

WP8. The analysis of outward migration in selected CIS countries

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Objectives

The aim of WP8 is to better understand the impact of migration and remittances on household welfare, structural change, and economic growth in selected CIS countries. While the immediate impact on households has been studied extensively through household-level analyses, we focus on second-round, or general equilibrium effects. To this end, we construct computable general equilibrium (CGE) models for several net emigration countries - Moldova, Ukraine, Georgia, and Kyrgyzstan – as well as for Russia, which has both emigration and immigration. These models will be used to simulate the combined, direct and indirect, effects of migration and remittances.

Progress to date

Our CGE models are based on the widely used and documented IFPRI (International Food Policy Research Institute) standard CGE model. During the first phase of the workpackage that has just been concluded, we have focussed on developing databases for our selected countries and running a set of purely illustrative simulations, using the basic comparative-static version of the standard IFPRI model.

In constructing the databases, we combine national accounts with household budget surveys and labor force statistics in order to distinguish between different household types and skill categories for labor. A key difficulty is that official data sources understate migration and remittances in many countries because a large proportion of remittances is transferred as foreign exchange cash and much migrant employment is informal. For the databases to reflect realistic orders of magnitudes, various data sources are therefore drawn upon and necessary adjustments made in the social accounting matrices.

In the following sections, we briefly review the work done for each of the five countries. We discuss data availability, any resulting issues in the compilation of the database, the key characteristics of the social accounting matrix, and conclusions from our preliminary simulations.

Moldova

Migration and remittances play a key role in the Moldovan economy, with approximate one quarter of the working-age population working abroad for at least part of the year, and remittances equivalent to one third of GDP in 2006. Available data include the national accounts through 2004, which include an input-output table, annual household budget surveys through 2004, quarterly labor force surveys through 2005, and a special household survey on migration and remittances conducted in 2004 and 2006. As is the case in many developing countries, coverage of household income by the household budget survey is far from complete, particularly for remittances. Therefore, the national accounts data, which are internally consistent, have been used as the starting point in compiling the social accounting matrix. Subsequently, the household sector and labor income have been disaggregated using percentage shares for different household and labor types derived from the household budget survey.

The social accounting matrix for Moldova is based on the year 2004. It includes 16 sectors, 6 types of households (see attached table), and 6 factors of production (low-skilled, medium-skilled, high-skilled labor, agricultural self-employment, non-

agricultural self-employment, capital). The agricultural sector is subdivided into small-scale (household) agriculture, which uses only "agricultural self-employment" as its only factor of production, and agricultural enterprises with use the standard factors of production. Households are categorized by their primary source of income.

The intuition behind the illustrative simulations is to ask what the Moldovan economy would have looked like 2004 without labor migration and remittances. The first illustrative simulation describes the impact of strong growth in total factor productivity (TFP) since the economic crisis in 1998. While TFP growth may be partly a natural result of recovery from a transition-induced crisis, it is difficult to disentangle this "natural recovery" from the higher capacity utilization that is a result of higher remittance-induced demand. At this preliminary stage in the analysis, we assume that TFP growth is at least partly migration-and-remittances-induced.

The second and third simulation separately describe the impact of a sharp reduction in remittances and a larger domestic labor supply (if there is no labor migration). The fourth simulation combines lower remittances and larger labor supply, and the fifth simulation adds lower TFP. While these illustrative results should be treated with much caution, one rather robust conclusion is that small farmer households, a rather poor group, have gained the most from migration and remittances (or technically, would lose the most if remittances and migration were reduced from their already high 2004 level). Unsurprisingly, also, remittances and emigration lead to higher private consumption and domestic absorption (fixed investment and government consumption are held constant in these simulations), a small real appreciation, and a Dutch disease effect with output increases in agriculture (not very tradable) and falling output in light industry (the major tradable sector with significant exports).

Ukraine

According to several alternative studies, the overall stock of Ukrainian migrants working abroad during the late 1990s and early 2000s ranged from 0.8 to 2 million persons. The latest ILO survey reveals about 780,000 Ukrainians labor migrants abroad (about 3.5 - 4% of total labor force). These numbers sharply contrast with much lower official statistics on labour migration provided by State Statistics Committee. Only 56,500 permits have been given to Ukrainian nationals for legal employment abroad by resident employment companies in 2005. Since 1996, over 65 percent of work permits have been granted to workers going to the EU countries.

