figures (1990 for Russia, 1969 for the United States), showing a smooth increase from left to right in both countries. Regions, which are most like the nation as a whole are on the left, while regions which differ most from the national average are on the right. The upper halves of the figures display the distance of the same regions from the national average at the end of the period (Russia 2001, US 2000).

Figure C2.6(b) Changes in Regional Dissimilarity: United States 1969-2000
The figures show greater variation in Russia's economic structure compared to the United States, but also show significant changes in the rankings in both countries. In the United States large differences visible in 1969 had shrunk noticeably by 2000. The most atypical U.S. states in 1969 were as atypical or more atypical, than the most atypical Russian regions in either 1990 or 2000. By 2000, however, the most atypical U.S. states are no more atypical compared to the U.S. average than a typical Russian region compared to the Russian average.

Another way of comparing regional variability across countries is to define the “sectoral distance” of a region. This distance is measured from the region’s current position to its position at some benchmark date, which could be the previous year. The distance measure then tells us the proportion of the region’s employment that would have to be shifted to return it to the benchmark structure. All that is needed to employ this measure for the country as a whole is the weighted average of all regional distances.

Figure C2.7 compares structural change measured annually in this way, contrasting the period 1990-2001 for Russia with the period 1969-2000 for the United States (it is easy to see that switching to 1990-2000 for the United States would only increase the contrast). In the United States, structural change has averaged about 1 percentage point per annum—i.e., about 1 percent of the workforce moved across sectors (these are net figures). The exception is 1975, the year after the oil price shock, when this measure of structural change across all regions averaged about 2 percent.

Figure C2.7 Annual Regional Distance Traveled

In Russia the pattern is bell-shaped. In 1991, regional structural change was equivalent to a net movement of 1.5 percent of the workforce across sectors. This increased steadily during the first part of the “transformational recession” and peaked in 1997 at 4.6 percent. From 1998 the speed of change across sectors slowed down. By 2001, the net movement had declined to about 1.5 to 2.5 percent per annum. So structural change in Russia has slowed down considerably since the 1998 crisis.

Formally, the “sectoral distance” of region $i$ at time $t$ is defined as $D_{it} = \frac{1}{J} \sum_{j} \text{abs}(S_{ijt} - \bar{S}_{jt})$, where regions are indexed by $i$ and sectors by $j$. The weighted average of the individual regional distances is $D_{t} = \sum_{i} w_{it} D_{it}$, where the regional weights $w_{it}$ are the employment shares of the regions in total national employment.
The corresponding cumulative measure seen in Figure C2.8, confirms this result. Over a 31-year period, the United States saw structural change – cumulatively, the regional average net change across sectors was 17.5 percent, which amounts to an average change of 0.6 percent per annum.

The total change in Russia over 11 years has been a substantial 14.5 percent, or about 1.3 percent per annum. In other words, the cumulative rate of structural change in Russia has been double that of the United States. One would expect a higher rate of change in Russia than in the United States, but how much higher is not clear. Most of the change in Russia took place between 1990 and 1998. Movement since 1999 has been quite small and the rate of change has become similar to the U.S. average.

Figure C2.8 Cumulative Regional Distance Traveled

Overall, structural change in Russia over a decade of transition was significant, as would have been expected from the previous discussion. However, to put things in perspective, similar levels of structural change can also occur in a market economy that is not undergoing drastic systemic change. Structural change in Russia was most rapid during the output collapse in the early 1990s, when the economy was shrinking rapidly, and the intuitively most plausible explanation would link this to differential rates of labor shedding in a time of general economic decline (especially in industry), which registers as “structural change.” Another important factor is the role of underutilized capacity during most of the growth years after the crisis (approximately from 1999-2002). Growth supported by underutilized capacity and labor can create rapid productivity changes, but this process of “catching up” is bound to slow down structural change as defined above, because it leaves the inherited distribution of enterprises intact. This allows early and rapid recovery with relatively little progress in structural change, even compared to periods of transitory decline with labor shedding and obviously compared to periods of long-run growth driven by “new” sectors.

It is therefore wrong to blame the slowdown of structural change in Russia since 1999 exclusively on lack of structural reforms. The slowdown is at least partially associated with the peculiar nature of the post-crisis recovery. In the meantime, labor shedding has stopped.

Cumulative measures are employed to arrive at a more accurate measure over longer periods of time, by eliminating the trend from noise. Some of the annual change is noise: sectors “bounce around” and change in a sector during one year can be partly reversed in a subsequent year. Total (cumulative) change between a starting point and an end year does not register such reversals. In Russia, regional sectoral change is also more noisy, with more reversals of previous changes.
in industry and the sector is expanding employment again. The speed of structural change in Russia is currently only slightly higher than in the United States. This may be hard to correct, particularly because of the high costs of moving and the spatial restrictions discussed earlier. The conclusion is inescapable that structural change is proceeding too slowly to generate the rapid transformation which Russia needs in order to complete its sectoral adjustment.

**(d) Summary and policy implications**

159. Russia’s economic structure, starting from a distorted initial position, adjusted well to a more general pattern of economic development. The share of employment in industry has declined and the employment share in market services has increased, suggesting adjustment to the pattern displayed by market economies at similar per capita income levels. Economic policies supportive of structural change are building the foundations of growth by allowing new enterprises to emerge and prosper in the new sectors.

160. Russia’s aggregate adjustment pattern has two peculiarities: a persistently low employment share in agriculture and an exceptionally high share of employment in non-market services relative to the market benchmark. There is evidence that the low employment share in agriculture reflects unregistered economic activities, and that the high share in non-market activities is mainly due to poor regions supplementing an inadequate social safety net by putting the unemployed on the public sector payroll and relying on bail-outs from the federal authorities.

161. A look at the determinants of structural change across Russia’s regions shows that the stylized facts of development (the decline of agriculture, the rise and then the stagnation of industry, the development of market services) broadly continue to hold. With the exception of industry, per capita income is the most important determinant of the structural composition of regional economies, and this relationship has tightened in 2001 compared to 1990, although regions have become more diverse. However, checking and adjusting for the regional determinants of structural change other than per capita income also offers some insights relevant for economic policy.

162. The lack of a relationship in 2001 between per capita income and the employment share in industry is a legacy of central planning, where industrial employment was allocated across regions by decisions unrelated to regional income levels. It seems that the unraveling of the previous system, by scaling down old industrial enterprises, still overshadows the development of new firms. The first candidates for scaling down are the least productive enterprises in regions most open for change, and the determinants of the size of industry will only converge to what is seen in benchmark market economies when a new competitive structure emerges.

163. The data confirm a lack of internal demand (particularly for market services) of remote regions, which are biased toward industrial employment (including natural-resource production). Unlikely to attract new economic activities, these regions are the losers in the spatial reallocation that is driven by economic opportunities.

164. Transportation infrastructure boosts the competitiveness of regions and it prevents the type of unemployment that becomes soaked up in non-market services (i.e., on the public sector payroll).

165. An important factor is that education is displayed as a large supporter of structural change in the right direction. It is known that functioning education systems across countries are
one of the crucial factors determining long-term growth. By boosting structural change, education in Russia also becomes important for the medium term.

166. It is possible to estimate where Russia’s employment structure is headed by imagining that the pace of past developments and the determinants of structural change across the regions will remain unchanged in the future. In that scenario, employment in industry and market services will approach the levels of other market economies, while agriculture will remain very small for a country with Russia’s per capita income. Employment in non-market services would swell to more than 40 percent of total employment, which is unsustainable even for a natural-resource exporter such as Russia.

167. This expansion of non-market services is linked to hydrocarbon revenues, to the extent that the regions obtain transfers from the federal center (essentially oil dollars) in order to pay for their bloated public sector. This is one example of a more general problem, namely, the often-mentioned “curse” of natural resources, revenues from which are easily employed to delay painful structural adjustment, thus increasing the dependency of the economy on those natural resources.

168. Looking at structural change overall and comparing its pace with the pace of structural change in the United States, it is apparent that the process in Russia has slowed down considerably since the 1998 crisis. Clearly, part of the reason is that the “re-allocation” of employment across sectors occurs much more quickly in conditions of rapid economic contraction and job losses, which were observed in the years before the 1998 crisis. It is harder to conduct structural adjustment when the economy is growing in any case (largely owing to huge overcapacity after the years of contraction). But there are limits to growth without major structural adjustment, and complacency must be avoided.

169. The main sources of growth in transition economies other than Russia are new private enterprises, which can expand under competitive conditions and eventually attract resources away from the pool of old enterprises that can no longer compete (or effectively restructure to compete). Economies in transition are characterized by this “race” between the old and the new, with very clear and straightforward implications for the development of productivity and the determinants of their growth potential. By creating and fostering economic activities, which did not exist before, structural change (growth and decline of sectors) allows new enterprises to enter and leaves them space to prosper almost by definition.

170. The key question, however, is to what extent this structural change can increase aggregate productivity. For example, there may be many new enterprises emerging in the market services sector, but we know that service industries are generally less productive than manufacturing. Or there may suddenly be a chance to multiply the numbers of SMEs, but we know that generally, and for good reasons, small enterprises in competitive economies have a lower labor productivity than large enterprises. There is therefore a need for a detailed investigation of the impact that different enterprise segments have on aggregate productivity in order to estimate the impact of structural change on growth versus the impact that can be had by creating new enterprises or restructuring old enterprises within sectors. Such an investigation requires as precise a labor productivity measure as is possible under difficult empirical circumstances.

171. The following policy conclusions, arising from this chapter, should be noted:

* Policies designed to protect employment in old sectors and enterprises are likely to retard growth prospects in the medium and long terms. The same applies to policies that subsidize remote regions, which are unlikely to attract new economic activities.
• Russia differs most from the market benchmarks in the two sectors that have been the least exposed to market incentives. Again, the general lesson is not new: it would suggest that markets are the most effective means of accomplishing the necessary structural adjustment, which reduces the scope for economic growth to enabling markets to work and rules out large-scale industrial policy.

• To the extent that low employment in agriculture and high employment in non-market services prevail, economic policies can realize intertemporal efficiency gains by registering agricultural activities correctly and reducing the abuse of public-sector employment. The former will in the short term merely boost registered growth rates, but will help to create more competitive structures in the future. The latter is necessary to redress a major structural imbalance which acts as a brake on the current aggregate rate of growth and on structural and spatial adjustment, hence future growth (cf. also the sectoral productivity rates in section C3: non-market services have very low labor productivity).

• Policies designed to improve Russia’s education system should be accorded the highest priority in building the foundations for sustainable growth.

• Public investment in transportation infrastructure increases competitiveness and supports growth.

• Paradoxically, growth slows down structural adjustment compared to a situation of economic collapse. Under conditions of growth, it is important to keep budget constraints on old enterprises in force and choose policies designed to improve the creation and growth of new enterprises.

• Improving the investment climate in an all-encompassing sense is, overall, the best way to support economic growth, because it fosters employment shifts across sectors as well as new enterprise creation within sectors.
### Table C2.2 Cross-Section Regressions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log income</td>
<td>-1.034</td>
<td>(0.581)</td>
<td>-0.780</td>
<td>2.947***</td>
<td>0.106</td>
<td>0.213</td>
<td>0.583**</td>
<td>-0.967</td>
<td>0.238</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Log income)^2</td>
<td>0.049</td>
<td>(0.630)</td>
<td>0.042</td>
<td>-0.161**</td>
<td>-0.004</td>
<td>-0.007</td>
<td>-0.034**</td>
<td>0.052</td>
<td>-0.013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latitude</td>
<td>-0.005***</td>
<td>(0.008)</td>
<td>-0.005***</td>
<td>0.004***</td>
<td>0.005***</td>
<td>0.000</td>
<td>0.001</td>
<td>0.001**</td>
<td>-0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>-0.052</td>
<td>(0.254)</td>
<td>-0.020</td>
<td>0.173***</td>
<td>0.161***</td>
<td>-0.076***</td>
<td>-0.071**</td>
<td>-0.015</td>
<td>-0.072</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher</td>
<td>-0.641**</td>
<td>(0.021)</td>
<td>-0.561***</td>
<td>-0.355</td>
<td>-0.616***</td>
<td>0.166**</td>
<td>0.670***</td>
<td>0.746***</td>
<td>0.473***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.022*</td>
<td>(0.073)</td>
<td>0.010</td>
<td>0.017*</td>
<td>0.013*</td>
<td>0.005</td>
<td>-0.000</td>
<td>-0.003</td>
<td>-0.023***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log population</td>
<td>-0.001</td>
<td>(0.947)</td>
<td>0.020*</td>
<td>-0.001</td>
<td>-0.011</td>
<td>-0.007</td>
<td>-0.038***</td>
<td>0.012*</td>
<td>0.027**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Republic</td>
<td>4.90***</td>
<td>(0.011)</td>
<td>8.82***</td>
<td>2.43*</td>
<td>1.32</td>
<td>14.40***</td>
<td>4.44**</td>
<td>1.38</td>
<td>1.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income F stat</td>
<td>(0.096)</td>
<td>(0.275)</td>
<td>(0.006)</td>
<td>(0.001)</td>
<td>(0.588)</td>
<td>(0.016)</td>
<td>(0.258)</td>
<td>(0.288)</td>
<td>0.465</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

p-values based on heteroskedastic-consistent standard errors in ()

* significant at 10%
** significant at 5%
*** significant at 1%

Income F stat is a test of the joint significance of income and income squared.
C3. COMPOSITION OF PRODUCTIVITY CHANGES

172. Movements across sectors influence not only the composition--and so to some extent the geographical re-allocation of Russia's work force--but also the productivity of labor, which in turn determines growth. Measured labor productivity in the Russian Federation has increased since the 1998 crisis (Part B), but obviously there are differences across sectors. These are not only level effects but also differences in growth rates -- in some sectors, such as construction, labor productivity has improved, in others, such as trade, it has declined. Larger aggregates, such as industry or services, also show varying productivity. However, at first glance productivity changes over time are not correlated in any clear-cut way to whether employment in the relevant sector grew or declined.

173. Labor migration across sectors is not the major determinant of productivity improvements in Russia at present. Changes within sectors and the forces that drive them deserve at least as much attention. What drives the productivity enhancing restructuring of old, inherited enterprises, and the job destruction that typically comes with it? And what influences job creation in new, and often growing, firms? These questions have an immediate bearing on economic policy making. However, before they can be explored further, a fundamental measurement problem needs to be addressed.\(^{(51)}\)

(a) Adjusting Russia's value added

174. A study of the size of the oil and gas sectors in Russia's national accounts reveals that value added generated by these sectors in 2000 accounts for only about 8 percent of GDP at basic prices, and yet, according to the same Goskomstat accounts, oil and gas export revenues alone are about 20 percent of GDP. The figures suggest that Russia is a well-developed service economy, where the production of services (49 percent) exceeds the production of goods (40 percent).\(^{(52)}\) Moreover, in terms of value added it appears to be a service economy dominated by market services (37 percent) rather than non-market services (12 percent), but in terms of employment shares, market services (25 percent) lag non-market services (29 percent). This makes the market service sector appear extremely productive by international standards.

175. The solution to this puzzle lies in the widespread practice of transfer pricing and the remaining differences in domestic and export prices on main commodities. Many Russian firms that sell their output via controlled trading companies use transfer pricing, and often to avoid taxes.\(^{(53)}\) For example, a firm will set up a trading company in a Russian region which offers tax privileges (in the past, this has usually concerned profit tax) or where taxation can be avoided by other means. The firm then sells its product to the trading arm at below-market prices, and the trading company sells it to the final consumer at market prices, pocketing the difference. The firm thus uses transfer pricing to move profits from the industrial subsidiary (where output is priced low) to the trading subsidiary (the markup and profits from selling at market prices accrue to the trading firm). The same method could be used by firms facing sector-specific

\(^{(51)}\) Cf. also World Bank (2004b), where the economic consequences of transfer pricing are discussed in detail (UK is used as a benchmark).

\(^{(52)}\) These are shares of total GDP at market prices. The remainder is net taxes on products (11 percent) and a small residual category.

\(^{(53)}\) To a limited extent, transfer pricing can be separated from the desire to minimize taxation. For example, trading subsidiaries may act as profit centers that record the consequences of dual energy pricing between domestic and foreign markets, and also bear the full tax burden. Even in these cases, however, the value added and (windfall) profits are generated by energy production and not trading activity.
taxes that are calibrated to turnover, by shifting the turnover to trading subsidiaries if the latter are taxed at lower rates.

176. The effect on the national accounts is simple and direct: profits and value added are moved from the sector that produces them to the trade sector, thus inflating the trade sector (and with it, the service sector) out of proportion. As a result, according to the official statistics, almost one-quarter of GDP and half of all profits in the economy are generated by the trade sector. The scale of the phenomenon is also clear from comparison between the wage bill and profits in the national accounts. In trade, wages comprise only 8 percent of total value added, and profits almost 90 percent; in the rest of the economy, wages and profits are on average about equal in size.

177. Needless to say, productivity indices calculated on that basis look curiously different from those elsewhere in the world. The high share of value added in the trade sector drives up the figures for the entire market services sector. Elsewhere in the world, market services are less productive than manufacturing. But in Russia (using unadjusted figures), the immense numbers in the trade sector make productivity in market services about 75 percent higher than productivity in manufacturing.

178. The effect of transfer pricing, both in aggregate and by sector, can be estimated by going to Goskomstat’s input-output tables, on which the GDP calculations for the Russian economy are based. The latest of these input-output tables have data on 2000 (Goskomstat 2003a). In the input-output tables the difference between “basic” or producer prices (i.e., what the producer receives) and market prices (what the final buyer pays) is composed of three parts: net taxes on products (indirect taxes), a transport margin, and a “trade margin.” These items together are the difference between the revenues generated by the sale of a product (market prices) and the revenues accruing to the sector that produced them (basic or producer prices). Net taxes on products (VAT, excises, foreign trade taxes, etc.) go to the government, the transport margin goes to the transport sector, and the trade margin goes to the trade sector. Transfer pricing could be used to reduce the basic price received by the producing sector in favor of either the trade or transport sector, depending on which sector the subsidiary of the tax-optimizing firm belongs to, thus inflating trade or transport margins and hence trade or transport sector profits. In Russia, the relevant subsidiaries are in the trade sector, which shows a margin about ten times larger than the reported transport margin. The trade margin is large in aggregate – the equivalent of about one-third of GDP. As one would expect, it is particularly large in the energy sectors: 27 percent of gross output in oil refining, 31 percent in oil extraction, and 63 percent in gas.

179. Goskomstat’s input-output tables include sector-by-sector details of trade margins on intermediate uses and final demand. It is therefore possible to reconstruct GDP “as if” transfer pricing were reduced or eliminated, by recalculating sectoral GDP using smaller trade margins. But what are the “right” margins? The best approach, of course, would be to use product-specific data collected in Russia to estimate the appropriate margins. Until this is done, the best substitute is to use the margins from one or more market economies.

180. We investigated input-output data for Canada (2000), the United Kingdom (1992), the Netherlands (2000), and Norway (2001) (all energy producing countries), and all four of these countries show the same basic pattern. The calculations below use the trade margins for

---

54 “Trade-intermediation margin on intermediate goods” (Torgovo-posrednicheskaya natsenka na ispolozovanniye tovari).
55 We gratefully acknowledge the advice and assistance of the UK Office of National Statistics, Department of Statistics Norway, and of the Input-Output Division of Statistics Canada in making the necessary data available. The reference year of 1992 is chosen for the United Kingdom because the coal sector was still substantial at that time.
Canada for the year 2000. Canada was chosen because, like Russia, it is geographically large and an energy producer, and because the national accounts data available for Canada are sufficiently disaggregated to allow a fairly close match between Canadian and Russian product categories. Table C3.1 presents the trade margins for major product categories using the Russian classification scheme. The margin is calculated as a percentage of total output at purchaser’s prices. For most sectors, the trade margins in Russia are similar to those observed in Canada. For example, machinery has a trade margin of about 15 percent, food processing about 20 percent, agriculture - 5 to 10 percent, etc. The only big exceptions – and they are very big exceptions – are crude oil and gas production: trade margins in Russia are 31 in oil and 64 percent in gas, versus almost zero in Canada.

<table>
<thead>
<tr>
<th>Table C3.1 Trade Margins in 2000: Russia and Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
</tr>
<tr>
<td>Electricity</td>
</tr>
<tr>
<td>Oil extraction</td>
</tr>
<tr>
<td>Oil refining</td>
</tr>
<tr>
<td>Gas</td>
</tr>
<tr>
<td>Coal</td>
</tr>
<tr>
<td>Ferrous metals</td>
</tr>
<tr>
<td>Non-ferrous metals</td>
</tr>
<tr>
<td>Chemicals</td>
</tr>
<tr>
<td>Machinery</td>
</tr>
<tr>
<td>Wood and paper</td>
</tr>
<tr>
<td>Building materials</td>
</tr>
<tr>
<td>Light industry</td>
</tr>
<tr>
<td>Food processing</td>
</tr>
<tr>
<td>Construction</td>
</tr>
<tr>
<td>Agriculture</td>
</tr>
<tr>
<td>Market and non-market services</td>
</tr>
<tr>
<td><strong>Total economy</strong></td>
</tr>
</tbody>
</table>

181. The results of applying Canadian trade margins to the Russian national accounts are reported in the “conversion” Table C3.2, based on the 2000 input-output tables. Although the adjustments required to keep the input-output relationships are complex, the impact on GDP is very straightforward: 13 percentage points of GDP are moved from trade to industry, which rises from 28 percent to 41 percent of GDP. Most of this adjustment (11 percentage points) accrues to oil and gas, which more than doubles in size to 19 percent of GDP. The remainder is distributed across various industrial sub-sectors.