The true scale of Ukrainian labour migrants' presence in some European countries was revealed during regularization programs. In 2002 the Italian government ran a two-month regularization program for domestic workers and contract workers. Out of 341 000 of applications from domestic workers, 27 percent were submitted by Ukrainians. During the regularization program in Portugal from January 2001 till March 2003, more than 62,000 temporary work permits (out of a total of 180,000) were granted to Ukrainians.

Remittances are crucial for many Ukrainian households and regions. Anecdotal evidence suggests that remittances-induced domestic demand was the key factor of dynamic development of local manufacturing in Western Ukraine. Migrants' remittances are spent in a number of ways: according to results of regional survey, most money earned abroad are spent on purchases of real estate, repairing of dwelling, purchases of cars, material aid for relatives, and payment for high

education. Obviously remittances have lots of indirect effects as they further induce demand through multiplier effects. Moreover, some returning migrants invest money in new start-ups increasing economic potential of regional economies in long-run.

Our social accounting matrix for Ukraine (input data for standard IFRPI model) is based on input-output tables at basic and consumer prices, National Accounts of Ukraine, the balance of payments, the Statistical Appendix to the November 2005 IMF country report on Ukraine, and Household Budget Survey raw data for the fourth quarter of 2004. The quarterly household survey covers a sample of about 10060 households and 25,700 household members. We distinguish 16 sectors (including small-scale and large-scale agricultural production) and 6 factors of production (including low-, medium-, and high-skilled labor). In disaggregating the household sector, we deviate from our practice for the more agricultural countries (such as Moldova) by not including agricultural smallholders separately because they account for less than 1 percent of all households in Ukraine.

Statistics on migrants' remittances in Ukraine are fragmentary. The household budget survey does not distinguish remittances as a separate type of income source. Presumably, respondents counted remittances as a part of "other income". However, the distribution of "other incomes" across types of households does not correspond to the likely pattern of remittances in Ukraine. For example, "rich" (top 2 deciles in terms of per capita income) urban households have more than twice as much "other income" as "normal" urban households although it is unlikely that "normal" households benefit from migrant's remittances to a lesser extent than "rich" households. Thus, the statistics were adjusted so as to reflect a plausible distribution of remittances across different types of households.

Official statistics on total workers' remittances and labor income abroad are far from complete and reliable. According to the balance of payments, Ukrainian workers received USD 171 million of factor income abroad and transferred USD 193 million as remittances in 2004. This is unrealistically low, given large-scale labor out-migration from Ukraine. In order to upgrade statistics we classify transfers to "other sectors" as workers' remittances in line with the OECD recommendations (Trends of International Migration, SOPEMI, 2005). This gives us more realistic overall USD 2,219 million of transfers into Ukraine (equals to 7 percent of total household's consumption).

Simulation results for the Ukrainian CGE model are qualitatively similar to those for Moldova. However, we use a different set of parameter changes to estimate basic macroeconomic indicators for the hypothetical "remittances-and-migration free" Ukrainian economy, given that migration and remittances in Ukraine are less predominant than in Moldova. TFP is reduced by 10 percent (scenario 1), remittances are reduced by 70 percent (scenario 2), and labor supply increased by 5 percent (scenario 3) – see Table 1.

Results of simulations reveal that the "pure" effect of remittances was quite modest. However, indirect effects of migration appear to be much more substantial. First, some part of increase in TFP can be attributed to remittance-induced demand. Second, in case of "no migration", the economy would have benefited from higher supply of labor which, *ceteris paribus*, would have led to better macroeconomic performance. The net effect of remittances (accounting for both direct and indirect effects) proves to be impressive. The 2004 hypothetical economy would have lost about 7.1% of its potential without migration and remittances induced effects.

Light and food industry are the key beneficiaries of demand effects due to remittances. These sectors would have contracted by about 17 percent and 14 percent if the economy did not benefit from workers' transfers. On the other hand, machinery, construction and public administration services seem to be quite remittance-neutral sectors.

All types of households benefit substantially from remittances: their overall consumption would have been lower by 14 to 21 percent in the hypothetical "remittance and migration free" Ukrainian economy of 2004. Rich urban households appear to win the most, while households with most of income coming as government transfers gain the least from remittances and remittance-induced effects. Noteworthy, in case of increase in supply of all types of labor (by 5 percent), rich urban households may gain an extra 8 percent (the most) in terms of overall consumption. This reflects the fact that households of this type possess the highest share of skilled, well-paid labor.