---

56 Approximately 100 product categories for Canada were available for mapping onto 24 Russian categories. All but two Canadian product categories with non-zero margins could be allocated to the corresponding Russian category.
Table C3.2 GDP in 2000 by Sector of Origin: Published GDP versus Adjusted using Canadian Trade Margins (million rubles)

<table>
<thead>
<tr>
<th>GDP by sector</th>
<th>Published GDP</th>
<th></th>
<th>Adjusted GDP</th>
<th></th>
<th>Change in share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VA at basic</td>
<td>Share in GDP</td>
<td>VA at basic</td>
<td>Share in GDP</td>
<td></td>
</tr>
<tr>
<td>Industry – total</td>
<td>2,051,178</td>
<td>28.2%</td>
<td>2,989,202</td>
<td>41.1%</td>
<td>12.9%</td>
</tr>
<tr>
<td>Electric energy</td>
<td>177,872</td>
<td>2.4%</td>
<td>177,734</td>
<td>2.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Oil and gas – total</td>
<td>569,443</td>
<td>7.8%</td>
<td>1,398,701</td>
<td>19.2%</td>
<td>11.4%</td>
</tr>
<tr>
<td>Oil extraction</td>
<td>418,291</td>
<td>5.7%</td>
<td>773,374</td>
<td>10.6%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Oil processing</td>
<td>79,903</td>
<td>1.1%</td>
<td>162,945</td>
<td>2.2%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Gas</td>
<td>71,249</td>
<td>1.0%</td>
<td>462,382</td>
<td>6.4%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Coal</td>
<td>32,080</td>
<td>0.4%</td>
<td>66,549</td>
<td>0.9%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Other fuel</td>
<td>1,397</td>
<td>0.0%</td>
<td>2,011</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Ferrous metals</td>
<td>150,599</td>
<td>2.1%</td>
<td>174,200</td>
<td>2.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Non-ferrous metals</td>
<td>215,792</td>
<td>3.0%</td>
<td>279,395</td>
<td>3.8%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>124,384</td>
<td>1.7%</td>
<td>111,944</td>
<td>1.5%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Machinery</td>
<td>330,042</td>
<td>4.5%</td>
<td>277,157</td>
<td>3.8%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Wood and paper</td>
<td>96,320</td>
<td>1.3%</td>
<td>116,994</td>
<td>1.6%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Building materials</td>
<td>58,284</td>
<td>0.8%</td>
<td>59,254</td>
<td>0.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Light industry</td>
<td>30,483</td>
<td>0.4%</td>
<td>-24,417</td>
<td>-0.3%</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Food processing</td>
<td>217,049</td>
<td>3.0%</td>
<td>319,877</td>
<td>4.4%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Other industry</td>
<td>47,433</td>
<td>0.7%</td>
<td>29,803</td>
<td>0.4%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Construction</td>
<td>436,662</td>
<td>6.0%</td>
<td>448,200</td>
<td>6.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>434,948</td>
<td>6.0%</td>
<td>410,947</td>
<td>5.6%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Trans. and comm.</td>
<td>582,473</td>
<td>8.0%</td>
<td>582,473</td>
<td>8.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Trade</td>
<td>1,986,437</td>
<td>27.3%</td>
<td>1,061,613</td>
<td>14.6%</td>
<td>-12.7%</td>
</tr>
<tr>
<td>Housing</td>
<td>38,711</td>
<td>0.5%</td>
<td>37,974</td>
<td>0.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Health and education</td>
<td>176,987</td>
<td>2.4%</td>
<td>176,987</td>
<td>2.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Science</td>
<td>315,732</td>
<td>4.3%</td>
<td>315,732</td>
<td>4.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Finance and govt.</td>
<td>81,018</td>
<td>1.1%</td>
<td>81,018</td>
<td>1.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>397,098</td>
<td>5.5%</td>
<td>397,098</td>
<td>5.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>GDP at basic prices</td>
<td>6,501,246</td>
<td>89.4%</td>
<td>6,501,246</td>
<td>89.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Imputed financial services</td>
<td>-58,239</td>
<td>-0.8%</td>
<td>-58,239</td>
<td>-0.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Net taxes on products</td>
<td>832,389</td>
<td>11.4%</td>
<td>832,389</td>
<td>11.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>GDP at market prices</td>
<td>7,275,395</td>
<td>100.0%</td>
<td>7,275,395</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Note: “Trade” as defined by Goskomstat in the input-output table and in the table above includes real estate; in the national accounts and in the productivity analysis in the next section, a narrower definition of trade is used and real estate is combined with the rest of finance.

182. The Netherlands, Norway and the United Kingdom (unlike Canada) all report a combined trade and transport margin or “distribution margin.” This is a fairly common practice in national accounting, on the grounds that distinguishing between trade and transport markups is partly arbitrary, but it means that a comparison with the combined Russian trade and transport margins is necessary. The level of disaggregation of margins by product available in the data for these countries is also not as detailed as in the Canadian comparisons. The results are, nevertheless, very clear: once again, margins on non-energy products in Russia are similar to those observed in these market economies, but Russian margins on oil and gas are far higher.57

57 The combined trade and transport margin for food processing, for example (where the mapping of product categories is fairly precise), is 23 percent in the UK, 17 percent in the Netherlands, 19 percent in Norway, and 26 percent in Russia. The margin in light industry is 34 percent in the United Kingdom, 32 percent in the Netherlands, 41 percent in Norway, and 34 percent in Russia. The margins on oil extraction and gas, however, are 4 percent in Norway and virtually zero in the United Kingdom and the Netherlands, but 36 percent (oil) and 64 percent (gas) in
183. As table C3.3 reports, the overall picture that emerges is even more striking if the margins from the three European economies are used: industry (oil and gas) increases to 46 (22) percent of GDP using U.K. margins; to 48 (22) percent of GDP using Dutch margins; and to 43 (20) percent of GDP using Norwegian margins. However, the remainder of our analysis uses the recalculations based on the Canadian trade margins, for the reasons noted above and because the results are relatively conservative compared to those using margins from the other countries.

<table>
<thead>
<tr>
<th>Share in GDP at market prices of</th>
<th>Published GDP</th>
<th>GDP adjusted using margins from:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canada¹</td>
<td>UK²</td>
</tr>
<tr>
<td>Agriculture and forestry</td>
<td>6.0%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Industry – total</td>
<td>28.2%</td>
<td>41.1%</td>
</tr>
<tr>
<td>of which, oil &amp; gas</td>
<td>7.8%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Market services – total</td>
<td>37.2%</td>
<td>24.6%</td>
</tr>
<tr>
<td>of which, trade</td>
<td>27.3%</td>
<td>14.6%</td>
</tr>
<tr>
<td>Non-market services – total</td>
<td>11.9%</td>
<td>11.9%</td>
</tr>
<tr>
<td>All services – total</td>
<td>49.2%</td>
<td>36.5%</td>
</tr>
<tr>
<td>GDP at basic prices – total</td>
<td>89.4%</td>
<td>89.4%</td>
</tr>
<tr>
<td>GDP at market prices² – total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Notes: 1. Trade margin. 2. Combined trade and transport (distribution) margin. 3. Includes net taxes on products and imputed financial intermediation services.

184. The exercise confirms that the largest component of Russian GDP is industrial production and not, as the official accounts suggest, production of services. As discussed in Part B, the true share of the oil and gas sector implies that the Russian economy is more exposed to world movements in energy prices than official GDP figures imply. Another striking implication, however, is the fiscal damage from transfer pricing. Immediate losses to the budget are hard to calculate since the tax relief achieved by individual trading companies will differ from region to region and company to company. But if we suppose, for argument’s sake, that tax-avoiding transfer pricing reduces the effective tax rate on the transferred profits by 15 percent (not implausible, given that combined profit and value-added tax rates are of the order of 40 percent), the scale of the revenue losses to the budget would already amount to 0.13*0.15 = about 2 percent of GDP. Small wonder, then, that the government decided to restrict rights of regional governments to grant profit tax concessions as of January 1, 2004. Some of the legal loopholes have now been closed, but there is still scope for companies to use shell trading companies to avoid VAT and general taxes, and illegal tax schemes are also not unknown.

185. The need to recalculate composition of GDP to account for transfer pricing and differences in domestic and export prices also affects the calculation of labor productivity in Russia’s economy. In particular, labor productivity in trade (where employment is largely in the retail sector) drops from 65 percent above the average to 20 percent or more below average. The changes also have an impact on estimated total GDP growth since the start of the recovery, because on average the sectors that are larger are ones that have been growing faster and hence get a larger weight in total GDP. This effect is small, however: cumulative GDP growth over 1996-2002 would change by less than a percentage point. Official Goskomstat data for aggregate GDP growth are therefore used in this report without adjustment.
Development of productivity across sectors

186. As has been pointed out in Part B, aggregate GDP and employment both started to recover quickly after the 1998 crisis, with GDP growing faster than employment. But in fact, labor productivity, just like other real variables, was not affected very much by the crisis. Declining with the "transformational recession" in the early 1990s, it bottomed out around 1996 (Figure C3.1).

Figure C3.1 Labor Productivity 1990-2002: Broad Sectors

187. Different sectors develop at different speeds, but as a rough guide it is appropriate to group the changes in labor productivity over the course of transition for the economy as a whole into two sub-periods – one of decline (1990-1996) and one of growth (1996-2002). Aggregate labor productivity fell by 27 percent over the first period, and it increased by 19 percent over the second. These are startling numbers and the dramatic turnaround was not confined to the aggregate level.

188. Taking the division into main economic sectors, which was used in section C2, as a starting point, we find that industry moved from a cumulative decline in productivity of 17 percent during 1990-96 to a cumulative increase of 38 percent in 1996-2002; agriculture went from minus 32 percent to plus 48 percent; market services improved from minus 27 percent to plus 11 percent; and even non-market services tagged along, proceeding from a cumulative decline of almost 17 percent to an increase of almost 3 percent.58

189. Tables C3.4(a) and (b) later in the section make available for the first time an adjusted account of the development of labor productivity across sectors in Russia, including estimates of the sectoral employment shares and how they changed over time. Several dimensions need to be distinguished when looking at the data in order to see how exactly structural change translates into productivity improvements and economic growth or, more precisely, to see in which sectors Russia’s sources of growth were located and what to expect.

58 It is remarkable even in this context how resilient employment in this sector was. Acting as a “shock absorber,” non-market services experienced the largest increase in its employment share during the period of decline, 1990-96 (productivity numbers in the public sector, of course, say more about the pay scale of public employees than about their output).
from the interaction between structural change and productivity changes for growth in the future.

190. There is (i) the question of productivity levels (i.e., in which sector is productivity the highest). This has to be distinguished from (ii) productivity changes over time, since productivity is growing in some sectors and declining in others. And to study the complete impact of structural change on aggregate productivity and growth, one needs to add (iii) the effects of employment movements across sectors (i.e., information on which sectors grow and which decline in terms of employment, and at what speed). Finally, (iv) the most important market-driven sectors in the economy (industry and market services) each contain an outlier with much higher productivity and hence a disproportionate impact on the evolution of aggregate productivity. These outliers are oil and gas in industry and financial services in market services.

191. Figure C3.2 indicates relative productivity levels across sectors: industry, which represents the largest share of GDP after the recalculation, has the highest productivity, followed by market services, with agriculture and non-market services exhibiting lower than average labor productivity. The figure also confirms what has been displayed in Figure C3.1: in terms of broad sectors of the economy, industry is the most dynamic. It has bounced back impressively from the long period of decline in the 1990s, when output collapsed to a much greater extent than employment, leading to huge, economy-wide productivity losses. Market services, on the other hand, exhibit a protracted declining trend, notwithstanding a brief and probably transitory improvement after the 1998 crisis. The sector that has staged the most impressive productivity recovery is agriculture, albeit from a very low base.

192. However, the situation in agriculture demonstrates the importance of looking at employment shares and their development over time before drawing conclusions about links between productivity improvements and aggregate economic performance. While productivity in agriculture has been growing explosively, we know from the previous discussion in section C2 that its recorded share in employment, in fact, declined over the period 1996-2002 (by 2.3 percent). And while industry is the largest sector and its productivity is growing quickly, its share in total employment fell by 2.3 percent between 1996 and 2002. By contrast, the market services sector, which is by nature not a leader in productivity growth, continues to attract employment flows (its employment share rose by 6.2 percentage points over the same period). Figure C3.3 displays the growth and decline of employment shares across sectors.

---

59 Note how well these data support the idea that underutilized productive capacity, including labor, played a crucial role in the rapid upswing after the crisis until mid-2002, enabling huge productivity advancements while investment remained stagnant (cf. Part B). By implication, these data suggest that the oil price and import substitution were indeed the key driving force behind the recovery, since they stabilized demand and thus prevented stagnation.
Before we return to the question of where Russia’s overall productivity gains originate, a look at the composition of the largest market-driven sectors is instructive. As we have seen, industry and market services develop quite distinctly: market services exhibit a declining productivity trend, while the trend in industry is upwards. At the same time, market services is the sector with the largest employment gains while industry’s share in total employment has a downward trend.
Oil and gas is the key sub-sector of industrial production in Russia. Goskomstat’s published national accounts do not disaggregate value added by industrial sub-sectors, but it is possible to use the adjusted national accounts for 2000 described above, combined with official growth indexes for industrial sub-sectors, to obtain estimated sub-sectoral GDP for the period 1990-2002. According to these estimates, value added in oil and gas at basic prices was 19 percent of GDP in 2002 (versus 8 percent before the adjustment of trade margins described above). Figure C3.4(a) shows that the contribution of the oil and gas industry to GDP was relatively constant through most of the 1990s, but increased after the crisis and remains an important component of industrial production. Employment in this sub-sector, however, is tiny (less than 1 percent of total 2002 employment), and its productivity is therefore about 30 times higher than the rest of industry. In fact, however, as output in oil and gas increased over the years, its employment levels went up much more rapidly, so that the level of productivity in the most productive segment of industry fell steeply (Figure C3.4(b) and (c)). This has been partly offset by very strong productivity growth in industry outside of oil and gas.

While oil and gas is certainly the most productive and important sub-sector in Russia, it was its output growth (value and volume), not its productivity growth that propelled Russia’s economy forward. It is interesting to note, by indicating particularly meager productivity growth in the gas industry and in oil extraction, the aggregate (i.e., non firm-specific) data used here suggest a productivity wedge between the privately owned and the publicly owned parts of the energy sector, with public sector companies depressing the performance of the sector as a whole.

---

60 The figures on the composition of GDP based on the input-output table alone differ slightly from those calculated using this procedure applied to the annual national accounts because of minor incompatibilities in the source data (nominal GDP is about 0.5 percent larger in the recently published official national accounts than in the 2000 input-output table) and in sectoral definitions.

61 Note that this understates the total contribution of oil and gas to GDP because (as is conventional) the contribution to value added is measured at basic prices. If indirect taxes on oil and gas are included, the total contribution of this sector would increase by 5-6 percentage points of GDP.

62 This increase was driven by oil extraction (not refining) and by employment at Gazprom.

63 Productivity in industry without oil and gas increased by 48 percent in 1996-2002, and fell by 1.4 percent in oil and gas. During the period 1990-96, it fell by 54 percent in oil and gas, and by about 29 percent in the rest of industry.
Figure C3.4(a) Real GDP 1990-2002: Industry, Oil and Gas

Figure C3.4(b) Employment 1990-2002: Industry, Oil and Gas
Market services, the second-largest market-driven sector in Russia’s economy, like industrial production, has one outstandingly productive component--finance, with a productivity level almost five times higher than the rest of the market services sector. However, productivity in finance is coming down much faster than the overall productivity of market services, adjusting to levels more in line with mature market economies. Figure C3.5 shows differences in productivity levels over time (in logarithmic scale, since the absolute differences would not fit this page).
(d) Decomposition of productivity growth in Russia

197. To assess the impact of changes in labor productivity on economic growth, productivity growth must be decomposed. If the level of productivity in any one sector is high, the contribution of that sector to aggregate productivity growth will be large, but this will be offset if productivity growth in the sector is diminishing over time. Also, the contribution of a sector to aggregate productivity growth will be diminished if its share in total employment goes down and will be increased if its share goes up. There are thus a few simple mechanical relationships that will determine the impact of structural change on productivity growth, and therefore, ultimately, on economic growth.⁶⁴

- When decomposing productivity changes, the first effect is the "within effect": it captures the impact of productivity growth within individual sectors on aggregate productivity in the economy.

- The second is the "between effect": it captures the impact of the reallocation of employment across sectors. A positive "between effect" means that aggregate productivity increases either because the sector has a higher than average productivity level and labor is moving into it, or because the sector has a lower than average productivity level and labor is leaving it (and vice-versa in the case of a negative "between effect").

- The third term is the "cross effect": it captures the impact of reallocating employment into sectors with growing or declining productivity. A positive "cross effect" means that aggregate productivity increases because employment moves to sectors with positive productivity growth (or out of sectors with negative productivity growth).

198. Tables C3.4 (a) and (b) display the most important effects. The "total" columns denote the contributions to cumulative productivity growth (or decline) across all sectors. Turning first to the period 1996-2002, industry contributed 13.3 percentage points out of a total productivity growth of 19.2 percent over the period, of which 9.7 percent is unrelated to oil and gas. Agriculture contributed 3.9 percent, and construction 2.7 percent. The contribution of market services to productivity growth over this period is negative (-1.6 percent) and so is, in particular, the contribution of trade (-3.2 percent). The contribution of non-market services is negligible (0.3 percent).

199. These numbers in the tables can be analyzed as follows:

(i) There are large productivity improvements within industrial production, but outside of oil and gas. Productivity growth within the industrial sector (10.1 percentage points) makes by far the largest contribution to overall productivity growth.

⁶⁴ The decomposition of productivity growth used in the text is a minor modification of that introduced by Foster, Haltiwanger, and Krizan, (2001):

\[
\Delta R = \sum_i S_{i,t} \cdot \Delta R_{i,t} + \sum_i (S_{i} - S_{i,t-1}) \cdot (R_{i,t-1} - \bar{R}_{i,t-1}) + \sum_i (S_{i} - S_{i,t-1}) \cdot \Delta R_{i,t} \quad \text{with } R
\]
denoting the level of labor productivity (expressed in rubles per employee), \( S \) denoting labor shares, and the subscripts \( i \) and \( t \) denoting sectors and time, respectively. The change in productivity is normalized by its level to derive the rates of growth.
(ii) Oil and gas made only a small positive contribution to aggregate productivity growth (3.6 percent), because it had a high productivity level to start with and drew in labor from elsewhere in the economy. However, this large and positive “between effect” effect was partially offset by falling productivity within the sub-sector (visible in the negative “within effect”).

(iii) Agriculture made the second-largest contribution to aggregate productivity growth (3.9 percentage points). The larger increase in agricultural productivity, which enabled the sector to contribute a major “within effect” (3.1 percentage points), was driven partly by substantial output growth, but also by the loss of workers to more productive sectors. This downsizing of agricultural employment made for a positive “between effect” (1.3 percentage points) because these workers moved to sectors with higher productivity levels, but it was partially cancelled out by a negative “cross effect” (-0.5 percentage points) because labor was leaving a sector in which productivity was increasing.

(iv) The productivity of market services declined (-1.6 percent), driven partly by falling productivity within the sector. The most productive sub-sector in market services – finance and real estate – offset this by absorbing labor from less productive sub-sectors (a “between effect” of 1.7 percentage points), but in turn this was offset by the low productivity of the large trade sub-sector, which also drew in labor.

200. The main lessons for the period 1996-2002 can be summarized as follows:

- Aggregate productivity growth is driven mostly by productivity improvements within sectors, rather than by labor migration across sectors. It has been advanced mostly by industrial production other than oil and gas.
- Aggregate productivity growth from employment movements across sectors is less important. Reallocation effects are substantial, but they tend to cancel each other out. On the one hand, labor is generally moving into sectors and sub-sectors with high productivity levels, such as oil, gas, or financial services, and out of sectors with low productivity levels, such as agriculture (positive “between effects”). Labor is also moving out of sectors with increasing productivity, such as agriculture and industry excluding oil and gas, and into sectors and sub-sectors with decreasing productivity such as finance and trade (negative “cross effects”).

201. Taking the long view and comparing the periods 1990-1996 and 1996-2002 makes for at least two other important conclusions:

- Productivity growth in the later period has been most pronounced in those sectors that declined most in the previous period. Clearly, “catching up” is important to explain the growth since the crisis.
- During the period of decline, employment movements across sectors on balance had a large and positive effect on aggregate productivity. In the later period this positive effect was smaller and mostly cancelled out.

---

Since the “within” contribution is 14.2 percentage points, and aggregate productivity growth was 19.2 percent, one can say that 14.2/19.2 = 74 percent of productivity growth was generated within sectors.
Given the strong role of productivity improvements within sectors, it becomes more important to investigate what drives restructuring within industries, and in particular what determines productivity growth in industrial production other than oil and gas. With respect to the latter, it is important to look at performance differentials across companies.

(e) Summary and policy implications

Transfer pricing and the remaining differences between domestic and export prices on main commodities lead to a considerable overestimate of the trade sector in Russia’s national accounts. This mainly affects the share of oil and gas in industry, which increases, after recalculation, from 8 to 19 percent of GDP in 2002. It also affects the share of industry in GDP, which increases from 28 to 41 percent in 2002, reassuming its place as the largest sector in GDP. Market services declines from 37 to 25 percent of GDP after the recalculation, and is (with non-market services at 12 percent) the second largest component of aggregate output.

The most important implications of this adjustment for the design of economic policy concern attempts to diversify the economy, and tax collection. The argument in defense of the old system is that legal tax loopholes benefit economic growth in Russia because they trigger investment into sectors that are more productive than the rest of the economy. A final judgment would require more careful study of total factor productivity (and the accessibility of oil and gas reserves), but, based on the data in this section, the argument for tax loopholes fails. While oil and gas is more productive than the rest of Russia’s industry, its productivity growth is declining, and its positive contribution to aggregate labor productivity growth is therefore driven by its absorption of labor from other, and less productive, sub-sectors. With such a small percentage of the workforce active in oil and gas (less than 1 percent in 2002), however, this impact on future growth is likely to remain limited. Moreover, because oil and gas is hugely more productive (and profitable) than the rest of the economy, effective tax collection in that sub-sector is unlikely to impair investment and further growth of the sector. Finally, although we have not discussed this point explicitly, reported unequal tax treatment of firms in oil and gas is of course not likely to have a beneficial effect on the sector’s overall productivity performance. Based on the data in this report, it appears that closing all existing loopholes in the oil and gas industry will not impede aggregate growth in Russia.

There is also an argument that windfall taxation of hydrocarbon profits could finance policies to enhance diversification, since, as has just been argued, more effective taxation is not likely to trigger a decline in oil and gas activity. But the findings of the previous section send a clear message on the prudent use of any such windfall tax revenues. First of all, market-driven sectors consistently outperform non-market sectors, so that transfers to the latter are ultimately harmful. The quasi-fiscal transfers to non-market services that sustain employment in non-viable locations or sectors of the economy discussed in section C2 are an example of such misguided policies. Second, governments generally are bad at “picking winners” and the history of tax and other quasi-fiscal incentives to support particular industries in Russia, for example, via so-called special economic zones, is so far a history of utter failure (special economic zones were quickly mired in corruption). Even fiscal transfers targeted to support certain market industries therefore deserve huge skepticism.

Since the crisis, productivity development has been positive across all market sectors. The largest advances have been in industry, but they are associated with employment losses. Agriculture is seeing the same combination of productivity gains and employment losses. Meanwhile, Russia’s largest generator of jobs – market services and particularly trade – shows declining productivity. As the sectoral configuration of employment in Russia adjusts to
more "normal" patterns, and as the extra productivity gains associated with the early stages of this adjustment evaporate, the need for restructuring within industries, including investment to create new capacity for a more productive work force, increases.

208. However, labor reductions are still the key restructuring mechanism for large parts of Russia's inherited industrial base. This is a complex interaction, in which new jobs created by structural change tend to absorb those made redundant in sectors where productivity on the whole increases as employment is scaled down, and where the marginal productivity of labor is low. It is not yet a process dominated by the creation of new productive capital that could enable more productive sectors, such as industry, to increase employment and productivity at the same time.

209. Part of the job outflow from industry goes into unemployment (registered or not) or is absorbed by other government measures (non-market services). Much of it goes to the gray economy, but how much is an open question, owing to measurement difficulties. Overall, the growth of the economy and of productivity thus far has been more or less "jobless" (employment in Russia fell by 15.3 percent from 1990 to 1998 and grew by only 2.9 percent over the last four years).

210. From all these perspectives - growth, productivity advancements, and the redeployment of labor - restructuring within sectors is at least as significant as that between sectors. It is therefore important to look at the composition of enterprises within sectors, and not only at migration across sectors, in order to study the respective roles of new enterprise growth and old enterprise decline. This is the subject of the next section. The current section generates the following policy implications:

- Closure of the existing (legal and illegal) loopholes in oil and gas industry taxation would not impede aggregate growth in Russia, since oil and gas activities would attract investment even without the loopholes, and attracting more employment into the sector is not a source of productivity gains for the economy in any case.

- Extra tax revenues from the oil and gas sector could be used to foster growth by expanding the overall share of the private sector and curbing public sector employment, which would support efficiency gains from market-driven restructuring. Suitable funding policies could include a general lowering of taxation (not a lowering for particular industries or groups).

- Alternatively, extra tax revenues from the oil and gas sub-sector could be used for policies to support structural change and diversification directly, by providing for infrastructure that is compatible with, and sometimes a prerequisite for, market incentives to become effective. As discussed in section C1 and C2, lowering the costs of moving, building transport infrastructure, and improving the education system should be priorities. Those policies would strengthen sustainable growth because, in contrast to the short-term impact of transfer payments, they induce structural change.

- To the extent that productivity advances in the industrial sector are associated with diminishing employment, economic policy can provide targeted assistance to ease movements out of industrial employment.

- To a considerable extent, the impressive productivity growth in industry since the crisis has been driven by increasing capacity utilization. As this possibility subsides, investment is the only variable that can drive further productivity increases. Diminishing
employment in industry cannot distract from the need to provide a climate conducive to new firm growth in this sector. Along with the tax policies just discussed, this reaffirms the importance of policies designed to create a beneficial investment climate overall.

- In general, the working of this finely balanced system of job creation, job destruction, and labor migration needs to be enhanced and its transaction costs lowered. Trying to freeze or slow these developments would be a mistake. Policy conclusions at this stage therefore need to concentrate on identifying measures that can enhance flexibility, improve skill levels and transferability, and avoid interventions that draw people into the wrong type of employment.
### Table C3.4(a) Productivity Growth Decomposition: 1990-1996

<table>
<thead>
<tr>
<th>Industry</th>
<th>1990 Productivity (R '000)</th>
<th>Productivity growth 1990-1996</th>
<th>Employment share 1990</th>
<th>Employment share 1996</th>
<th>Change in employment share</th>
<th>Decomposition of productivity growth</th>
<th>Within</th>
<th>Between</th>
<th>Cross</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>194.0</td>
<td>-16.9%</td>
<td>30.3%</td>
<td>24.8%</td>
<td>-5.5%</td>
<td>-18.4% 16.1% -7.1% -9.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>6982.2</td>
<td>-54.4%</td>
<td>0.3%</td>
<td>0.6%</td>
<td>0.3%</td>
<td>-10.5% 15.6% -8.6% -3.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other industry</td>
<td>114.8</td>
<td>-28.8%</td>
<td>29.9%</td>
<td>24.2%</td>
<td>-5.8%</td>
<td>-7.8% 0.5% 1.5% -5.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>129.7</td>
<td>-48.9%</td>
<td>12.0%</td>
<td>8.9%</td>
<td>-3.1%</td>
<td>-6.0% -0.1% 1.5% -4.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture &amp; Forestry</td>
<td>60.6</td>
<td>-32.3%</td>
<td>13.2%</td>
<td>14.4%</td>
<td>1.2%</td>
<td>-2.1% -0.6% -0.2% -2.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market services</td>
<td>174.0</td>
<td>-26.8%</td>
<td>16.7%</td>
<td>20.4%</td>
<td>3.7%</td>
<td>-7.9% 3.2% -1.4% -6.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>202.1</td>
<td>-45.5%</td>
<td>6.0%</td>
<td>6.6%</td>
<td>0.0%</td>
<td>-4.8% 0.0% 0.0% -4.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>119.9</td>
<td>-41.1%</td>
<td>1.2%</td>
<td>1.3%</td>
<td>0.1%</td>
<td>-0.5% 0.0% -0.1% -0.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>139.5</td>
<td>-25.8%</td>
<td>7.8%</td>
<td>10.3%</td>
<td>2.5%</td>
<td>-2.2% 0.3% -0.7% -2.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance and real estate</td>
<td>435.8</td>
<td>-15.1%</td>
<td>0.7%</td>
<td>1.8%</td>
<td>1.2%</td>
<td>-0.3% 2.9% -0.6% 1.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other market services</td>
<td>127.0</td>
<td>-20.1%</td>
<td>0.5%</td>
<td>0.4%</td>
<td>-0.2%</td>
<td>-0.1% 0.0% 0.0% -0.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-market services</td>
<td>54.2</td>
<td>-16.5%</td>
<td>25.3%</td>
<td>29.1%</td>
<td>3.8%</td>
<td>-2.5% -0.1% -1.6% -4.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>81.1</td>
<td>-24.4%</td>
<td>4.3%</td>
<td>4.9%</td>
<td>0.6%</td>
<td>-0.7% -0.2% -0.1% -1.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>28.5</td>
<td>-5.5%</td>
<td>5.6%</td>
<td>6.9%</td>
<td>1.2%</td>
<td>-0.1% -1.0% 0.0% -1.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education, culture, art</td>
<td>23.8</td>
<td>-2.3%</td>
<td>9.0%</td>
<td>11.1%</td>
<td>1.5%</td>
<td>0.0% -1.2% 0.0% -1.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government administration</td>
<td>219.0</td>
<td>-46.6%</td>
<td>2.1%</td>
<td>4.0%</td>
<td>1.9%</td>
<td>-1.7% 1.4% -1.5% -1.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other non-market services</td>
<td>46.3</td>
<td>-0.6%</td>
<td>3.7%</td>
<td>2.3%</td>
<td>-1.4%</td>
<td>0.0% 0.9% 0.0% 0.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>34.5</td>
<td>-29.5%</td>
<td>2.4%</td>
<td>2.3%</td>
<td>-0.2%</td>
<td>-0.2% 0.1% 0.0% -0.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total across sectors</td>
<td>126.0</td>
<td>-27.3%</td>
<td></td>
<td></td>
<td></td>
<td>-37.1% 18.6% -8.8% -27.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Growth and levels measured in adjusted 2000 prices; productivity is value added at basic prices per person employed.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Within</td>
<td>Between</td>
</tr>
<tr>
<td>Industry</td>
<td>161.1</td>
<td>38.0%</td>
<td>24.8%</td>
<td>22.5%</td>
<td>-2.3%</td>
<td>10.1%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>3181.7</td>
<td>-1.4%</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.1%</td>
<td>-0.3%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Other industry</td>
<td>81.8</td>
<td>48.4%</td>
<td>24.2%</td>
<td>21.7%</td>
<td>-2.4%</td>
<td>10.5%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Construction</td>
<td>66.2</td>
<td>42.2%</td>
<td>8.9%</td>
<td>7.8%</td>
<td>-1.1%</td>
<td>2.7%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Agriculture &amp; Forestry</td>
<td>41.0</td>
<td>48.1%</td>
<td>14.4%</td>
<td>12.1%</td>
<td>-2.3%</td>
<td>3.1%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Market services</td>
<td>127.4</td>
<td>-10.7%</td>
<td>20.4%</td>
<td>26.6%</td>
<td>6.2%</td>
<td>-2.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Transport</td>
<td>110.1</td>
<td>13.2%</td>
<td>6.0%</td>
<td>6.4%</td>
<td>-0.2%</td>
<td>1.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Communications</td>
<td>70.5</td>
<td>106.7%</td>
<td>1.3%</td>
<td>1.4%</td>
<td>0.1%</td>
<td>1.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Trade</td>
<td>103.5</td>
<td>-21.7%</td>
<td>10.3%</td>
<td>15.9%</td>
<td>5.6%</td>
<td>-2.5%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Finance and real estate</td>
<td>370.2</td>
<td>-22.1%</td>
<td>1.8%</td>
<td>2.4%</td>
<td>0.6%</td>
<td>-1.6%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Other market services</td>
<td>101.5</td>
<td>-9.1%</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Non-market services</td>
<td>45.2</td>
<td>2.6%</td>
<td>29.1%</td>
<td>29.3%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Housing</td>
<td>61.3</td>
<td>-14.3%</td>
<td>4.9%</td>
<td>5.0%</td>
<td>0.2%</td>
<td>-0.5%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Health</td>
<td>26.9</td>
<td>16.8%</td>
<td>6.9%</td>
<td>7.1%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Education, culture, art</td>
<td>23.3</td>
<td>14.9%</td>
<td>11.1%</td>
<td>10.9%</td>
<td>-0.2%</td>
<td>0.4%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Government administration</td>
<td>117.1</td>
<td>-6.6%</td>
<td>4.0%</td>
<td>4.5%</td>
<td>0.4%</td>
<td>-0.3%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Other non-market services</td>
<td>46.0</td>
<td>9.4%</td>
<td>2.3%</td>
<td>1.8%</td>
<td>-0.5%</td>
<td>0.1%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Residual</td>
<td>24.3</td>
<td>39.3%</td>
<td>2.3%</td>
<td>1.7%</td>
<td>-0.6%</td>
<td>0.2%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Total across sectors</td>
<td>91.6</td>
<td>19.2%</td>
<td></td>
<td></td>
<td></td>
<td>14.2%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

Note: Growth and levels measured in adjusted 2000 prices; productivity is value added at basic prices per person employed.
211. Given that the productivity improvements in Russia are likely to continue to be located within sectors, further restructuring within the largest sectors is crucial to unlocking growth. Russia’s development, like that of other transition economies, will probably be dominated by competition between new, initially small and medium-size, but highly productive, enterprises, and old enterprises inherited from the previous system, with lower value added per worker and often in need of downsizing. It is reasonable to suspect that the process will be more difficult in Russia because of first, the huge dominance of industry at the onset of transition (the need to “de-industrialize” discussed in section C2), and second, the spatial reallocation problems pointed out in section C1. The first factor increases the urgent need for restructuring, but the second makes it more costly.

(a) Establishments and firms

212. In addition to the bias towards rapid industrialization, there is a suspicion that the size distribution of enterprises within industry might be heavily skewed. The standard picture is that Russia has an over-concentrated industrial (and also agricultural) sector, with a relatively small number of large plants and production facilities. To have a better grasp of what is at issue, it is useful to introduce a distinction between “establishments” and “firms.” “Establishments” are defined as individual physical production units, whether industrial plants or hairdressers. By contrast, “firms” are legal entities, as understood the world over, which may be spread over many physical locations (with subsidiaries, etc.).

213. Soviet planners preferred large establishments, since a multitude of smaller units was more difficult to organize and increased control and monitoring costs. Minimizing these costs required minimizing the number of inter-industry links in the underlying input-output tables. Planners followed a “cookie cutter” model, and built standardized plants of a particular size. If the output of a particular commodity needed increasing, more standardized plants were constructed. The legal concept of a firm as an independent unit did not exist. Moreover, outside of the sectors directly subordinated to line ministries, multi-plant organizations were rare. While vertical integration between enterprises was fairly standard, Russia still lacks the equivalents of GM, McDonald’s, or Wal-Mart, and, in particular, generally lacks large, horizontally integrated firms such as GE or Siemens.

214. The distinction between establishments and firms survives privatization. Early privatization (i.e., prior to the loans-for-shares operations) was heavily biased toward insiders (managers and workers). The overwhelming majority of production units were incorporated and sold as single firms. The enduring legacy of this is large establishments which are also small firms.

---

66 For a formal theoretical treatment see Rühl and Vinogradov (1996); for a cross country comparison see World Bank (2003c).
(b) Employment and the size distribution of establishments

215. An understanding of size distribution, geographic agglomeration and the strategic motivation for location under central planning is still limited, but it is undeniable that Russia still has large establishments (plants) compared to a Western market economy and that, for several reasons (the early breakup of delivery chains, outdated equipment and lack of demand), their productivity is low. This makes it natural to advocate growth of small and medium-size establishments, a process which is of course connected to the emergence of a new private sector, since small single-establishment firms have the potential to develop into larger multi-establishment firms.

216. Table C4.1 shows the size distribution of Russia’s “establishments” by employment across the entire economy, based on previously unpublished data from Goskomstat’s Labor Force Survey.67 The largest segment of Russia’s work force is still employed in establishments with more than 100 employees. Establishments with between 16 and 50 employees are still larger providers of employment than small or micro units with 15 or fewer employees.

Table C4.1 Distribution of Establishment Size and Employment Growth, 2001-02

<table>
<thead>
<tr>
<th>Establishment size category (by number of employees)</th>
<th>Share of 2002 employment (percent)</th>
<th>Growth rate 2001-02 (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.9</td>
<td>2.1</td>
</tr>
<tr>
<td>2-5</td>
<td>6.4</td>
<td>4.9</td>
</tr>
<tr>
<td>6-15</td>
<td>8.3</td>
<td>1.7</td>
</tr>
<tr>
<td>16-30</td>
<td>10.2</td>
<td>2.6</td>
</tr>
<tr>
<td>31-50</td>
<td>8.0</td>
<td>5.8</td>
</tr>
<tr>
<td>51-60</td>
<td>5.2</td>
<td>9.2</td>
</tr>
<tr>
<td>61-100</td>
<td>10.9</td>
<td>5.8</td>
</tr>
<tr>
<td>&gt;100</td>
<td>44.9</td>
<td>0.4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Source: Goskomstat LFS.

217. However, the most important finding in Table C4.1 is where Russia’s jobs are being created. Most employment growth in 2001-02 was at establishments with between 31 and 100 employees and not in small and micro establishments with 30 or fewer employees. Establishments employing over 100 people were the slowest job creators.68

218. What are the causes of this pattern? Small establishments are still comparatively rare in Russia, and one would expect them to grow in significance as the niche is filled. One also expects growth to be driven by new private sector firms, which start their existence as

67 Goskomstat’s Labor Force Survey (LFS) covers over 250,000 persons annually and is representative of Russia as a whole in terms of both regions and economic sectors. The LFS is a major input (along with enterprise reports and other sources) into Goskomstat’s official figures for total employment in the economy. It is also a source of data that is least likely to be affected by under- or mis-reporting: one of the reasons why the Goskomstat LFS does not include questions about individual incomes is because it might induce mis-reporting and lower response rates. The dataset most commonly used by Western analysts for investigating the Russian labor force and households, the Russian Longitudinal Monitoring Survey (RLMS), has a much smaller coverage and sample size – about 3,000 persons. Unfortunately, LFS data on the size distribution of establishments is not available for the years before 2001, and the LFS does not further subdivide establishments larger than 100 employees.

68 One needs to be a bit careful here: establishments employing just over 100 persons could have laid off workers and then employed just under 100 persons, which would show up as an increase in the number employed in the 61-100 category. However, employment in the next smallest category, 51-60, grew even faster.
small establishments. It is of interest to investigate how regional or sectoral factors are driving the rise of small establishments: small establishments might be located mainly in fast-growing regions, leading to spatial agglomeration; or, even more plausibly, they could be concentrated in particularly fast-growing sectors.

Table C4.2 Employment Levels and Growth by sector, 2001-02

<table>
<thead>
<tr>
<th>Sector (ISIC 3)</th>
<th>Total (2002)</th>
<th>Growth 2001-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Agriculture &amp; forestry</td>
<td>7,458,826</td>
<td>-2.5%</td>
</tr>
<tr>
<td></td>
<td>11.3%</td>
<td></td>
</tr>
<tr>
<td>B. Fishing</td>
<td>166,180</td>
<td>-21.2%</td>
</tr>
<tr>
<td></td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>C. Mining &amp; extraction</td>
<td>1,238,908</td>
<td>-10.4%</td>
</tr>
<tr>
<td></td>
<td>1.9%</td>
<td></td>
</tr>
<tr>
<td>D. Manufacturing</td>
<td>13,032,000</td>
<td>3.4%</td>
</tr>
<tr>
<td></td>
<td>19.7%</td>
<td></td>
</tr>
<tr>
<td>E. Utilities</td>
<td>1,808,890</td>
<td>4.3%</td>
</tr>
<tr>
<td></td>
<td>2.7%</td>
<td></td>
</tr>
<tr>
<td>F. Construction</td>
<td>3,582,421</td>
<td>5.7%</td>
</tr>
<tr>
<td></td>
<td>5.4%</td>
<td></td>
</tr>
<tr>
<td>G. Trade</td>
<td>9,055,339</td>
<td>7.3%</td>
</tr>
<tr>
<td></td>
<td>13.7%</td>
<td></td>
</tr>
<tr>
<td>H. Hotels &amp; restaurants</td>
<td>1,115,383</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>I. Transport</td>
<td>5,922,460</td>
<td>2.9%</td>
</tr>
<tr>
<td></td>
<td>9.0%</td>
<td></td>
</tr>
<tr>
<td>J. Finance</td>
<td>816,166</td>
<td>0.7%</td>
</tr>
<tr>
<td></td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>K. Real estate</td>
<td>2,637,198</td>
<td>15.5%</td>
</tr>
<tr>
<td></td>
<td>4.0%</td>
<td></td>
</tr>
<tr>
<td>L. Public administration</td>
<td>4,586,929</td>
<td>-2.4%</td>
</tr>
<tr>
<td></td>
<td>6.9%</td>
<td></td>
</tr>
<tr>
<td>M. Education</td>
<td>5,868,201</td>
<td>5.5%</td>
</tr>
<tr>
<td></td>
<td>8.9%</td>
<td></td>
</tr>
<tr>
<td>N. Health &amp; social work</td>
<td>4,527,062</td>
<td>-0.3%</td>
</tr>
<tr>
<td></td>
<td>6.9%</td>
<td></td>
</tr>
<tr>
<td>O. Other services</td>
<td>4,240,331</td>
<td>-1.9%</td>
</tr>
<tr>
<td></td>
<td>6.4%</td>
<td></td>
</tr>
<tr>
<td>P. Personal household services</td>
<td>11,911</td>
<td>-14.5%</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>X. Other</td>
<td>2,202</td>
<td>-52.6%</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66,070,407</td>
<td>2.6%</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Goskomstat LFS

219. The intuitively plausible view that (sub-)sectoral patterns in establishment size could be generating the pattern of rapid growth in smaller establishments finds some support in Table C4.2. Mining and quarrying, for example, has very little employment in small establishments and experienced a substantial decline in employment (of more than 10 percent) in 2001-02, a year in which total employment actually increased. Conversely, employment in hotels and restaurants, a sub-sector in which most employment is in establishments employing fewer than 50 people, grew rapidly in 2001-02.
Table C4.3 Employment by Size of Establishment, 2002

<table>
<thead>
<tr>
<th>Sector (ISIC 3)</th>
<th>Percentage employed by size category (number of employees)</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2-5</td>
</tr>
<tr>
<td>Agriculture &amp; forestry</td>
<td>27.2</td>
<td>4.9</td>
</tr>
<tr>
<td>Fishing</td>
<td>14.8</td>
<td>4.6</td>
</tr>
<tr>
<td>Mining &amp; extract</td>
<td>0.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Construction</td>
<td>1.5</td>
<td>4.7</td>
</tr>
<tr>
<td>Trade</td>
<td>12.3</td>
<td>24.0</td>
</tr>
<tr>
<td>Hotels &amp; restaurants</td>
<td>0.9</td>
<td>8.2</td>
</tr>
<tr>
<td>Transport</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Finance</td>
<td>0.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Real estate</td>
<td>1.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Public admin</td>
<td>0.1</td>
<td>3.3</td>
</tr>
<tr>
<td>Education</td>
<td>0.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Health &amp; social work</td>
<td>0.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Other services</td>
<td>4.7</td>
<td>10.5</td>
</tr>
<tr>
<td>Personal h.h. services</td>
<td>63.8</td>
<td>36.2</td>
</tr>
<tr>
<td>Other</td>
<td>5.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Grand Total</td>
<td>5.9</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Source: Goskomstat LFS.

221. The outcome of job creation and job destruction depends on the size of the sector, the distribution of employment between small and large establishments within the sector, and the speed of restructuring (i.e., the speed with which the employment share moves from large to small establishments). In many instances, in particular where new job growth is led by the creation of new and competitive enterprises, the process is again reminiscent of Schumpeter's "creative destruction." The creation and growth of new enterprises leads economic growth and makes downsizing of less productive outfits socially possible (and economically mandatory).

222. More generally, the sectoral incidence of downsizing and growth (for example the rapid growth of services) or regional clusters of growth or decline may influence the otherwise regular and universal pattern of rapid employment growth located in small establishments. To rule out multiple causes of rapid growth of employment in small establishments therefore requires removing the contribution of regions and industry from the observed growth of different categories of establishments, to see if the pattern of rapid growth of small establishments remains.

223. Figure C4.1 illustrates part of this interaction by looking at job creation and job destruction in medium and large manufacturing plants. With 13 million employees or almost 20 percent of total employment, manufacturing is the largest sector in the Labor Force Survey (LFS) (Table C4.2). The sector is heavily skewed toward large plants, with 73 percent of all of its employees working in establishments with more than 100 workers (Table C4.3). At the same time, it displays modest employment growth (3.4 percent in 2002), in line with figures on
productivity and sectoral change earlier in this report (sections C2 and C3). This indicates that, for the first time since the beginning of transition, employment growth can outpace employment decline in this sector, which is traditionally dominated by large units.69

**Figure C4.1 Job Flow Rates in Russian Manufacturing**

![Graph showing job flow rates](image)

**Figure C4.2 Decomposition of Establishment Growth**

![Graph showing decomposition of establishment growth](image)

224. Figure C4.2 presents the results of constructing and subtracting sector-predicted growth rates and region-predicted growth rates, as well as a combination of both. There is a clear inverse U-shaped pattern in employment growth by establishment size: the slowest growth is in the smallest and largest establishment size categories, and the fastest growth is in the intermediate group of establishments, employing 31-100 people. The sector-predicted, region-predicted, and sector-region-predicted growth rates do not show this inverse-U shape; all three show predicted growth rates that are relatively flat, with no peak in the middle category of 31-100 employees. Thus, when any of these three predicted growth rate series is subtracted from

---

69 Figure C4.1 can also be used to check data. It is based on the data from the Registry of Industrial Enterprises, since LFS results do not allow the creation of time-series. The Registry records all medium and large industrial enterprises (including enterprises from the mining sector); for all enterprises with more than 100 employees, the Registry has a number of people employed. Any unusual discrepancy between LFS data, presented in most of the tables in this chapter and the Registry data used to create Figure C4.1, would become apparent at this stage.
the actual growth rates, the observation of small and medium establishments as Russia’s engine of employment growth remains.

225. The most plausible interpretation of this finding is that in Russia, as in other transition economies, the aggregate rate of growth is dependent on the contribution of “old” (inherited) and “new” (post-Soviet) enterprises. By virtue of being starts-ups, most of the latter will be small to begin with. But after a few years one would expect the survivors to be more sizable. The observed growth in small, but not micro, establishments in Russia is consistent with a “maturing” of the SME sector. Rapid growth in micro establishments may have taken place earlier: these micro establishments are now growing into small establishments, and new entry and growth at the micro category has slowed.

(c) Local agglomeration

226. As noted above, little is known about the geographic concentration of industry in Russia. Indeed, this is a current area for research on Western economies as well. One would expect the large size of Russian establishments to generate some geographical concentration by industries. If, for example, all cars are produced in three (large) plants, employment in auto manufacture will automatically be geographically concentrated in the regions that host these plants. But how large is local agglomeration in Russian industry once the concentration generated by establishment size is netted out? And what are the relevant benchmarks?

227. Comparing a newly constructed index of Russian industry with its equivalent for the United States shows Russian industry as less agglomerated than U.S. industry: after netting out the impact of large-size establishments, sectoral employment is more evenly spread across regions than in the United States. There is also a time trend: agglomeration was lower under central planning (i.e., before 1992) than in transition (1992-2001). An example is automotive production, where manufacturers are distributed in a number of areas around the country rather than being concentrated in a single Russian region that is analogous to the Detroit area before foreign direct investment changed the American car industry. This finding squares with what is known about industrialization and urbanization in Russia (see section C1). There was, by design, an attempt at spreading “cookie-cutter”-sized production facilities (and towns) all across the vast space of the USSR. Among the reasons discussed earlier, one plausible interpretation, from the point of view of planning even non-military production facilities, was strategic: the central planner put fewer eggs in one basket (region). And besides, car makers can be turned into tank makers.

228. The initial results suggest that Russia has seen an increase in agglomeration during transition. This is partially explained by downsizing, which is proceeding unevenly across regions. Transition means downsizing, and this may raise the degree of local agglomeration towards the U.S. level. However, transition also means new enterprise growth, and “co-agglomeration” may be emerging. Do sub-sectors in an industry locate near each other? The Russian results are not very surprising. As in the United States, industrial machinery shows very low, and wood and paper shows high, co-agglomeration. Oil extraction and refining will show high co-agglomeration, if the United States is any guide.

70 The point has been made for the United States by Ellison and Glaeser (1997).
71 Ellison and Glaeser (1997) constructed an index of geographical agglomeration for U.S. manufacturing sectors across states which has been used as a benchmark by constructing the Russian counterpart. Their basic finding is that on the 5-digit industry level almost all manufacturing sub-sectors are concentrated, but most of them only slightly. The same agglomeration index for Russian industry has been calculated using data from the industrial registry.
Enterprise consolidation and market structure

229. Analyzing the evolution of market structure, or market concentration, differs from analyzing the concentration of the structure of production. The concentration of the structure of production is measured, as above, either by the size distribution of production units or by the geographic concentration of production. By contrast, the focus in the analysis of market structure is on competition and the potential existence of market power.

230. Once again, analyzing Russia means starting out from a unique situation. As already discussed, Russian establishments (factories and other production units) are relatively large and the degree of establishment concentration therefore is relatively high in comparison with Western standards. However, the Russian mass privatization program (excluding a few notable cases such as Gazprom or the national electricity provider RAO UES) was initially designed to transfer single (large) establishments into private hands as single-plant firms. As a result, Russian firms are small compared to Western companies. This generated a peculiar starting point for Russian market structure: namely, a low degree of firm concentration. In other words, at the start of transition markets were not highly concentrated because there were few multi-plant firms.

231. In addition, there was the “cookie-cutter” approach to industrial development under central planning: the planners commonly chose a fixed size for all factories in a particular industrial activity, and then built as many such factories as were thought necessary. As the “market” (turnover) for this particular output increased in size, the planners would construct more standard-size factories. Since Russia was essentially a closed economy, enterprises did not face any direct comparison with foreign firms in the same line of business.

232. One obvious implication for the evolution of markets in Russia is that one would expect a rapid growth of small (single-plant) firms at the lower end of the size spectrum throughout the economy (including start-ups), as discussed in the previous section. Ceteris paribus, this will reduce concentration. We do, in fact, observe this. Analogous to what has been discussed in the previous section for the economy as a whole, data on the distribution of establishment size can be calculated for industry. The results show a noticeable increase in the scale of employment in smaller establishments between the start of transition and 2001, matching very closely the previous results for the economy as a whole (Figure C4.3).\textsuperscript{72}

\textsuperscript{72} The calculations in Figure C4.3 are based on data from the industrial registry and other Goskomstat sources (it is impossible to track the development over time for the rest of the economy because the LFS data on establishment size are available only for 2001-02). However, the data for 2001 closely match the LFS data.
The share of industrial employment in small and micro production units (<101 employees) has grown very substantially – as it has in other sectors of the economy – from an extremely low figure of 2.1 percent in 1985 to 26.4 percent in 2002 (from the 2002 LFS). This is approaching the U.S. level (31.4 percent). However, the rest of the size distribution in Russia is far from the U.S. distribution, although it is moving in that direction: employment in industrial establishments with 100-500 employees is still low in Russia, and employment in the largest category, establishments with 2,500 employees or more, fell from an extremely high level in Russia prior to the transition (49.1 percent) to a still-high level (29.3 percent in 2001) compared to the United States (8.8 percent). Clearly, the further growth of new firms and SMEs in industry and the downsizing of old and very large establishments must be expected to continue in the future.

Compared to the United States, Russia had very few large firms at the start of transition and after privatization. Figure C4.4 confirms that Russia still lacks large firms. If
Russia is to move to a Western market structure, one would expect to see horizontal integration and mergers taking place in the course of transition. Such a process of mergers and acquisitions has indeed driven much of Russia's recent enterprise restructuring and market consolidation.

235. Key determinants of the structure of markets include the fixed costs of production (industries with very large sunk costs tend to be concentrated), the size of the market (large markets tend not to be concentrated), and the homogeneity of the product (markets for very homogeneous products tend to be very competitive and highly concentrated).  

236. Figures C4.5(a) and (b) depict 31 markets (5-digit industrial classification level) collected as part of the ownership data project carried out for this CEM (see section C.5) and give an idea of the extent to which market concentration in Russia changed from the start of transition to the market structure observed today. Sub-sectors were chosen on the basis of size: they are the largest markets in industry and account for about three-quarters of total industrial output. When visualizing market size in Figures C4.5(a) and (b), one needs to keep in mind that the size of markets in absolute terms (real sales) has fallen dramatically, owing to the recession in the early 1990s. 

237. As in previous sections, graphical analysis is used to display the dynamics of change in market structure. Figures C4.5(a) and (b) compare firm concentration in 1991 and 2001. In 1991 firms in 29 of the 31 markets were single-plant firms. The exceptions were gas and electricity, which were (and remain) near-monopolies. The difference between firm concentration in 2001 and in 1991 is largely the result of horizontal integration.

238. Over time, one would expect the emergence of large multi-plant firms at the upper end of the (firm) size spectrum. In other words, the emergence of large individual owners with significant ownership positions on a national scale and the creation of business empires reflect a market-driven process of horizontal integration. Ceteris paribus, this will increase concentration. So the question is whether big business will be able to "corner" markets to such an extent that horizontal conglomerates control most or all of the national economy? Or will they continue to face continued domestic competition (including from each other)?

---

73 Concentration is measured below using the 4-firm concentration ratio, i.e., the share of market sales accounted for by the top 4 firms. Market size is the total sales of all firms in the market divided by the output of the median establishment, a standard measure in this literature.

74 If market size in 1991 were measured using the median 1991 firm, and market size in 2001 using the median 2001 firm, this measure of "market size" could easily show that the size of a market increased during transition even though there was a large fall in sales in real terms. This could occur because the sales of the median firm fell more than total market sales. An additional complication is that the median firm under central planning was a measure of the standard "cookie" size rather than a proxy for minimum efficient scale. This issue is addressed by using the median 2001 establishment to measure market size in both 2001 and 1991, i.e., we normalize market sales in 1991 and 2001 (in 2001 rubles) by the sales of the median establishment in that market (also in 2001 rubles). The result is a measure of market size that reflects the recession – market size goes down between 1991 and 2001.

75 The 2001 figure uses sales and market size data from 2001 but information on the plant composition of firms from 2003. This is an unavoidable limitation of the ownership survey; see section C.5.
239. The “cookie-cutter” approach under central planning leads to the prediction that a plot of establishment concentration (vertical axis) versus market size (horizontal axis) should yield a line. The reason for this is that, under central planning, if a market grew in total sales the planners would produce more standard-size factories. Consequently, a “market” that grew a lot would have a low degree of concentration (the largest 4 establishments would account for a small fraction of total sales) and would show a large market size (measured by total sales normalized by the size of the median establishment, which in this framework is the size of the “cookie”). At the start of transition, establishment concentration is equivalent to firm concentration; subsequent horizontal integration raises firm concentration.

240. With the exception of the two multi-plant monopoly sectors—gas and electricity—the scatterplot of industries in 1991 traces a downward-sloping line, and the upper right-hand quadrant and the lower left-hand quadrants are both almost empty. The prediction for the 2001 concentration ratios would be of a general increase as consolidation and horizontal integration start to kick in. The upper right-hand quadrant should fill up because sectors with a large market size may or may not be highly concentrated. The diagram for 2001 shows that this prediction is largely fulfilled. While there are no sectors that combine a small market size with low concentration, sectors with a large market size display both low and high concentration levels.

241. These changes are almost entirely driven by horizontal integration, while the changing distribution of establishment size has only a minor impact. In some sectors concentration increases as a result of changes in market size during the transformational recession; in a few it decreases; but the major impact on concentration is a vertical movement between 1991 and 2003.
After a decade of transition, horizontal integration and enterprise consolidation are processes driven by economic forces in much the same way as elsewhere in the world. In Russia this tendency has been associated with the growth of business empires and has been driven by large financial-industrial groups. For this reason, and because of the reputation of the privatization process, questions of market concentration inevitably become intertwined with the question of ownership concentration. There is concern that the accumulation of firms by large owners and their business groups will lead to monopolistic market control. But this threat has not yet been realized — at least not in most sectors or across the economy as a whole.

Increasing competition — both by raising the attractiveness for foreign investors (FDI) and by allowing imports to compete in the market place — is the best mechanism for avoiding monopolization, either by companies or by groups controlled by a few individuals. The implementation of stringent anti-monopoly legislation seems the appropriate second measure to safeguard the fragile process of consolidation and enterprise restructuring during transition. Concentrated ownership gives economic benefits when it enables the effective control of individual firms, but not when it refers to the ownership of a large part of the nation’s wealth by a few individuals. These questions will be addressed in the following section.

(e) Summary and policy implications

The analysis of job numbers and job creation in production units of varying size shows that the majority of new jobs are created in the small and medium-size enterprise segment and not in the micro segment. This phenomenon is general across sectors and regions.
Causality presumably runs from establishment size to growth, with (sub-)sectors made up of many small establishments growing rapidly and sectors with employment concentrated in large establishments growing more slowly or shrinking. The creation and growth of new enterprises leads economic growth.

245. Data on the spatial clustering of enterprises indicate that clustering is declining as the rigid spatial distribution of production breaks down and more diversified economic activities appear across the regions.

246. The experience of agglomeration in other countries suggests that Russia is in the very early stages of dissolving existing structures and introducing a minimum of new activities (such as some market services) across all regions, but the Russian economy has not yet found its equilibrium or defined core sectors which can make it grow in a sustainable way. The record on policies to support agglomeration under such circumstances is sketchy.

247. For historical reasons, Russia’s industry has large and excessively concentrated establishments (individual production facilities), but small firms. This induces economic pressure toward consolidation at the firm level. Horizontal integration has increased substantially over the last decade. This integration is often associated with the expansion of financial-industrial groups. Since these groups, built mostly around natural-resource industries, have much larger means at their disposal than other Russian economic players, concerns have been raised about the threat of market dominance and monopolization.

248. The ownership of enterprises and firms by individuals (concentrated ownership) is generally and justifiably reckoned to improve corporate control and hence economic performance at the enterprise level. However, in Russia large individual owners and the financial-industrial groups which they direct have allegedly taken control of large swathes of national industry in the process of privatization. One problem is that no one knows just how much they control. Another problem is that there is no agreement on the implied consequences: opinions range all the way from claiming that this is the best way to restructure Russia’s industry to the fear that cartels are being imposed to stifle the growth of competitors. The next section addresses these questions, based on a new data set which has been collected for the CEM. The main policy points arising from this section are as follows:

- The policy implications of Russia’s job-creation patterns all relate to the need for a better investment climate to generate the best possible conditions for private enterprise restructuring and growth. Emphasis should be placed on supporting the creation and growth of new enterprises rather than on the privatization or restructuring of old ones. Russia can utilize the experiences of other transition economies, namely, that the growth of the new enterprise segment best serves aggregate growth.

- One way to prevent the stifling of competition due to market concentration or control is to ensure that the economy remains open to foreign competition on the product side, but also to foreign investment. Another way is to meet the need to establish well-regulated secondary markets to trade company shares and ownership rights, to ensure access to finance for companies and exit and entry opportunities for minority investors.

- The second pillar of a strategy to uphold competition (without preventing markets from finding the most effective ownership concentration) is to ensure that a universally binding and unbiased antitrust legislation is in place, and that a strong institution is given the task of implementing it, without allowing for arbitrary or discretionary implementation.
C5. OWNERSHIP AND CONTROL

249. There has, so far, been no systematic attempt to measure the degree of ownership concentration in Russia and to understand the extent to which different incidents of ownership concentration are related to each other.\textsuperscript{76} There has been little evidence, one way or the other, to support, or contradict, the arguments that concentration of ownership in the hands of a small number of owners of large financial-industrial groups (FIGs), is beneficial for restructuring and investment, or that such a system will block growth by preventing competition.

250. The debate is further complicated by the need to distinguish between ownership concentration on the firm level (which, economic theory agrees, is likely to improve economic performance) and ownership concentration on the economy-wide or national level. Only the latter may give rise to non-competitive behavior and may be caused by returns to size that have little to do with economic efficiency.

251. There is broad agreement that the debate should focus on two issues. The first is the nature of the link between concentration of ownership rights and economic performance. The second is the link between concentration of ownership rights and ability to extract preferential treatment from government institutions and authorities. Both of these issues are addressed in this chapter, utilizing a new dataset that has been collected for this CEM.

252. Ownership concentration is important at different levels. At the level of the firm, the concentration of ownership and control in the hands of large shareholders can help overcome the basic problem of corporate governance and therefore promote investment and growth (Becht, Bolton, and Roell 2002). At the sector level, concentration of ownership in the hands of a few major players can reduce inefficiencies due to suboptimal firm size or cost duplication. Economic theory suggests that – highly relevant for Russia – there are technological and market reasons why ownership concentration in some sectors should be higher than in others. If there are economies to scale that make production in a few large units more efficient than in many smaller ones, or if there are huge markets with high fixed and/or transaction costs that make competition by large units more effective than by smaller ones, the respective sectors will, everything else equal (in particular equal concentration within the firm), be dominated by fewer units and will therefore show higher ownership concentration. There is nothing wrong with these differentials. The car industry or oil and gas production are cases in point: it makes no sense to assemble cars in somebody’s backyard, and so the market for cars is likely to be dominated by a few large players. Similar arguments apply in the case of export-oriented companies that have to compete on global markets.

253. However, concentration of ownership can also result in collusion, create barriers to entry and in other ways impede upon competition. And, at the national (or regional) level,

\textsuperscript{76} The only two papers that have attempted to measure ownership concentration in Russia are Boone and Rodionov (2002) and Krupnyj Rossiiskij Business 2003. The former paper studied Russian companies listed on the stock market and found that 8 business groups in Russia control 85 percent of the value of 64 listed companies. Boone and Rodionov (2002) suggest that, although Russia’s ownership concentration may indeed be dangerous for economic policymaking, it has delivered sizable benefits in terms of providing companies with incentives to restructure and invest. The latter book studied Russia’s 10 largest business groups trying to recreate empires from scattered information of inter-company links.
concentration of ownership can bring about (as well as being the result of) the domination of economic policymaking by a few special interest groups and in the subversion of institutions, resulting in preferential treatment of a few large owners, thus re-enforcing non-competitive advantages.

254. All of these interactions seem to be present and relevant in Russia’s economy. Given the lack of shareholder rights protection, a high concentration of ownership rights has been called the only mechanism to resolve conflicts of interest within the firm and to provide incentives to restructure and invest. On the other hand, since the initial institutional set-up of Russia’s economic transition was far from enabling the reproduction of a viable long-term market structure in terms of firm size (in particular since efficient secondary markets for trading and re-allocating ownership rights remained largely absent after privatization), many industries are still too fragmented (see chapter C4 of this Report). In the absence of effective antitrust policy and transparent secondary markets for ownership rights, the threat of horizontal collusion, where individuals or groups establish major holdings across different sectors of the economy, is real. And finally, alliances of political leaders with large business have become so widespread, on the federal, but in particular also on the regional level, that a new term has been coined – “state capture” (Hellman, Jones, and Kaufmann 2002), to express the influence peddling from and the preferential treatment awarded to those with insider access. Despite the lack (and impossibility) of quantitative research, the influence of big business on federal and regional policymaking is a widely accepted fact.

255. In an ideal world, concentration of ownership at the firm level should not require concentration of ownership at the national level. Even if each firm in the system were controlled by a single shareholder -- because, as economic theory suggests, concentration at the firm level facilitates the control of complex organizations and therefore enhances their efficiency -- one would still expect competition to ensure that none of the individual owners becomes so much bigger than the others that he could influence national politics – a result which, in turn, would guarantee that competition is maintained.

256. In reality, however, firms may operate in an environment characterized by lack of transparency, weak financial systems, and imperfections of legal institutions. In such an environment, size will “matter” because huge economies of scale are likely to emerge from exploiting the absence of properly functioning financial and legal institutions. Financial-industrial conglomerates are likely to outperform stand-alone firms – not due to any superior organization of production and trade, but because they are better suited to cope with an imperfect economic environment: When a few private agents control a large share of cash flows or employment, it becomes easier for them to lobby, bribe or intimidate government officials to influence the operation of legal, political and regulatory institutions. The imperfect economic environment is the interface that links ownership concentration at the firm level to ownership concentration at the national level (including across sectors), and it does so via the ability of relative firm size to distort competition.

257. This section investigates three issues to try and understand the situation in Russia. First, we measure actual concentration of Russia’s economy using a new dataset specifically compiled for the purposes of this Report; second, we look at how measured concentration influences economic performance; and third, we ask whether the economic consequences of state capture depend on the type of firms, which do the capturing, i.e. on who owns them.

---

78 Boone and Rodionov (2002); Guriev and others (2003)  
80 Russia has also been missing another element necessary to uncouple concentration of ownership on the firm level from that on the national level: a sizeable inflow of foreign direct investment.
258. The results reported below are based on data collected by a survey carried out between June and September of 2003. Because transparency is weak and mechanisms to hide true ownership information via complicated and opaque holding structures on- and off-shore is very well developed, there is little point in questioning registrars and other publicly available information to gather information on the “who owns what” question in Russia. Instead, this survey “asked the market”, i.e. proceeded to gather information from market participants, sector analysts, investment banks, insurance companies, archives, and other repositories of market knowledge as detailed below. It therefore deserves to be noted at the outset, that the survey entails no claim on accurate knowledge of the distribution of ownership rights in any legal sense. Instead, it documents, to the best knowledge of the market, the true distribution of ownership rights in Russia in the summer of 2003.

259. The purpose of the survey was to uncover the true degree of concentration of enterprise control in Russia. Very little factual information is available on this issue and there is a widespread lack of transparency. Among the obstacles faced by researchers are complex chains of vertical and horizontal ownership and control relationships: holding companies, off-shore arrangements, business alliances, etc. The survey aimed to be large-scale and comprehensive, covering a large portion of Russia’s economy. It was designed to unravel chains of ownership and control of firms, identifying ultimate owners—or, to be more precise, controlling parties—and the degree of their control over portions of the economy. The survey aimed to cover listed and non-listed companies alike, to arrive at comprehensive coverage.

260. The survey proceeded in three stages. First, sub-sectors of the economy were selected for inclusion. The primary criterion was size, the idea being that the survey should cover as large a portion of the economy as possible. Sub-sectors were narrowly defined (usually referring to a specific product market) and were drawn from industry, construction, and market services. It is important to note that the selection did not depend on concentration.

261. The second stage was to select the initial set of firms. In fact, the survey often started at the level of “establishments”, the individual physical production units which were introduced in section C4, since the ownership structure, which demarcates firms is often what needed to be brought to light. Again, the selection criterion was size: the largest firms in each sub-sector were targeted for the survey. This was not based on any assumption that big firms are more likely to be owned by individuals with significant assets on a national scale: we cannot know that a priori, any more than we can know whether large sub-sectors are more likely to be controlled by nationally significant owners (e.g. via large firms). The point of choosing large firms was simply to maximize coverage in measuring the degree of concentration in each

---

81 In industry, the sub-sectors that were chosen were the largest 5-digit industrial sub-sectors by sales and employment that can be described as single “markets”. A similar set of criteria was used for such sectors as construction and services. Several sectors and sub-sectors were also chosen because of their strategic importance (e.g., banks and mass media).
82 A range of sources was used to target the largest firms. Size was measured by sales, employment, or (in the case of banks) assets. Since all initial statistical sources are based on company reporting according to Russian accounting standards, they did not capture the consolidated accounts of large financial industrial groups. Adjustments as described in the text (cf. par 261 and 262 and fn 84 in this section) were applied to address this potential source of error.
chosen sub-sector\textsuperscript{83}. Nevertheless, the procedure is tantamount to assuming that nationally significant owners only control large firms. It thus puts a lower limit on the degree of concentration that will be discovered – because it neglects the extent to which “big” business may in fact be in control of small firms.

However, this approach threatened to seriously underestimate control over sales by small trading companies. In particular, transfer pricing (as discussed in detail in chapter C.3 of this Report), during the period under consideration usually carried out with the help of smaller trading companies, plays an important part in measuring the true (i.e. consolidated) cash flows of many natural resource enterprises. To arrive at a more realistic ranking of Russia’s biggest business groups we therefore had to adjust the originally compiled dataset to take account of various profit centers and trading companies that looked too small to be included into our original sample, yet turned out to be crucially important for obtaining accurate aggregated data for several of large business groups.\textsuperscript{84}

In the third stage, fieldwork was initiated, i.e. investigators set out to identify (a) the main controlling owners of each firm and the portion of the firm they owned, and (b) any subsidiaries owned by the firms. This in turn generated new sets of firms to be investigated – owner-firms and subsidiaries. A chain would stop upwards when an “ultimate owner” or “controlling party” was identified, and would stop downwards when a firm owns no subsidiaries. An ultimate controlling party could be an individual, business alliance, or corporate entity. In addition, basic economic and financial data on the ‘firms were collected. The fieldwork took place in June-September 2003.

The investigators employed in data collection were mostly economic and business journalists, who visited investment banks, consultancies, business advisors, information agencies and other institutions that are potential repositories of market knowledge. Based on a questionnaire developed for this purpose, they asked sector analysts, economists, bankers, and other market participants at these institutions, who have detailed sector knowledge, about ownership and control structures of the firms in question. Respondents were assured anonymity. The resulting data was checked and supplemented with publicly accessible information.

The resulting data base thus represents the distribution of ownership and control at a particular point in time – the summer of 2003 – as seen by the market. It is an attempt to collect and structure scattered knowledge available from market participants.

Given the problems of corporate governance in Russia, the survey participants (both interviewers and respondents) suggested differentiating between the degree of ownership and control. Respondents had difficulty identifying the exact degree of formal ownership in some cases, because of the non-transparent nature of Russian ownership arrangements, whereas the degree of control was much more observable.

Moreover, for the purpose of this report, it is concentration of control rather than formal ownership that matters. However, while the questionnaire included questions on the degree of control, respondents were also asked to indicate whether control is based on (dis)-proportional degree of ownership, or other considerations. In most cases, ownership and control was similar (see also box 2). In what follows ownership and control are used interchangeably, except where a distinction is made explicit.

Another problem was the size measure to use, given the available data. In principle, the economy-wide sales data necessary to put our sample in the appropriate context (i.e.

\textsuperscript{83} This procedure increases the comprehensiveness of the coverage (share of total sales covered), since large firms tend to be more productive (cf. table C5.1).

\textsuperscript{84} We are grateful for the important cooperation on performing this adjustment to a team led by Alexei Sokolov.
economy-wide data using the same sector definitions and coverage as our sample sub-sectors) can be identified only for industry, but nor for the newly emerging service sectors. Although sales data was acquired for most of the non-industrial firms in the sample, there is generally no data on the economy-wide level to compare them with. Economy-wide employment, on the other hand, is available in comparable sub-sectors from the Labor Force Survey (LFS) (section C2). LFS data covers total employment well because it also covers small firms. Given these restrictions, we use employment data for the entire sample of companies in different sectors (with the exception of banks) and sales data as an output measure only for companies in sub-sectors of industry. The size of banks is measured by their assets.

269. This data collection effort resulted in a comprehensive picture of the distribution of ownership and control in the Russian economy. The database contains information on more than 2.5 thousand firms, banks, individuals, business groups, and government entities. Forty five sub-sectors were chosen because they play an important role in the Russian economy, and because they can be easily identified with product markets. The sample includes the largest enterprises in these sub-sectors and, on that basis, we have been able to identify a non-trivial degree of control for 1700 firms, which employ 4.3 million people. Total sales of sample companies in industrial sub-sectors are 5.2 trillion rubles (as mentioned above, we do not use sales data for other sectors). According to comprehensive Goskomstat 2001 data for Russian industry (which includes more than 150,000 firms), our sample covers 22 percent of industrial employment and two-thirds of industrial output. The average firm in the sample employs about 2527 workers, and has annual sales of USD 105 million. On average, we account for 88 percent of control if weighted by employment, and 92 percent of control if weighted by sales. Information on ownership and control is usually as of 1 June 2003.85

270. An important feature of the survey is the ability to relate the findings for the sample to the aggregate economy. This is illustrated in table C5.1 below.

### Table C5.1 Sectoral and Sample Coverage

<table>
<thead>
<tr>
<th></th>
<th>Total economy</th>
<th>Covered (sub)sectors</th>
<th>Surveyed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of total</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)/(1)</td>
<td>(2)</td>
</tr>
<tr>
<td><strong>By employment (persons):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total in economy</td>
<td>64,400,051</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>16,467,915</td>
<td>8,262,857</td>
<td>3,551,726</td>
</tr>
<tr>
<td>Construction</td>
<td>3,928,709</td>
<td>2,009,805</td>
<td>118,489</td>
</tr>
<tr>
<td>Trans/Communic/Media</td>
<td>5,899,027</td>
<td>1,360,813</td>
<td>486,014</td>
</tr>
<tr>
<td>Trade</td>
<td>8,628,161</td>
<td>2,307,782</td>
<td>136,272</td>
</tr>
<tr>
<td>All major sectors</td>
<td>34,923,812</td>
<td>13,941,257</td>
<td>4,295,901</td>
</tr>
<tr>
<td><strong>By sales (mln Rub):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>5,881,000</td>
<td>4,499,909</td>
<td>4,522,465</td>
</tr>
<tr>
<td><strong>By assets (mln Rub):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banking</td>
<td>3,399,214</td>
<td>3,399,214</td>
<td>2,321,604</td>
</tr>
</tbody>
</table>

---

85 A pilot was conducted in May 2003. The main set of data was collected between June and September 2003. As of November 2003, the data base consisted of 2596 entries.
271. The first column of the table shows figures for the broad sectors of the economy covered by the survey: industry, construction, transport and communications (including media), trade, and banking, using the three indicators of size discussed above, which are employment, sales (available only for industry), and assets (used only for banking). Column (2) reports the corresponding figures for the sub-sectors covered by the survey, and column (3) displays the extent to which the sub-sectors in the sample reflect their overall sectors: for example, in industry, the 32 sub-sectors chosen for the survey account for half of Russia’s industrial employment, and over three-quarters of industrial sales.

272. Column (4) presents the summary figures for firms included in the survey, and column (5) presents these aggregates of the total database as a percentage of their respective sub-sectors. Similarly, column (6) reports the sample size relative to the economy as a whole. Thus, the sample covers almost 12 percent of the entire Russian economy by employment, varying from the comprehensive 22 percent coverage in industry to 1.6 percent in trade; and it covers more than two-thirds of industry by sales.

273. The sample firms in industry, transport and communications, and banking also account for a large fraction of total economic activity in these sectors. For example, the surveyed industrial firms account for 86 percent of all sales in the sub-sectors chosen for the survey, and 43 percent of industrial employment in these sub-sectors. The banks in the database account for 68 percent of assets in the banking sector. However, the construction and trade firms in the database account for a very low portion of total employment in their sectors. As discussed in detail in sections C3 and C4 of this report, the size of most companies in the construction and trade sectors is very small, and the size distribution of firms very fragmented, so that ownership concentration is unlikely to become an issue in these sectors, at least as long as size is measured by employment.86

(c) Determining the “ultimate owners”

274. To investigate how concentrated ownership is in Russia’s economy, the degree of control up the pyramidal structures has to be tracked for the firms in the sample, to establish a list of ultimate owners. Ultimate owners are classified as belonging to one of the following categories: (i) federal government; (ii) regional government; (iii) foreign; (iv) large private domestic owners; and (v) other private domestic owners. “Large private domestic owners” and “private domestic owners” may include not only individuals, but also groups or alliances, defined using a formal procedure based primarily on multiple incidences of shared ownership.87

275. To generate the list of owners which are significant on a national scale, the largest private owners in the sample were identified on the basis of firm size measured by annual sales and employment. Sales and employment were attributed to owners in proportion to their share of control. On that basis, all private domestic owners or groups of owners, who control either R20 billion (USD 700 million, or 0.4 percent of the total sample) in sales or 20,000 employees (0.5 percent of total employment captured by the sample), were identified as big business. The

---

86 Our investigation of the importance of transfer pricing in Russia’s energy sectors (cf. section C3 of the CEM) showed that there may be problems in estimating the correct size of many trading companies if this is done by employment. We discovered the scale of this problem only in the course of research for this Report and attempted to address the consequences for the assessment of ownership as discussed in par. 161-162 and fn 84 above.

87 Owners A and B are said to be in an alliance if they appear together as ultimate owners for every firm of which they have non-trivial ownership. This formal procedure was supplemented by the creation of additional alliances based on information available from open sources.
result was a list ranking 22 major groups of private domestic owners who broadly conform to
the conventional perception of a big business: the 22 include all large private owners who (i)
have major stakes in firms in multiple regions; (ii) are discussed and visible in the press as
Russia’s most influential and/or wealthy asset holders, or as active lobbyists.
Table C5.2 Large private business-groups, managing total sales of R2 trillion rubles and 1.8 million employees

<table>
<thead>
<tr>
<th>Rank by Employment</th>
<th>Employment</th>
<th>Sales, R 000</th>
<th>Managed by Company</th>
<th>Flagship Company</th>
<th>Rank by Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>168,966</td>
<td>64,825,452</td>
<td>Deripaska</td>
<td>BaseElement</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>168,554</td>
<td>202,629,008</td>
<td>Abramovich/Shvidler</td>
<td>Sibneft/Millhouse</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>167,223</td>
<td>111,593,552</td>
<td>Kadannikov</td>
<td>Avtovaz</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>143,437</td>
<td>70,276,496</td>
<td>Popov, Melnichenko, Pumpiansky</td>
<td>MDM</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>136,868</td>
<td>474,973,216</td>
<td>Alekperov, Maganov, Kukura</td>
<td>Lukoil</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>121,901</td>
<td>78,224,152</td>
<td>Mordashov</td>
<td>Severstal</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>111,692</td>
<td>137,194,080</td>
<td>Potanin, Prohorov</td>
<td>Interros</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>101,091</td>
<td>52,412,024</td>
<td>Abramov</td>
<td>Evraz</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>94,047</td>
<td>121,121,744</td>
<td>Vekselberg, Blavatnik, Balaeskul</td>
<td>Renova/Access Industries</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>93,271</td>
<td>149,226,576</td>
<td>Khodorkovsky, Lebedev</td>
<td>Yukos</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>74,933</td>
<td>33,221,580</td>
<td>Makhmudov, Kazitsin</td>
<td>UGMK</td>
<td>16</td>
</tr>
<tr>
<td>12</td>
<td>65,325</td>
<td>163,129,392</td>
<td>Bogdanov</td>
<td>Surgutneftegaz</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>56,892</td>
<td>57,199,712</td>
<td>Rashnikov</td>
<td>Magnitogorskie Steel</td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td>53,932</td>
<td>30,854,502</td>
<td>Ziuzin</td>
<td>Mechel</td>
<td>17</td>
</tr>
<tr>
<td>15</td>
<td>47,326</td>
<td>38,951,240</td>
<td>Lisin</td>
<td>Novolipetsk Steel</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>41,698</td>
<td>20,439,996</td>
<td>Smushkin, Zingarevich</td>
<td>IlimPulp</td>
<td>19</td>
</tr>
<tr>
<td>17</td>
<td>41,046</td>
<td>40,611,844</td>
<td>Tahaudinov</td>
<td>Tatneft</td>
<td>14</td>
</tr>
<tr>
<td>18</td>
<td>38,490</td>
<td>106,713,016</td>
<td>Fridman, Khan</td>
<td>Alfa</td>
<td>8</td>
</tr>
<tr>
<td>19</td>
<td>35,935</td>
<td>15,113,239</td>
<td>Ivanishvili, Gindin</td>
<td>Metalloinvest</td>
<td>21</td>
</tr>
<tr>
<td>20</td>
<td>35,384</td>
<td>10,265,729</td>
<td>Bendasidze, Kazbekov</td>
<td>OMS</td>
<td>22</td>
</tr>
<tr>
<td>21</td>
<td>20,272</td>
<td>26,946,746</td>
<td>Evtushenkov, Novitsky, Goncharuk</td>
<td>Sistema</td>
<td>18</td>
</tr>
<tr>
<td>22</td>
<td>12,704</td>
<td>20,254,446</td>
<td>Yakobashvilli, Platinin, Dubinin</td>
<td>WimmBillDann</td>
<td>20</td>
</tr>
</tbody>
</table>

Total 1,830,987 2,026,177,742

Note: The table reports owners with at least 0.4 percent of total sales or 0.5 percent of total employment in the sample. The numbers for employment and sales are based on the proportional rule. E.g., employment controlled by group i is: E_i = \sum_j a_{ij} E_j, where a_{ij} is the share of control that group i has over firm j, and E_j is the employment of firm j. Employment or sales controlled by group i outside our sample are not included; the table therefore reports lower bounds on these variables.
Table C5.2 ranks the 22 largest private owners or alliances and their flagship firms. This ranking is based exclusively on the firms covered by the survey, but the number of individuals who fail to be captured on account of their large interests in sectors outside the survey is not likely to be big.  

The category “federal government” includes all employees of federal government and federal government agencies. The assumption made here is that the management of all state owned companies, including but not limited to Gazprom, Rosneft, RAO UES, Transneft, MPS, Aeroflot, and FGUP Sevsmash, is fully controlled by the federal government and that civil servants not affiliated by their function with commercial companies are acting on behalf of the federal government. In addition, the possible influence of private owners on state property (and their managers) has not been measured, and is therefore not taken into account in what follows. Similarly, private owners have not been merged with (regional) governments, with which some have close relations.

Several remarks are in order before presenting the main results. First, although the ownership and control data refer primarily to mid-2003, the data on sales, employment and assets refer to 2001 and 2002, since more recent data for the majority of firms in the database are not yet available. Performance measures therefore had to rely on sales and employment data from these years: In other words, we need to assume that changes in control between 2001, 2002 and 2003 have been minor. Given data availability, this is an inevitable limitation (the most active phase of privatization and consolidation was concluded before these dates). Second, the concentration results for sales use 5-digit sector aggregates from the Russian Registry of Industrial Enterprises, a census of medium-sized and large firms, which misses out sales by small industrial firms (approximately 20 percent of industrial sales on aggregate). The result, ceteris paribus, is a modest overestimate of concentration, but only when using sales data. Employment concentration results are based on data from the Goskomstat Labor Force Survey, which covers all economic activity (including unregistered employment). Omission of ownership stakes by large owners in small firms that may have, by its design, escaped the sample implies a modest underestimation of concentration, independently of whether measured by sales or employment.

(d) The degree of concentration in Russia’s economy

One key feature of the survey methodology is that it allows an estimate of concentration in the economy as a whole. For each of the sub-sectors in the database, it is possible to calculate “sales controlled by”, “employment controlled by”, or “assets controlled by”, for four major categories of owners, namely Russian big business, federal and regional governments, and foreign owners. These sums are then compared to the economy-wide aggregates of employment, sales or assets of the respective sectors (i.e. to what is in the database plus what is not in the database, or row 2 in table C5.1 above). The rest of the sector that is not controlled by one of these four groups is taken as controlled by other private owners, i.e. erring on the side of caution, we assume that the remainder of each sector (economy-wide  

---

88 We have also tried to lower the selected threshold to capture bigger number of private owners that could be counted as the largest ones. Lowering the sales threshold by 40 percent added 6 more owners to the list of largest, and increased the total number of firms in our sample controlled by the largest private owners by 10 percent (at the expense of other private owners). However, upon analysis of the performance of the group of 22 and group of 28 versus other types of owners, we decided that our original threshold was more rational. The group of 22 had much more features in common than the group of 28. In our interpretation, this implied that the group of 22, not 28, is the distinct group of large private owners. Also, regression results are not much affected by the choice of either 22 or 28 groups.
sector minus firms in the data base) is controlled by small, private and non-foreign owners and not by large private owners.

280. Figure C5.1 displays the composition of the sample: 22 business groups control 45 percent of sales and 47 percent of employment in the sample – by both measures, more than the other private owners combined. This raises the question how representative the sample is, i.e. how well its results apply to the economy as a whole. In terms of employment, we would expect that firms in the covered sectors that were not chosen for inclusion in the database, are too small to be part of the largest business groups. As to the (sub)sectors not covered by the database, there is no a priori reason why the sample should not be representative – recall, that sectors for inclusion in the database where not chosen by their expected degree of ownership concentration).

281. Figure C5.2, in contrast, provides an example of a lower bound for the shares of employment and sales controlled by several categories of owners. It displays control by category of owner for the sales and employment shares of firms in the 32 industrial sub-sectors covered by the database. “No data” stands for the share of control that the survey failed to identify in the sampled firms and for firms that were not covered by the survey. To the extent that the largest owners, or any other ownership category, also control sale or employment shares in these non-covered firms, their share would have to be adjusted from what is shown in figure C5.2. The largest 22 owners thus at a minimum control 20 percent of employment and 39 percent of sales.

Figure C5.1 Sample composition by employment and by sales

![Graph showing sample composition by employment and by sales](image)

Note: The figure presents employment and sales shares of the firms in the sample that are controlled by each category of owners. “No data” stands for the share of ownership/control that our survey has failed to identify in the sampled firms. The 22 largest owners control 45 percent of sales and 47 percent of employment in the sample.
Figure C5.2 Surveyed firms as a share of all firms in industry (32 sub-sectors) by employment and by sales

Note: The figure presents employment and sales shares of the firms in the sample that are controlled by each category of owners, as a fraction of aggregate employment and sales in 32 sectors in industry that are covered by the sample. "No data" stands for the share of ownership/control that our survey has failed to identify in the sampled firms and for firms not included in the sample. The largest 22 owners control 20.2 percent of employment and 38.8 percent of sales; 43 percent of employment and 86 percent of sales in the 32 industrial sub-sectors are covered by the sample (table C5.1).

282. Table C5.3 below presents the concentration of ownership in Russia by broad sectors of the economy. Control by financial-industrial groups is highest by far in industry and is also high in banking. In the 32 industrial sub-sectors, FIGs control 38.8 percent of sales, whereas combined federal and regional governments control 24.5 percent (most of which is federal), and the foreign share is 5 percent. Remaining owners account for the balance of 31.5 percent.

283. Concentration of control is lower in terms of employment: the large owners and their groups control 20 percent of employment in the industrial sectors covered by our sample. The shares of employment controlled by the federal, but not so much the regional, category of government and by foreign owners are also smaller than their shares measured by sales, and this appears to reflect the fact that FIGs as well as the federal government and foreigners engaged in industrial production, tend to focus on large, capital-intensive and profitable firms (and sectors), where labor productivity is above average.

284. In the construction and services sectors, concentration of ownership in the hands of FIGs is relatively small: two percent of employment is registered in transport and communications, and less than that in the rest. For construction and retail trade, the explanation is fairly obvious – economy-wide, these sectors have a large proportion of activity conducted by small firms, which are not in government or FIG control.

285. Unsurprisingly, the exception in the market service sector is banking: financial-industrial groups control about 17 percent of banking assets. Federal and local governments combined still have control over a quarter of total assets in the banking sector, largely explained by a continued large ownership stake in Sberbank by the Central Bank (CBR), and government control of Vneshekonombank and Vneshtorgbank. The fact that federal ownership overall is only 17 percent reflects the large private minority stakes in these banks (this information is publicly available). Foreigners control about 10 percent of total banking assets, and the remainder – almost half of the banking sector – is controlled by small domestic owners.
Table C5.3 Control of Broad Sectors by Share of Sales, Employment and Assets, %

<table>
<thead>
<tr>
<th>Sector</th>
<th>Big business share</th>
<th>Government share</th>
<th>Foreign share</th>
<th>Other private owners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All of which:</td>
<td>of which:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Federal</td>
<td>Regional</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Based on Sales:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry (32 sub-sectors)</td>
<td>38.8 24.5 19.6</td>
<td>4.8 5.3 31.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Based on Employment:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry (32 sub-sectors)</td>
<td>20.2 7.0 4.4</td>
<td>2.6 1.2 71.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction (1 sub-sector)</td>
<td>1.3 1.5 0.6</td>
<td>0.9 0.1 97.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans. &amp; Comm. (6 sub-sectors)</td>
<td>2.4 20.0 19.0</td>
<td>0.9 0.2 77.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade (5 sub-sector)</td>
<td>0.2 0.0 0.0</td>
<td>0.0 0.5 99.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Based on Assets:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Banking</td>
<td>17.4 25.6 19.8</td>
<td>5.7 10.8 46.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

286. Moving to the level of individual sectors reveals still more variation, as can be seen in the diagrams below. The overall picture is very clearly one where certain (large) sectors have concentrated ownership structures, while others are comparatively fragmented. Government ownership is also significantly skewed toward a few key sectors; and foreign ownership is far from being evenly distributed across sectors as well, being focused in a few sectors with identifiable common features. Sector specificity of ownership categories thus is high.

287. Figures C5.3(a) and (b) show the degree of ownership concentration in industry if firm size is measured by sales. Sectors are displayed (a) in descending order by the fraction controlled by big business, and then (b) in descending order of control by other owners. Control by FIGs and affiliated individuals is highest in a number of “strategic” sectors: oil and raw materials, automobiles, and chemicals. Registered big business and FIG presence in the remaining sectors is relatively small.

288. Federal government dominance is located in a smaller number of sectors of similar importance: gas and energy, reflecting control over Gazprom and RAO-UES, jewellery (primarily the diamond company ALROSA), and the state pipeline system, Transneft. Interestingly, regional government control, in sectors where it is sizeable at all on this nationwide scale, appears to accompany a strong federal presence. This is the case in the jewellery, rubber and tire sectors, where privatization was slow.
289. Foreign ownership also tends to be sector-specific and is most pronounced in sectors producing final consumption goods, such as tobacco, beer, confectionary, or non-alcoholic beverages. Product differentiation is important in these sectors and international brand names signal quality, giving foreign companies a competitive advantage. The remaining sectors – indeed, most sectors – are not very concentrated, and are dominated by smaller domestic private owners. The pattern is that, where control by big business representatives is high, control by smaller private owners is low, and vice-versa. No such clear pattern is observable for other categories of owners.

290. We pointed out above that the share of FIG control of total output across sectors (sales volume) is higher than their control of employment shares across sectors. Figures C5.3 and C5.4 offer a first indication of the extent to which this reflects control over particularly productive sectors, as opposed to control over more productive companies within sectors. The top-ten FIG controlled sectors are almost the same by employment shares and sales shares, although their ranking varies slightly. It is noticeable that the share of sales under control of FIGs is generally speaking larger than their share of employment in almost all sectors, where their presence is registered.
Figures C5.3(a) and (b) Ownership Concentration by Employment

Concentration of Employment ranked by Largest Private Owners share in 32 sub-sectors

Concentration of Employment ranked by Other Owners share in 32 sub-sectors
Figures C5.4(a) and (b) Ownership Concentration by Sales

Concentration of Sales
ranked by Largest Private Owners
share in 32 sub-sectors

Concentration of Sales
ranked by Other Owners
share in 32 sub-sectors
The largest owners tend to be active in sub-sectors that are large in aggregate: oil, raw materials, and autos. In general, sub-sectors that are upstream are more likely to be FIG (or federal government) controlled than those that are downstream, with a few exceptions such as the timber or mining industries. Conversely, private domestic owners without national significance are most active in smaller sectors, with machinery being the major exception. Regression analysis confirms this result, and figures C5.5(a) and (b) below display these relationships, plotting control over a sector vs. the size of the sector, with the latter defined as the log of total sales share of that sector in the economy as a whole.

**Figure C5.5(a) Largest Owners' Share of Sales**
292. Financial-industrial groups are controlling the largest firms: Measured by sales, the average firm identified as controlled by one of the big business groups or individuals is 50 percent larger than the average firm controlled by other private domestic owners in the database, which is solely explained by concentration of big business groups in sectors where average firm size is large. 89

293. One way of deriving overall concentration of ownership in Russia's industries, once the ultimate owners of the firms in the sample have been established, is to calculate concentration indices to take into account that production units in different industries may be owned by the same ultimate owner. Guriev and Rachinsky (2004) in a background paper for this Report, calculate these concentration ratios for 32 industries. After ownership of multiple firms in different sectors by the same owners is taken into account, market concentration in Russia's industries increases (see table 6 there). Not surprisingly, except for government-dominated natural gas and jewelry, and foreign-dominated non-alcoholic beverages, the list of the most concentrated industries is identical to those controlled by the largest 22 private owners in figures C5.3 and C5.4 above.

294. Shifting emphasis slightly, studying ownership and control of production units across sectors is important not only for the establishment of concentration ratios, but ultimately because it will address the question of cartels and the emergence of trusts. These issues touch upon both the economic need for horizontal integration discussed in section C4 and the suspicion that, in Russia, a small group of holdings is emerging that has started to branch out from its core sectors and to compete economy wide, adding sectors and sub-sectors increasingly far from core businesses. Some view this as a welcome precondition for faster economy-wide restructuring, but others believe that financial-industrial groups are establishing a stranglehold over certain sectors or regions.

---

89 Guriev and Rachinsky (2004)
295. Putting value judgments on one side, our sample makes it possible to calculate the share of each sector in Russia's big business empires. It turns out that, indeed, most of them (15 out of the 22) do control assets in more than three industries.

296. Another useful way of looking at concentration in industry is to compile a "size distribution" of the largest owners, to see how important differences in the degree of control are across owners. Figure C5.6 displays cumulative shares of sales and employment in the 32 industrial sectors as a function of the number of owners. The figure displays all owners, i.e. it includes the 22 largest private owners, the federal government and a few regional governments and foreign owners. The federal government is the largest individual owner in terms of both sales and employment.

297. The degree of economy-wide concentration displayed in this way is large. In terms of sales, the largest five owners control 35 percent and the largest 10 control 46 percent. In terms of employment, the largest five owners control 18 percent and the largest 10 control 25 percent. The largest 20 owners control 59 percent of sales and 33 percent of employment, respectively.  

Figure C5.6 "Size Distribution" of Owners in Industry (32 Sectors)

298. To summarize, although Russia's economy is highly concentrated, with the largest private owners controlling (on a conservative estimate) about 39 percent of sales in industry, this concentration is fairly specific. It is found in large sectors with high levels of labor productivity, notably oil and raw materials and automotive. FIGs tend to control the largest firms in the sample, because it controls sectors, which consist of large firms. FIGs typically control assets across sub-sectors.

299. The next question is, what are the implications for economic performance?

(e) Control and enterprise performance

300. The next step is to test whether different types of owners (and big businessmen in particular) are more or less successful in restructuring their companies, and raising productivity.

---

90 After the federal government, the four largest owners by sales are Alekperov/Maganov/Kukura, Abramovich/Shvidler, Bogdanov and Khodorkovsky/Lebedev; the four largest owners by employment are Deripaska, Abramovich/Shvidler, Kadannikov and the MDM group (Popov, Melnichenko, Pumiansky).
Boone and Rodionov (2002) argued that concentration of ownership in the hands of big business has a positive effect on performance (even if achieved through questionable privatization auctions or outright dilution of state and outside investors). Once ownership is concentrated, large owners and their business groups obtain full incentives to restructure and invest. The anecdotal evidence from Russia’s listed firms seems to be consistent with this conjecture (e.g. the Yukos vs. Lukoil case study in Boone and Rodionov (2002)). Does this logic extend to Russia’s industry in general, i.e. outside the (60) actively traded firms?

301. If one takes Boone and Rodionov’s argument at face value, then it does not have to imply that the largest owners should outperform other private owners. Indeed, what matters is concentration of ownership and control within the company, rather than a very high share of national wealth accumulated in a few hands. Moreover, modern financial economics tends to consider large conglomerates as inefficient (e.g. Scharfstein and Stein 2000). The “conglomerate discount” (negative synergy, equal to the difference between the value of the conglomerate and the sum of its units’ potential values) has been well documented in the US.

302. Certainly, Russia is very different from the US in this respect, and the less developed the market, the more advantages attach to being big, since bigger firms can cope better with risks and financial imperfections. What is even more important in the Russian context is that bigger firms will also be more effective in lobbying. Nevertheless, smaller owners may benefit from their ability to efficiently follow incentives, helped by their small, non-bureaucratic, and decentralized structure. Note that “smaller owners” does not mean small shareholders in large companies. Rather, in Russia (and consistent with Boone-Rodionov’s argument), these are mostly large shareholders in small companies.

303. It is important to note that ownership is consolidated in the vast majority of firms in Russia. The average majority block in the companies in our sample, which are controlled by small domestic owners, is 74 percent and this is not much lower than average majorities in companies controlled by the largest owners (79.5 percent). Therefore, one could expect small owners to be as efficient in restructuring as large owners, and hence differences in the speed of restructuring not to be due to concentration of ownership rights within a company, safe for the fact that large owners may find it easier to raise funds for investment.

304. Evaluating performance of Russian companies is a difficult task at the best of times, given the small size of the stock market (where the few listed companies have very limited free float), imperfect statistics on fixed capital, distorted data due to tax optimization, etc. The only option is to look at output, output per worker and gross profits. Using five categories of owners within our sample we test to what extent changes in output, change in output per worker, and profit margin are different for different types of owners. The benchmark, or base category for the technical analysis, are the small and medium-sized private domestic owners that account for roughly half of our sample. In what follows we investigate the extent to which firms, in which majority control belongs to (i) Russian big business, (ii) federal government, (iii) regional government, and (iv) foreigners, outperform the base category.

(f) Enterprise performance

305. Since these firms operate in different industries, one needs to adjust for industry-specific characteristics (e.g. change in relative prices and terms of trade, industry-specific inflation, technological and other shocks). In order to do so, the performance indicators have been adjusted for their median values within the respective 5-digit OKONKH industries.

306. In this context, it is potentially important to take size into account, even within industry: in many industries, larger firms are more productive. In order to minimize endogeneity
(log) employment in 1999 serves as a proxy for size. It turns out that size does affect some of the performance indicators positively and significantly.

Tables F.1 and F.2 in the annex report the regression results for the years 2001 and 2002. With respect to the relationships between enterprise performance and ownership concentration in these years, the most important findings are as follows. First, comparing the level of labor productivity in each year reveals no evidence that firms controlled by the largest owners systematically outperformed the rest of the economy in either 2001 or 2002 in any way. In fact, in 2001 and 2002 firms controlled by large owners performed worse than those controlled by smaller private domestic owners. However, in a number of alternative specifications the difference would not be significant. We therefore prefer cautious judgment. Second, nothing in the data supports the conclusion that state-owned firms, whether owned by federal or regional government, perform better than the group of private owners. Third, foreign owned private firms outperform domestic private firms. Forth, total factor productivity grew fastest between 2001 and 2002 in firms controlled by foreigners and in firms controlled by the group of largest private owners, which both outperformed on this count other private owners. Fourth, however, in spite of the faster productivity growth there was still a statistically significant difference in productivity levels between the different private Russian owners in 2002. The largest owners still performed worse. Then the main pending question is whether large owners have continued to outperform other owners in terms of productivity growth after 2002, which will eventually bring their productivity to levels above those of other private owners. This will require further study using data of subsequent years, which is not yet available.
Box 2. Ownership and Control

The concentration of control (here distinct from formal ownership) within firms in our sample is very high. Table below shows the average stake controlled by the main owner for different types of owners. Russian big business and foreign owners have slightly higher degrees of control than the others, but while this difference is statistically significant, it is not economically important. On average, FIGs control 79.8 percent in their firms, while federal government controls 72 percent of its firms.

<table>
<thead>
<tr>
<th>Largest owner</th>
<th>Average control stake, %</th>
<th>Number of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russian big business</td>
<td>79.8</td>
<td>906</td>
</tr>
<tr>
<td>Foreign</td>
<td>77.8</td>
<td>152</td>
</tr>
<tr>
<td>Other</td>
<td>74.6</td>
<td>546</td>
</tr>
<tr>
<td>Regional</td>
<td>70.7</td>
<td>165</td>
</tr>
<tr>
<td>Federal</td>
<td>72.0</td>
<td>176</td>
</tr>
</tbody>
</table>

Note: The difference between FIG and foreign owners, on the one hand, and all other owners on the other, is significant at 1 percent.

Germany is alone among developed and transition countries in having a degree of concentration comparable to that observed in Russia (Barca and Bech 2001). The German level of concentration is the highest among all OECD countries. Certainly, it is hard to compare distribution of control and distribution of ownership (in this box concentration of ownership is understood as concentration of voting shares). In countries where corporate governance is far from perfect, majority shareholders usually enjoy a degree of control much higher than their share of votes.

It is interesting that firm ownership constructed on the basis of a sample by the Institute for Economy in Transition (Guriev and others 2003) suggests much lower concentration than the CEM data, and is actually comparable to the distributions in medium-concentration countries such as Spain and Sweden (Barca and Bech 2001), or, among transition countries, Hungary (Berglof and Pajuste 2003).

A reasonable explanation is that control is more concentrated than ownership. In other words, the largest shareholder exercises a disproportionately high degree of control. In order to check this, the CEM data on control and the Guriev and others (2003) data on ownership are compared for the firms that are included in both samples. There are 65 such firms. Figure below presents the joint distribution of ownership and control. On average, the largest owners have a degree of control 36 percent higher than their ownership stake. Control is lower than the largest ownership stake in only 8 out of the 65 firms. In many cases, the largest shareholders control the firms without even holding a minimum block of 5 percent, leading to the suspicion of multiple and/or unregistered shareholdings.

Control and share of voting equity, CEM and IET data

Note: The graph presents the scatter plot of the degree of control in the CEM data and share of ownership (Guriev and others...
(g) State capture in Russia’s regions

308. Industrial ownership concentration is bound to have an important impact on the relationship between governments and firms. This leads back to two questions that surfaced earlier. The first concerned the nature of the link between concentrated ownership on the firm level and concentrated ownership positions in the national economy. The second question is about the nature of the link between state capture, i.e. instances where state institutions and their actions have been subordinated to commercial interests, and aggregate economic performance. As in previous sections (see. C2), the analysis thus shifts from the federal to the regional level in order to make better use of the available data and to trace developments across Russia more closely.

309. As was already mentioned, the term “state capture” has been coined to describe interaction between large private owners and government officials in Russia. In general, state capture refers to a situation where private interests successfully effected a change in rules set by the state.

310. The incidence of state capture across Russia’s regions has been documented, using a data base on regional legislation enacted between 1992 and 2002, and the preferential treatment which this legislation offers to individual firms in each of Russia’s 89 regions. “Preferential treatment” is identified as tax breaks, investment credits, subsidies, subsidized loans or loans with a regional budget guarantee, official delays in tax payments, subsidized licensing, unpaid access to state property, and the creation of a special open economic zone on the site of a specific enterprise (Slinko, Yakovlev, and Zhuravskaya 2003).

312. Capturing the state generates short- and long-term advantages to captor firms on the microeconomic level, in the form of faster sales growth, market share, employment, and investment. Captor firms also maintain higher arrears to suppliers and employees and were protected against legal enforcement of these payments.

313. The effect of capture on aggregate growth is more complicated and depends on the adverse effects which state capture is likely to have on those firms that are not captors. This is a mechanism worth detailing. The institutional advantages enjoyed by captor firms may result in short-term growth of aggregate gross regional product. But this growth will not be sustained, according to previous studies, because of the adverse effects, which capture has on the rest of the economy, including on those firms that do not engage in it.92

---


92 Capture-induced, short-term gross regional product growth does not provide higher budget revenues either, because tax collection falls and arrears increase. The subversion of fiscal expenditures means that in high-capture regions spending on housing, education, and health care is slashed, implying another drag on long-term growth.
314. What has never been studied, however, is whether the identity of the controlling owner affects either the propensity to capture government institutions, or the effect, which the capture has on the rest of the economy, including non-captor firms. Matching the CEM dataset on who controls Russia with the existing data on preferential treatment across Russia’s regions, allows a close-up study of this problem.

315. For this purpose, controlling owners are classified into the following categories: (i) firms that are controlled by federal large owners (defined as private owners that have control over large firms in more than two regions); (ii) private regional owners (defined as private owners that control firms in two or fewer regions); (iii) the federal government; (iv) regional governments; (v) foreign investors; and (vi) firms with dispersed ownership and no one holding a controlling stake.

316. This classification raises an issue discussed earlier, namely the nature of state-owned firms and the civil servants that manage them. There is some evidence (Frye 2003) that state-owned firms in Russia engage in state capture just as much as private firms. This would imply that the state does not have close control over its firms, with managers appropriating control and cash flows for private benefit. If correct, one would expect not to observe substantial differences between the behavior of state-owned and privately owned firms vis-à-vis government institutions, since both types of firms are essentially controlled by private parties. This issue has been avoided above by merging federal civil servants seamlessly into the category “federal ownership”.

317. Federal and regional interests may still diverge. Because there has been no previous research on how state capture and its consequences are affected by the scope of interests of controlling owners, we can’t know the precise pattern a priori. However, in a large country like Russia, firms controlled by agents with regionally focused interests can be expected to behave differently from firms controlled by agents with predominantly federal interests. We therefore maintain the separation between federal and regional owners in this section.

318. On a basic level, the expectation would be that capture of regional government institutions by firms focused on regional interests could lead to policies, which have negative impact on neighboring regions. For example, lowering tax rates or erecting inter-regional trade barriers in one region may serve the interests of large regional owners, but may impose costs on firms in other regions. Hence, capture of regional government by firms with federal interests would be more likely to have negative effects on performance of other firms in the same region.

319. The following analysis is based on the intersection of the two datasets – the CEM dataset and the dataset on preferential treatment of large firms by regional legislation. The sample consists of 301 enterprises in 67 regions of the Russian Federation. Not all firms in the sample have all the data necessary for the analysis. Therefore, regressions usually rely on fewer firms. The distribution of firms across regions and industry is presented in the annex (Tables F2 and F3), and the dynamics of the average number of preferential treatments per firm is presented in figure 1 of the annex.

320. One caveat is in order. The panel data for preferential treatments covers the period from 1996 to 2000, but the cross-section ownership data is from 2003. In the analysis below, cross-section (between-effects) regressions are run on averages over these five years, which assumes that omitting ownership changes since 1996 does not significantly alter the results of the analysis. Mass privatization as well as loans for shares were concluded by 1996, but

prospects. In addition, previous studies found evidence that in high-capture environments the regional authorities create obstacles to small business growth. (http://www.cefir.ru)

94 Slinko, Yakovlev, and Zhuravskaya (2003)
nevertheless this assumption is probably not always accurate. The results therefore need to be interpreted with caution.

(h) Who receives preferential treatment?

321. The first question that needs to be addressed is whether and to what an extent different owners affect a firm’s ability to get preferential treatment. Since preferential treatment is defined as one of the following benefits granted to a particular firm by regional legislation: tax breaks, investment credits, subsidies, subsidized loans and loans with a regional budget guarantee, official permission for late tax payments, subsidized licensing, unpaid appropriation of state property, or the creation of a “special economic zone” on the site occupied by the firm.95

322. To depict the hierarchical nature of the structure of ownership and control, and relationships within FIGs, one needs to distinguish owners that are controlled by others from those that are not. An owner is defined as having full control (to be a “controlling owner”) if his controlling stake in a firm as defined in our data base is 50 percent or higher96. An ultimate owner is a controlling owner that is not fully controlled by any other firm or individual.

323. It is known that a term “financial-industrial group” often has a connotation of consolidated ownership across firms. One relevant question in investigating the effects of capture by different types of owners than becomes whether the size of the group, to which a firm belongs, influences the frequency of preferential treatment granted to this firm. The size of any one group here refers to the number of enterprises that comprise the group, i.e. the number of firms controlled by one ultimate owner.

324. Table C5.4 reports the plain unconditional averages of the number of preferential treatments given to firms and their average share as a function of the size of the group to which the firm belongs.97 The share (as well as the number) of preferential treatments increases with group size.

<table>
<thead>
<tr>
<th>Number of firms per group</th>
<th>Number of firms</th>
<th>Average no. of preferential treatments per firm</th>
<th>Average share of preferential treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 firms</td>
<td>104</td>
<td>0.18*</td>
<td>0.12</td>
</tr>
<tr>
<td>6-24 firms</td>
<td>91</td>
<td>0.27</td>
<td>0.13</td>
</tr>
<tr>
<td>25 firms and more</td>
<td>96</td>
<td>0.26</td>
<td>0.15*</td>
</tr>
<tr>
<td>Whole sample</td>
<td>301</td>
<td>0.24</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Note: * denotes significant difference from other two groups

95 Special economic zones are typically used as vehicles to grant relief from tax, license or royalty payments.
96 Some enterprises in the sample have ownership structure consisting of two equal parts (50:50); in that case, the controlling owner was determined at random. The deletion of such enterprises from the sample has no effect on the outcome.
97 The share is a concentration measure, indicating how the total number of preferential treatments is allocated across firms. It is reported in addition to the number of preferential treatments because if institutional subversion is measured, unequal treatment of similar firms by the legislation is presumed. An extensive discussion of this point is given in Slinko, Yakovlev, and Zhuravskaya (2003). The regression analysis leading to the results reported in tables C5.5 through 5.8 is contained in Yakovlev and Zhuravskaya (2003), a background study for this report.
The second question is whether a firm exercising full control over other firms has a better chance of obtaining political influence (i.e. whether ranking within a firm’s group matters). Table 5.5 presents unconditional means of the shares of preferential treatments for firms that are either the ultimate owner, i.e. on top of the control pyramid, or that are a controlling owner, i.e. in the middle of the pyramid, in comparison to the share of preferential treatment for other firms. Firms that control other firms have higher shares of preferential treatment.

Table C5.5 Does control over other firms matter? (unconditional means)

<table>
<thead>
<tr>
<th>Firm's degree of control</th>
<th>Number of firms</th>
<th>Average share of preferential treatments</th>
<th>Standard errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate owner of a group</td>
<td>6</td>
<td>0.16</td>
<td>0.04</td>
</tr>
<tr>
<td>Other firms</td>
<td>285</td>
<td>0.13</td>
<td>0.01</td>
</tr>
<tr>
<td>Controlling owner of a firm</td>
<td>44</td>
<td>0.17*</td>
<td>0.01</td>
</tr>
<tr>
<td>Other firms</td>
<td>248</td>
<td>0.13</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Note: * denotes significant difference at 5% level

Armed with this information, the question can be addressed how the identity of the ultimate owner affects the incidence of preferential treatment granted to firms through the regional legislature. For this purpose, the following “types” of ultimate owners are defined:

- A firm is controlled by a **private federal owner**, if its ultimate owner is a private firm or individual that has full control over enterprises in more than two regions.
- A firm is controlled by a **private regional owner**, if the ultimate owner is a private firm or individual that has full control over firm(s) in no more than two regions (including full control over just one regional enterprise).
- A firm is controlled by a **foreign investor**, if its ultimate owner is a foreign investor.
- A firm is controlled by the **federal government**, if ultimate control is in the hands of federal ministries, other government agencies, or firms owned by the Russian Federation.
- A firm is controlled by **regional government**, if the firm’s ultimate controlling owner is regional government;
- A firm has **dispersed ownership**, if there is no party that has full control over the firm.

Table C5.6 presents unconditional means for the shares and numbers of preferential treatments sorted by the ultimate owner of the firms that receive them. The average firm size by employment and, for groups with a joint ultimate owner, the number of firms in each group, are provided because they have been shown to have an independent direct effect on the likelihood of getting preferential treatments. It would therefore be misleading to study only the average incidence for each group of owners. A striking result of table 5.6 is that the group of private federal owners receives less preferential treatment by number, as well as by share, than any other group of owners, except for single companies with dispersed ownership.98

98 The regression results are reported in Table F4 in the Annex.
Table C5.6 Does ultimate ownership matter? (unconditional means)

<table>
<thead>
<tr>
<th>Owner type</th>
<th>Number of firms</th>
<th>Average number of preferential treatments</th>
<th>Average share of preferential treatments</th>
<th>Average employment per firm</th>
<th>Average number of firms in group*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional government</td>
<td>9</td>
<td>0.38</td>
<td>0.16</td>
<td>14278</td>
<td>30</td>
</tr>
<tr>
<td>Foreign investor</td>
<td>22</td>
<td>0.34</td>
<td>0.16</td>
<td>2372</td>
<td>12</td>
</tr>
<tr>
<td>Federal government</td>
<td>63</td>
<td>0.32</td>
<td>0.15</td>
<td>6154</td>
<td>44</td>
</tr>
<tr>
<td>Federal private owner</td>
<td>129</td>
<td>0.19</td>
<td>0.12</td>
<td>57620</td>
<td>20</td>
</tr>
<tr>
<td>Regional private owner</td>
<td>67</td>
<td>0.22</td>
<td>0.13</td>
<td>5177</td>
<td>3</td>
</tr>
<tr>
<td>Dispersed ownership</td>
<td>11</td>
<td>0.08</td>
<td>0.12</td>
<td>4198</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: *The average number of firms in groups is calculated from the full sample of firms with ownership data in the CEM dataset. The remaining statistics refer to the sub-sample of firms that is analyzed (for which ownership data and data on preferential treatments is available).

328. Finally, the group of private federal owners can be further subdivided to check for the role and durability of political influence. A number of private federal owners demonstrated high political influence in the mid-1990s when they managed to get access to firm assets by striking loans-for-shares privatization deals with the federal government, in what has been widely perceived as rigged auctions. It is possible to check whether these large owners retained their political influence later on. Table C5.7 presents the unconditional means for the share of preferential treatments received by firms in groups that took part in the loans-for-shares deals. And indeed, these firms display a significantly higher share of preferential treatment than other firms, including the other federal owners.99

Table C5.7 Does the design of privatization matter? (unconditional means)

<table>
<thead>
<tr>
<th>Firms in groups that engaged in loans for shares</th>
<th>Number of firms</th>
<th>Average share of preferential treatments</th>
<th>Standard errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>0.17*</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>236</td>
<td>0.13</td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>

Note: * denotes significant difference at 5% level

329. One can now investigate formally what types of firms receive preferential treatment.100 Ceteris paribus, capacity of a firm to engage in state capture on the regional level, as measured by the share of regional legislation biased towards that firm, depends on the nature of a firm’s owner(s) in the following ways:

(1) The size of the group that is controlled by an ultimate owner has a significant positive effect on the likelihood that firms from this group get preferential treatment.

99 The regression results are reported in Table F5 in the Annex.
100 The regression results are reported in Table F6 in the Annex. For a detailed discussion see Yakovlev and Zhuravskaya (2003).
If a firm is the ultimate owner of a group, or even if it just controls other firms, it is significantly more likely to get preferential treatment than firms that do not have control over other firms.

Of all the ownership categories, firms ultimately controlled by a regional private owner or a foreign direct investor are significantly more likely to get preferential treatments than all other firms.

Firms controlled by large federal private owners and firms with dispersed private ownership are least likely to receive regional preferential treatment.

If a firm is a part of group that participated in loans-for-shares transactions, it is more likely to be granted preferential treatment.

Firms with dispersed owners, with no single owner having a controlling stake, are significantly less likely to receive preferential treatments than all other firms, except firms controlled by federal owners.

The economic significance of these findings is as follows: the ultimate owner of a group and firms controlled by foreign investors receive on average twice as many preferential treatments as the average firm in the sample; firms with regional private owners are 1.3 times more likely to be granted preferential treatment than the average firm; and firms in groups that engaged in loans-for-shares privatizations are 1.2 times more likely to get preferential treatment; whereas firms controlled by private federal owners receive 30 percent less preferential treatments than the average firm in the sample.

(ii) Do the ownership interests of captors impact non-captor firms?

In order to develop a discussion of the relation between different ownership categories and economic growth, one needs to clarify not only whether different ownership categories will affect the likelihood that firms will get preferential treatment, but also whether the extent of damage to the economic environment, caused by successful attempts at institutional subversion, is dependent on the ownership of the subverting firms.

The first step is to identify the distribution of capture by the different types of owners across Russia's regions. In what follows, a region is considered captured by a particular type of owner in a particular year if at least 50 percent of all preferential treatments in that year go to firms that are controlled by that type of owner. A region is considered to be captured by a certain owner category during the 1996-2000 period, if it was captured by this type of owner for at least two out of the five years. Three regions were captured by two different types of owner for at least two years during that period: Tatarstan republic, Vologda oblast and Orenburg oblast. These regions are considered to be captured by both types of owners. Table C5.8 presents the list of captured regions over 1996-2000 by the type of captor.
Table C5.8 Captured regions (1996-2000)

<table>
<thead>
<tr>
<th>Category</th>
<th>Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal government:</td>
<td>Sakha republic; Belgorod oblast; Vologda oblast (1998, 1999); Kurgan oblast; Nizhny Novgorod oblast; Omsk oblast</td>
</tr>
<tr>
<td>Regional government:</td>
<td>Bashkortostan republic; Tatarstan republic (1997, 1999, 2000); Moscow city</td>
</tr>
<tr>
<td>Regional private owner:</td>
<td>Mordovia republic; Tatarstan republic (1996, 1998, 2000); Kaliningrad oblast; Moscow oblast; Perm oblast; Rostov oblast; Tula oblast; Tyumen oblast; Chelyabinsk oblast</td>
</tr>
<tr>
<td>Federal private owner:</td>
<td>Karelia republic; Krasnoyarsk krai; Primorski krai; Vologda oblast (1996, 1998, 2000); Lipetsk oblast; Orenburg oblast (1998, 1999); Sverdlovsk oblast</td>
</tr>
<tr>
<td>Foreign investor:</td>
<td>Udmurtia Republic; Orenburg oblast (1996, 1997, 1999); Saratov oblast</td>
</tr>
</tbody>
</table>

333. The second step is to analyze econometrically the effects of regional capture by firms with different categories of owners on non-captor firms\(^1\). The results show that institutional subversion by federal owners has a significant and strongly negative effect on all performance indicators of non-captor firms in the regions (all performance indicators are net-of-industry-trend). It significantly reduces growth of non-captor firms in terms of productivity, profitability, sales, employment, and regional market shares.

334. In terms of economic significance, the results indicate that a 10 percent increase in the concentration of preferential treatments in regions captured by federal large owners leads to a 3.5 percent decrease in productivity of non-captor firms, a decline of 6.7 percent in their profitability, a 6.8 percent sales decline, 3.8 percent employment decline, and fall of their regional market share by 0.8 percentage points.

335. The results are very similar in case of capture by members of groups that were engaged in loans-for-shares privatizations. A 10 percent increase in the concentration of preferential treatments in regions captured by loans-for-shares group members leads to a 3.2 percent decrease in productivity, a 8.8 percent decrease in profitability, a 8.3 percent decrease in sales, and lowers the regional market share of non captor firms by 0.4 percentage points. Concentration of preferential treatment in favor of foreign firms has consistently negative effects on other firms in a region, but these effects are only significant for profitability.

336. In stark contrast to capture by federal owners, institutional subversion by firms with private regional owners does not have a significant or systematic negative effect on other regional firms (all coefficients are insignificant and five out of seven are positive). If preferential treatment is accorded to firms that are controlled by regional governments, preferential treatment concentration also does not have a statistically significant effect on regional firms, and all coefficients are consistently positive. The effects of capture by firms controlled by the federal government is insignificant, and there is no consistent pattern in the coefficients.

337. Even given the limited number of statistically significant results, the overall picture is quite striking. The strong negative effect of capture when the captors are private federal owners, or groups previously engaged in loans for shares, or foreign investors makes perfect

---

\(^1\) For the regression results see table 5 in the Annex and Yakovlev and Zhuravskaya (2003)
sense because (unlike the regional government) they do not internalize externalities from capture on other firms in the region. In other words, for these groups, which are not regionally based, negative consequences on other firms within the same region due to capturing of the regional authorities do not matter: their interests focus on activities on the federal level, outside the region. Private regional owners, in contrast, turn out to be more benign than federal owners or foreign investors: capture by regional private owners does not have a significant negative effect on other regional firms. This is consistent with the observation that regional private firms typically have limited bargaining power vis-à-vis the regional authorities, and that the regional authorities take into account and try to minimize the adverse effects of capture on other firms in their region. The preferential treatments given to state regional firms have, if any, positive effects on other regional firms.102

339. Thus, the key differences between the effects of capture if one distinguishes by the type of owner controlling the captor are in not the distinction between state vs. private ownership and control, but in the distinction between federal vs. regional interests. Once again this analysis and the results confirm the importance, which the structure of federal relationships has for the mode of operation of Russia’s economy.

(j) Summary

340. The data set on ownership and control in Russia introduced in this section represents what “the market”, in the guise of surveyed market participants, believed in the summer of 2003; and not data taken from official records or registrars. This also explains why the discussion has centered on who effectively controls Russia rather than who officially owns it.

341. Of course, the possibility of unintentional bias in the results cannot be excluded. But every effort was taken to ensure that estimates are conservative and that any error is on the side of caution. The data set itself will be made available to Russian researchers.

342. This is the first detailed data set on ownership and control in Russia. It covers about 1700 large firms, listed and unlisted, employing 4.3 million people. Sales figures were only used for the industrial sub-sectors in the sample, and totaled 5.2 trillion rubles. The industry part of the sample represents 22 percent of Russia’s industrial employment and 66 percent of industrial output. Banks included in the database cover 68 percent of assets in the banking sector. Construction and service businesses in the sample account for a much smaller fraction of economic activity in their sectors. These patterns in the database are driven by the selection criteria and the underlying degree of sector concentration, as discussed.

343. Using a reasonable cut-off definition by the amount of employment and sales controlled, we identified 22 large private owners who control 47 percent of employment and 45 percent of sales in the sample (the sales refer only to the industry part of the sample). Their share in the sample is higher than all other private owners (including foreigners) combined, and higher than the share of regional and federal governments combined.

344. The data were used to address three principle questions: first, how concentrated is ownership in Russia's economy; second, what are the implications of this concentration for economic performance; and, third, what does the data show us about "state capture", i.e. the ability of business to obtain preferential treatment from regional government?

102 An insufficient number of observations does not allow inferences about the effect of capture by firms with dispersed ownership.
The sample reveals two important general characteristics of ownership structure in Russia. First, ownership within firms is highly concentrated in all segments of the private sector, i.e. in small and large firms alike, and also whether controlled by big business or by small owners. Second, comparison of ownership concentration within industries and at the economy level shows that the group of largest domestic private owners (and their business groups) not only dominate selected industries but that many of them control large firms across many industries.

The data support the conventional wisdom that company ownership in Russia is highly concentrated, though less so than suggested by previous studies (which looked only at small samples of listed companies or tracked the holdings of individual owners). Moreover, the degree of concentration is distributed very unevenly across sectors. The 22 largest private owners and their financial-industrial groups (FIGs) tend to control enterprises in sectors where average firm size is large. Large sectors (and sectors comprised of large firms) therefore tend to display concentrated ownership, while small sectors (and sectors comprised of small firms) tend to be fragmented.

Control by the group of Russian large private owners is most evident in a number of “strategic” sub-sectors: oil and raw materials, automobiles, and chemicals. The federal government controls a smaller number of equally important industries, such as gas, energy, and the pipeline system. Control by regional government tends to be pronounced in a small number of manufacturing sub-sectors, where it typically coincides with a sizeable federal government presence. Finally, foreign ownership is also highly sector specific and is particularly noticeable in production of final consumption goods. However, in most parts of the economy, ownership and control is not particularly concentrated, and there is a preponderance of smaller, domestic private owners.

Judgments about economic performance, arising from the survey, must be cautious in view of measurement problems. It is particularly important that the sample, by its nature, offers a snapshot at two points in time, whereas many of the questions it seeks to answer are of a more long-term nature. Nevertheless, two general conclusions about economic performance can be drawn.

First, financial-industrial groups with significant ownership rights nationwide do not, as a rule, outperform smaller private domestic owners. Second, nothing in the data supports the conclusion that state-owned firms, whether owned by federal or regional government, perform better than the group of private owners. Moreover, firms controlled by foreigners have higher productivity levels in both years, and firms owned by foreigners as well as those owned by the largest private owners demonstrated higher total factor productivity growth between 2001 and 2002 than other companies. Hence the analysis doesn’t provide an argument for re-nationalization in any shape or form, no matter how the current ownership rights were established. There also appears no reason for the arbitrary splitting up or bankrupting of commercial companies. Instead, the potential “dark side” of large owners, i.e. their ability to obtain unfair advantages by co-opting state authorities or by colluding with each other, needs to be addressed in Russia, like anywhere else in the world, by establishing clear rules for competition policies designed to protect market competition. And in Russia, as everywhere, the task of effective antitrust legislation is to protect market competition, but not to restrict ex-ante the size or to interfere with market based interaction of companies, be they large or small, private or state owned.

Further, these rules, and the policies guiding competition, have to be binding for all players, be they private or state-owned, and as far removed from arbitrary or discretionary intervention as conceivable. The need for secondary markets and institutions that could support faster consolidation on the firm level confirms the need for a clear set of rules of engagement,
the development of an independent court system, and support for competition from abroad in order to guarantee efficient competition on domestic markets. The conclusion that a rule-based system is necessary to safeguard competition at all levels of the economy (among new entrants as well as large concerns) is nothing new. It is the opposite of advocating the arbitrary “guerilla warfare” against “big” business that in the perception of many has taken hold in Russia. In order for rules and institutions to protect markets, they must apply to all players alike, be they public bodies or private owners.

351. Against this background, any review and potential revisions of previous privatization are unadvisable. It is unclear who would be the judge under present circumstances, and it appears all too clear that re-privatization, if intended, could not be organized any more fairly a second time around. No potential gain from re-nationalization could even remotely offset the damage to the security of property rights, which such a maneuver would entail.

352. The third question, about preferential treatment of different categories of owners and how it may impact aggregate economic performance, was approached by matching existing data, which measures preferential treatment by analyzing special provisions in regional legislation, with the new CEM data base on ownership. The focus is therefore on lobbying activities and diversion of state resources at the regional level.

353. The results indicate that the likelihood of getting preferential treatment in regional legislation increases if an individual firm is a member of a business group, and increases with the size of the business group and the ranking of the firm in the group. The results also show that of all the different ownership categories, firms controlled by regional private owners (who are not active nationally) and firms controlled by foreign investors are most likely to receive preferential treatment from regional governments, while firms controlled by the group of largest owners, who operate nationally, and firms with dispersed private ownership are least likely to receive preferential treatment.

354. The data also give a first glimpse of the effects of successful lobbying for preferential treatment at the regional level. Interestingly, both the benefits from receiving preferential treatment as well as the negative impact on growth and economic performance of other firms in a region – and therefore usually on aggregate economic performance – is greatest if nationwide financial-industrial groups “move into” the region and secure preferential treatment. Regional preferential treatment for groups that emerged from the loans-for shares privatization schemes is similarly damaging for the relevant region. Preferential treatment of foreign companies also has a consistently negative effect on other domestic firms operating in the region.

355. By contrast, preferential treatment for private owners, based in the relevant region, or for firms owned by regional government does not have a significant adverse impact on other regional firms: coefficients would even indicate a positive effect in some performance measures. The natural conclusion is that the damaging impact on other regional firms is of no concern to foreigners and nationwide business groups (perhaps because they do not compete in regional markets but only produce there, as in the case of energy exploitation), or is even desirable for them because it eliminates competition. Regionally owned firms presumably have limited bargaining power with regional governments, or, if owned by the regional authorities, have other incentives to worry about. Both of these factors will put constraints on their propensity or capacity to hurt other regional firms, which will typically also be constituents of this same government.

356. In summary, both the positive and the negative aspects of ownership concentration in developing economies are visible in Russia. Large financial-industrial groups, with interests
spread across the country, have access to and make use of investment resources that can accelerate growth beyond the natural-resource sectors. By branching out of their core sectors (or at least maintaining diversification across sectors, which they obtained at initial privatization) and investing more than other domestic players, they play a major role in consolidation of firm size, which was identified as a key ingredient for expeditious future restructuring in Russia (see section C4).

357. On the negative side, the CEM regional data show that Russian financial-industrial groups also act like similar groups anywhere in the world, exploiting their power and quite capable of, in the words of Adam Smith, “conspiring against the public good”. Business groups that operate on a national scale (including groups, which arose from the loans-for-shares privatizations) and foreign companies emerge as the most effective and the least benign “captors” of regional governments. Although large domestic groups receive preferential treatment from regional government less often than other firms, preferential treatment brings them higher-than-average benefits, and other firms in the region suffer more from resulting distortion of the institutional environment than if preferential treatment is given to other companies, including state-owned firms.

358. We hope that the ownership data set, which we are making available to researchers, will trigger continued substantive discussion of the economic issues involved, particularly of how to harness the benefits of concentrated ownership and activities of Russian big business for economic growth while avoiding attendant pitfalls. The policy points arising from this chapter are as follows:

➤ To function properly, markets everywhere need a framework of rules to ensure competition. These include protection of fundamental property rights, but also rules that ensure competition and minimize the risk of unbalanced market power, monopolization and cartel building, which would stifle rapid economic growth and faster economic development. The lessons of history show that upholding and protecting a competitive framework is crucial for nurturing rapid development, vibrant economies and high rates of growth.

➤ This leads straight to the need for realistic antitrust and antimonopoly policies, and agencies capable of enforcing such policies. Much has been done in Russia to deregulate and protect new, small- and medium-sized businesses in recent years. But rules to ensure competition at all levels of the economy are equally important for nurturing Russia’s economic growth potential, and such rules have not yet been developed to the same level of quality. This is not merely a problem of implementation, since existing legislation appears largely outdated. It is also crucial that a rule-based antitrust system should be binding for all parties, including the state.

➤ Continued international integration (including WTO entry) is another device for encouraging competition, particularly in sectors, which are dominated by very large domestic firms and therefore pose entry problems for smaller, and less cash-rich, domestic competitors. Efficiency, growth and consumers themselves all gain from competitive entrants from outside. Economic policies should encourage competition from abroad in product markets and, more importantly, they should encourage foreign investment, most of all into sectors dominated by a few, very large owners.

➤ A third, and no less important, device for bridging the tension between the market power of large players and the need for further consolidation on the firm level, is the establishment of better secondary markets for trading ownership rights. From today’s vantage point, of all the issues that may have gone unexpectedly wrong with Russia’s privatization program, in order
of importance, surely the absence of such markets ten years later must surely top the list. Without them, it will be hard to correct some of the results that now hamper efficiency, and without them it will also be hard to avoid a competition policy that is excessively interventionist, and without them it will remain hard to allocate resources so that they maximize growth in the future.

- Russia has a multitude of small firms thriving in many sectors of the economy (section C2). These firms need access to capital. Russia also has a multitude of companies in need of restructuring, and section C4 of this report tried to show why this increases economic pressure for consolidation on the firm level. This section (C5) has outlined some of the risks and limitations of leaving that task to FIGs alone. Availability of capital and firm-level consolidation could be encouraged, without any interference in markets, by faster development of financial sector infrastructure (supported by strengthening of the judicial system).

359. State-owned firms in the sample perform particularly badly, which should not come as a surprise. The way forward is evident from the experience of economic history worldwide. It is based on protection of private property, strict antitrust policies, free competition and global integration. Russia needs to create a modern framework for competition policy while remaining open to foreign competition. This may require overcoming powerful interest groups, but the ultimate reward will be to eliminate incentives that reward size for the wrong reasons, and to unlock the potential for rapid growth at all levels of ownership.
D. CONCLUSION

360. The analysis in this report does not lend itself to neat formulation of policy conclusions, although a number of specific implications for policy are included in each section. Here we offer some general observations that follow from the analysis and that relate particularly to three central questions. Two were raised in the introduction, and the third follows from their answer. What is the link between structural change and rapid economic growth? What is the link between structural change, growth and diversification of the economy? How should tasks be divided between the public and private sectors in order to harness the benefits of structural change?

361. The economic structure that Russia inherited was severely distorted, and its rectification requires further effort. The consequences are still apparent in the need to reallocate human as well as physical capital across space, across skill and employment profiles, from old to new production facilities, and within enterprises. However, there are large potential rewards in the form of productivity gains if these adjustments can be made.

362. This is not a simple relationship. The report shows that, based on standard indicators, structural change has slowed down markedly since Russia started to grow (see C3). However, Russia has the resources to speed up the necessary adjustments, and this study indicates that much of the task can be accomplished in a constructive way (i.e., not just by job reductions). For example, people’s ability to relocate (both spatially and from job to job) will increase if investing is made in transport infrastructure and, even more important, in education (see section C2).

363. Diversification is a top priority for structural reform in Russia, as it would be for any economy where 1 percent of the workforce creates about 20 percent of GDP. Lessening the dependence on oil and gas will enable Russia to escape vulnerability to international price changes – and to overcome a situation in which growth has climbed above 5 percent only when hydrocarbon prices have increased (Part B). Policy makers need to be continually aware of the risk facing all large natural-resource producers where a wealthy few acquire control over resources and the remainder of the population lives in poverty.

364. The data in this report give some very clear answers concerning interventionist policies to achieve diversification, and resource transfers by the state. First, diversification is already taking place, and it is taking place precisely where hard budget constraints have prompted structural adjustment and the government has retreated from the marketplace. One example of this is the large movement of people to a sizable service sector which hardly existed a decade ago (see section C2). Second, the report finds that privately owned companies outperform their state-owned comparators in many dimensions (see, for example, the intersectoral comparisons in section C2, or the impact of a productivity wedge between private and public companies in the oil and gas sector discussed in section C3).

365. The report provides examples of the perils of state intervention in Russia. It highlights the increase in surplus public-sector employment, ultimately financed by hydrocarbon revenues, which discourages people from shifting out of previous locations and bloats the public sector payroll, creating conditions for an employment crisis when the financing dries up (see section C2). Evidence of blurred borderlines between private and public interests (see section C5) raises further doubts that industrial policy interventions could be carried out while a competitive environment is being maintained. The report also shows how complex the task of structural adjustment can be—for example, in the slow development of labor productivity differentials across sectors (see section C3), and the complex and multidimensional
nature of restructuring within sectors (see section C4). Transferring these tasks, or others of similar complexity, to government agencies or employees entrusted with pre-determining “winners” (sectors or firms) will not work.

366. The report discusses the relationship between the public and private sectors in Russia or, more precisely, the apparent growing gap in the way both sectors carry out their respective functions. The data show progress in the transforming of the private sector, which in many ways is outpacing public sector transformation. But a modern economy needs both sectors. This performance gap makes the task of accelerating structural change more difficult.

367. This is true in a number of areas. First, investments in transportation and in education are important in generating incentives and conditions under which people can move to find employment elsewhere, if the need arises (section C3). However, neither direct incentives nor the public sector reforms necessary to provide better education or transport infrastructure have made sufficient progress, despite high oil revenues. Second, energy subsidies and below-cost pricing for gas and electricity may have been necessary in certain locations, but they maintain an uncompetitive industrial base dependent on these subsidies. Energy subsidies encourage the installation of energy-inefficient equipment, generating future problems for Russia’s international competitiveness (section B). These subsidies should be phased out as rapidly as possible now that growth is finally being driven by investment.

368. Government initiative is also needed to push financial-sector reforms, without which liquidity inflows and lack of infrastructure may combine to create short-term volatility in certain markets without satisfying the investment needs of Russia’s real sector (see section C4). Lack of a level playing field across sectors and regions owing to incoherent administrative intervention and law enforcement is yet another issue that needs government attention, and the report shows how companies have been able to adjust their income statements at the expense of public revenues through transfer pricing (section C3). Transfer pricing is but one example of the need to introduce rules that protect competition in all market segments and among all market participants.

369. At present, Russia’s economy is dominated by a small group of powerful companies and their owners. In order to maximize the beneficial effects for the economy from big business activities, Russia requires legislation and institutions that safeguard competition – a regulatory framework that will prevent Adam Smith’s “conspiracy against the public good” without putting big business or other firms into a straightjacket.

370. As has been noted in the report, the way forward lies in the protection of private property, strict antitrust policies, free competition and global integration. Advances in this direction may need to overcome powerful interest groups, but the ultimate reward will be a business environment that can unlock the potential for rapid growth at all levels of ownership, and in all parts of society.

371. Russia’s economy has come a very long way – from the (now almost forgotten) days of rationing and centralized control, but also from the chaotic first phase of its transition toward a market economy, which culminated in the 1998 default. It is undeniable that good luck in the guise of high natural resource prices has played a role since then. But the massive structural adjustments now under way are not a matter of luck. The hope must be that the public sector is willing and capable of carrying out further reforms, so that Russia will not be a hostage to fortune in the future.
E. REFERENCES


F. ANNEX

Table F.1 Firms Controlled by the Group of Largest Owners Did Not Perform Better than Independent Private Owners in both 2001 and 2002

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large private owners</td>
<td>log Y_{it}</td>
<td>log Y_{it}</td>
</tr>
<tr>
<td></td>
<td>-0.163</td>
<td>-0.182</td>
</tr>
<tr>
<td></td>
<td>(2.20)**</td>
<td>(2.39)**</td>
</tr>
<tr>
<td>Foreign</td>
<td>0.261</td>
<td>0.464</td>
</tr>
<tr>
<td></td>
<td>(1.94)*</td>
<td>(3.35)**</td>
</tr>
<tr>
<td>Federal</td>
<td>0.041</td>
<td>-0.04</td>
</tr>
<tr>
<td></td>
<td>-0.3</td>
<td>-0.29</td>
</tr>
<tr>
<td>Regional</td>
<td>-0.099</td>
<td>0.139</td>
</tr>
<tr>
<td></td>
<td>-0.75</td>
<td>-1.00</td>
</tr>
<tr>
<td>log L_{it}</td>
<td>0.792</td>
<td>1.091</td>
</tr>
<tr>
<td></td>
<td>(17.27)**</td>
<td>(40.61)**</td>
</tr>
<tr>
<td>log K_{it}</td>
<td>0.265</td>
<td>0.221</td>
</tr>
<tr>
<td></td>
<td>(8.44)**</td>
<td>(7.11)**</td>
</tr>
<tr>
<td>Observations</td>
<td>1040</td>
<td>1149</td>
</tr>
<tr>
<td>Adj R2</td>
<td>0.87</td>
<td>0.86</td>
</tr>
</tbody>
</table>

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Robust statistics in parentheses. The definition of control is based on the type of largest controlling stake holder given that the stake is at least 25%. The omitted category is “other private domestic owner,” dummy for “no controlling owner” included but not reported. Dummy variables for regions and industries are included. Outliers: 1% highest and 1% lowest observations of log(Y_{it}), log(K_{it}), and log(L_{it}) are excluded.
Table F.2 Firms Controlled by the Group of Largest Owners Outperform other Russian Owners in Terms of Productivity Growth 2001-2002

<table>
<thead>
<tr>
<th></th>
<th>Productivity growth</th>
<th>Growth in sales, employment, and assets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Change in log Y</td>
<td>Change in log Y/L</td>
</tr>
<tr>
<td></td>
<td>Change in log Y</td>
<td>Change in log Y/L</td>
</tr>
<tr>
<td></td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>(2.32)**</td>
<td>(2.29)**</td>
</tr>
<tr>
<td></td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>(2.01)**</td>
<td>(2.06)**</td>
</tr>
<tr>
<td></td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>-0.15</td>
<td>-0.12</td>
</tr>
<tr>
<td></td>
<td>-0.10</td>
<td>-0.10</td>
</tr>
<tr>
<td></td>
<td>-1.06</td>
<td>-1.09</td>
</tr>
<tr>
<td></td>
<td>0.60</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>(7.11)***</td>
<td>(7.33)***</td>
</tr>
<tr>
<td></td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1.07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1005</td>
<td>1005</td>
</tr>
<tr>
<td></td>
<td>0.34</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>0.51</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>0.19</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Robust statistics in parentheses. The definition of control is based on the type of largest controlling stakeholder given that the stake is at least 25%. The omitted category is “other private domestic owner,” dummy for “no controlling owner” included but not reported. Dummy variables for regions and industries are included. Outliers: 1% highest and 1% lowest observations of log(Y_{2002}/Y_{2001}), log(K_{2002}/K_{2001}), and log(L_{2002}/L_{2001}) are excluded.
Sample and Regression Results for the State Capture Analysis

Table F.3 Regional Distribution of Firms in the Sample

<table>
<thead>
<tr>
<th>Region name</th>
<th>Number of firms</th>
<th>Region name</th>
<th>Number of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sverdlovsk oblast</td>
<td>9</td>
<td>Bashkortostan rep.</td>
<td>5</td>
</tr>
<tr>
<td>Moscow city</td>
<td>9</td>
<td>Karelia republic</td>
<td>5</td>
</tr>
<tr>
<td>Khabarovsk krai</td>
<td>8</td>
<td>Tatarstan republic</td>
<td>5</td>
</tr>
<tr>
<td>Kaliningrad oblast</td>
<td>8</td>
<td>Udmurtia Republic</td>
<td>5</td>
</tr>
<tr>
<td>Orenburg oblast</td>
<td>8</td>
<td>Stavropol krai</td>
<td>5</td>
</tr>
<tr>
<td>Perm oblast</td>
<td>8</td>
<td>Kamchatka oblast</td>
<td>5</td>
</tr>
<tr>
<td>Rostov oblast</td>
<td>8</td>
<td>Sakhalin oblast</td>
<td>5</td>
</tr>
<tr>
<td>Samara oblast</td>
<td>8</td>
<td>Ulyanovsk oblast</td>
<td>5</td>
</tr>
<tr>
<td>Tyumen oblast</td>
<td>8</td>
<td>Chelyabinsk oblast</td>
<td>5</td>
</tr>
<tr>
<td>Yaroslavl oblast</td>
<td>8</td>
<td>Sakha republic</td>
<td>4</td>
</tr>
<tr>
<td>Irkutsk oblast</td>
<td>7</td>
<td>Krasnodar krai</td>
<td>4</td>
</tr>
<tr>
<td>St. Petersburg city</td>
<td>7</td>
<td>Krasnoyarsk krai</td>
<td>4</td>
</tr>
<tr>
<td>Primorski krai</td>
<td>6</td>
<td>Amur oblast</td>
<td>4</td>
</tr>
<tr>
<td>Arkhangelsk oblast</td>
<td>6</td>
<td>Vologda oblast</td>
<td>4</td>
</tr>
<tr>
<td>Belgorod oblast</td>
<td>6</td>
<td>Kirov oblast</td>
<td>4</td>
</tr>
<tr>
<td>Bryansk oblast</td>
<td>6</td>
<td>Kursk oblast</td>
<td>4</td>
</tr>
<tr>
<td>Volgograd oblast</td>
<td>6</td>
<td>Lipetsk oblast</td>
<td>4</td>
</tr>
<tr>
<td>Kemerovo oblast</td>
<td>6</td>
<td>Novgorod oblast</td>
<td>4</td>
</tr>
<tr>
<td>Moscow oblast</td>
<td>6</td>
<td>Penza oblast</td>
<td>4</td>
</tr>
<tr>
<td>Murmansk oblast</td>
<td>6</td>
<td>Tver oblast</td>
<td>4</td>
</tr>
<tr>
<td>N. Novgorod oblast</td>
<td>6</td>
<td>Remaining 23 regions</td>
<td>44</td>
</tr>
<tr>
<td>Omsk oblast</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomsk oblast</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tula oblast</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table F.4 Distribution of Firms in the Sample by Industry

<table>
<thead>
<tr>
<th>Industry</th>
<th># of firms</th>
<th>Industry</th>
<th># of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>44</td>
<td>Tobacco</td>
<td>7</td>
</tr>
<tr>
<td>Oil</td>
<td>42</td>
<td>Gas</td>
<td>6</td>
</tr>
<tr>
<td>Ferrous met.</td>
<td>19</td>
<td>Pipes</td>
<td>5</td>
</tr>
<tr>
<td>Auto</td>
<td>18</td>
<td>Beer</td>
<td>4</td>
</tr>
<tr>
<td>Coal</td>
<td>14</td>
<td>Meat</td>
<td>4</td>
</tr>
<tr>
<td>Fish</td>
<td>14</td>
<td>Milk</td>
<td>4</td>
</tr>
<tr>
<td>Pulp</td>
<td>13</td>
<td>Mill</td>
<td>4</td>
</tr>
<tr>
<td>P. Chemicals</td>
<td>12</td>
<td>Jewelry</td>
<td>3</td>
</tr>
<tr>
<td>Aluminum</td>
<td>11</td>
<td>Non-alcohol dr.</td>
<td>3</td>
</tr>
<tr>
<td>Machinery</td>
<td>11</td>
<td>Cable</td>
<td>3</td>
</tr>
<tr>
<td>Confectionery</td>
<td>10</td>
<td>Timber</td>
<td>3</td>
</tr>
<tr>
<td>Nonferrous met.</td>
<td>10</td>
<td>Trade energy</td>
<td>2</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>8</td>
<td>Vodka</td>
<td>2</td>
</tr>
<tr>
<td>Tire</td>
<td>8</td>
<td>Furniture</td>
<td>2</td>
</tr>
<tr>
<td>Ore</td>
<td>7</td>
<td>Polygraph</td>
<td>1</td>
</tr>
<tr>
<td>Rubber</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure F.1 Average Number of Preferential Treatments per Firm in the Sample

![Average number of preferential treatments](image)
Table F.5 OLS. Between Effects. Who Receives Preferential Treatment?

<table>
<thead>
<tr>
<th>Share of preferential treatment</th>
<th>Ultimate controlling owner of a group 0.12 [2.10]**</th>
<th>Controlling owner of a firm 0.04 [0.02]*</th>
<th>Dummy – Regional private owner 0.04 [0.03]*</th>
<th>Dummy – Foreign owner 0.08 [0.03]**</th>
<th>Dummy – Dispersed ownership 0.07 [0.05]</th>
<th>Dummy – Federal private large owner -0.03 [0.02]**</th>
<th>Dummy – Loans for shares 0.03 [0.02]*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log (number of firms in group)</td>
<td>0.01 [0.01]*</td>
<td>0.02 [0.01]**</td>
<td>0.01 [0.01]*</td>
<td>0.01 [0.01]*</td>
<td>0.01 [0.01]**</td>
<td>Log (initial employment) 0.02 [3.56]**</td>
<td>0.01 [0.01]**</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.05 [0.91]</td>
<td>0.01 [0.04]</td>
<td>-0.07 [0.05]</td>
<td>0 [0.04]</td>
<td>0 [0.04]</td>
<td>Observations 1308</td>
<td>1374</td>
</tr>
<tr>
<td>Number of firms</td>
<td>289</td>
<td>290</td>
<td>290</td>
<td>290</td>
<td>290</td>
<td>R-squared 0.05</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Note: T-statistics are in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%.
Table F.6 OLS, Between Effects: Effects of Capture by Federally Active FIGs on Non-Captor Firms

<table>
<thead>
<tr>
<th></th>
<th>Productivity</th>
<th>Profitability</th>
<th>Sales</th>
<th>Fixed assets</th>
<th>Employment</th>
<th>Regiona l market share</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTC_F.O. (effect of IS by fed. FIG on non-captors)</td>
<td>-1.6</td>
<td>-3.06</td>
<td>-3.1</td>
<td>-0.33</td>
<td>-1.72</td>
<td>-0.38</td>
</tr>
<tr>
<td>(effect of IS by fed. FIG on non-captors)</td>
<td>[0.80]**</td>
<td>[1.61]*</td>
<td>[1.46]</td>
<td>[0.91]</td>
<td>[0.68]**</td>
<td>[0.15]**</td>
</tr>
<tr>
<td>D_PTS *PTC_F.O. (difference in effects on captors and non-captors)</td>
<td>0.88</td>
<td>5.23</td>
<td>4.17</td>
<td>1.72</td>
<td>1.16</td>
<td>0.53</td>
</tr>
<tr>
<td>(difference in effects on captors and non-captors)</td>
<td>[1.25]</td>
<td>[2.52]**</td>
<td>[2.26]</td>
<td>[1.41]</td>
<td>[1.07]</td>
<td>[0.24]**</td>
</tr>
<tr>
<td>D_PTS</td>
<td>0.07</td>
<td>-1.94</td>
<td>-1.25</td>
<td>0.1</td>
<td>0.12</td>
<td>-0.1</td>
</tr>
<tr>
<td>Initial level of depend variable</td>
<td>[0.44]</td>
<td>[0.89]**</td>
<td>[0.50]</td>
<td>[0.38]</td>
<td>[0.08]</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.02</td>
<td>3.43</td>
<td>6.77</td>
<td>0.9</td>
<td>-2.25</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>[0.06]</td>
<td>[0.08]***</td>
<td>[0.56]</td>
<td>[0.37]***</td>
<td>0.39</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>472</td>
<td>458</td>
<td>459</td>
<td>464</td>
<td>473</td>
<td>501</td>
</tr>
<tr>
<td>Number of firms</td>
<td>211</td>
<td>201</td>
<td>202</td>
<td>206</td>
<td>212</td>
<td>218</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.03</td>
<td>0.2</td>
<td>0.12</td>
<td>0.48</td>
<td>0.39</td>
<td>0.61</td>
</tr>
</tbody>
</table>
### Table F.7 Between Effects: Effect of Capture by Firms in Loans-for-shares Groups on Non-captor Firms

<table>
<thead>
<tr>
<th></th>
<th>Productivity</th>
<th>Profitability</th>
<th>Sales</th>
<th>Fixed Assets</th>
<th>Employment</th>
<th>Regional Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTC_L. for S.</td>
<td>-1.45</td>
<td>-3.95</td>
<td>-3.78</td>
<td>-1.03</td>
<td>-0.74</td>
<td>-0.2</td>
</tr>
<tr>
<td>(effect of IS by loans for shares on non-captors)</td>
<td>[0.65]**</td>
<td>[1.29]***</td>
<td>[1.13]</td>
<td>[0.71]</td>
<td>[0.53]</td>
<td>[0.12]*</td>
</tr>
<tr>
<td>D_PTS * PTC_L. for S.</td>
<td>0.89</td>
<td>4.91</td>
<td>4.54</td>
<td>1.52</td>
<td>0.44</td>
<td>0.41</td>
</tr>
<tr>
<td>(difference in effects on captors and non-captors)</td>
<td>[1.04]</td>
<td>[2.07]**</td>
<td>[1.81]</td>
<td>[1.16]</td>
<td>[0.88]</td>
<td>[0.20]**</td>
</tr>
<tr>
<td>D_PTS</td>
<td>-0.14</td>
<td>-1.57</td>
<td>-1.34</td>
<td>0.04</td>
<td>0.24</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>[0.41]</td>
<td>[0.82]*</td>
<td>[0.46]</td>
<td>[0.35]</td>
<td>[0.08]</td>
<td></td>
</tr>
<tr>
<td>Initial level of depend variable</td>
<td>[0.06]**</td>
<td>[0.08]***</td>
<td>*</td>
<td>[0.04]***</td>
<td>[0.04]**</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.42</td>
<td>3.11</td>
<td>6.18</td>
<td>0.52</td>
<td>-2.57</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>[0.36]</td>
<td>[0.96]***</td>
<td>[1.09]</td>
<td>[0.54]</td>
<td>[0.36]**</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>464</td>
<td>450</td>
<td>451</td>
<td>456</td>
<td>465</td>
<td>491</td>
</tr>
<tr>
<td>Number of firms</td>
<td>217</td>
<td>207</td>
<td>208</td>
<td>212</td>
<td>218</td>
<td>224</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.04</td>
<td>0.21</td>
<td>0.15</td>
<td>0.5</td>
<td>0.4</td>
<td>0.58</td>
</tr>
</tbody>
</table>

* R-squared values or other statistical measures.