Georgia

Georgia, a country with a small-open economy and population of about 4.3 million people, has seen a significant outflow of emigrants and, at the same time, a large inflow of foreign currency in recent years. While available data only provide an incomplete picture, accumulated net migration since the mid-1990s exceeded 300,000 individuals (with some return migrants in 2005). Remittances through swift money transfer systems (Western Union etc.) amounted to more than USD 400 million in 2005, equivalent to 14 percent of GDP and slightly more than incoming FDI.¹

Our CGE model is based on the latest available national accounts data (2004). The social accounting matrix includes 13 production activities, which are aggregated from 18 sectors in the data source, generating domestic production of 12 commodities (agricultural goods are produced by large as well as small agricultural enterprises). There are 3 factors of production: labour, capital and self-employment. The transaction costs among households, enterprises and government originate in domestic sales, exports and imports. Further disaggregation of factors of production (including skilled vs. unskilled labour) as well as within the household sector depends on the availability of household-level data.

Five illustrative scenarios are set out in the attached table for Georgia. The macroeconomic impact of remittance inflows applied homogeneously across all sectors is strongest on the private household consumption and negligible on the GDP growth rate. Remittance inflows lead to higher domestic absorption, larger imports, lower exports and exchange rate depreciation. A combined effect of remittance inflows and emigration is negative with respect to all variables considered, with strong impact on exports (-15.8%), private household consumption (-12.3%) and GDP growth rates (-11%).

At the level of individual sectors, a simulated increase in remittance inflows causes manufacturing output to decrease the most, while household production increases somewhat by 1.4%. Other sectors gain negligibly, except the transportation and electricity sectors which lose about 0.5% and 0.8%, respectively. The combined effect

¹ Georgian-European Policy and Legal Advice Centre (GEPLAC): Georgian Economic Trends, Quarterly Economic Trends, October, 2006.

of remittance inflows and emigration is pronounced in all sectors, with the strongest negative impact on small agriculture where production falls by 32.8% due to large labour outflows. Only large agriculture and other primary sectors gain by about 10.7%.

Kyrgyzstan

Migration in the Kyrgyz republic has become very intensive since the collapse of the Soviet Union. Between 1990 and 2005, around 500,000 people left the country permanently. Many of these were Russian-speaking Kyrgyz citizens who left Kyrgyzstan for permanent residence in Russia and elsewhere. However, during the last five years, non-permanent labor migration has increased sharply, especially in rural areas with high unemployment. According to the local Kyrgyz embassies, about 300,000 individuals from Kyrgyzstan are currently working in Russia and around 100,000 in Kazakhstan. In 2006, workers remittances were around 473 million USD or 17% of GDP according to official data, while estimates of their true value ranged from USD 700 million to 1 billion (although these figures might include revenue from unofficial exports and credits).

Our social accounting matrix (SAM) for Kyrgyzstan is based on the national accounts for 2000-2004, input-output tables for 2003, and the household budget survey for 2003-2004. We were also able to draw on an existing SAM prepared for the World Bank by Mr. Miles Light for 2003 which we adjusted to the required format for the standard IFPRI model and extended by disaggregating the household sector for comparable analysis with the other countries in this workpackage. Specifically, the existing SAM has 91 sectors and households are divided into deciles for urban and rural areas. We aggregated up to 14 sectors and constructed representative household groups comparable with the groups used in Moldova's SAM, using data from the household budget survey.

Our household categories are (i) public employee households which draw more than half their income from public administration, health and social services; (ii) agricultural smallholders with more half of their total income from small-plot farming; (iii) pensioners with more than half their total income from state transfers; (iv) other rural households; (v) rich urban households (top 2 deciles by consumption); (vi) other urban households. Labour income is disaggregated into (i) low-skilled labour: head of household has general secondary or lower education; (ii) income from medium-skilled labor: head of household has special secondary or incomplete higher education; (iii) income from high-skilled labor: head of household has higher education; (iv) income from non-agricultural employment: household head is self-employed.

The GAMS program code for the Kyrgyz model as well as initial simulation scenarios have been developed using the example of Moldova supplied by the work package coordinator. Results of simulations are presented in the attached table for Kyrgyzstan.

Russia

International immigration seems to be the only solution to Russia's impending demographic crisis: if current trends continue, Russia's population will shrink by 20% to 112-119 million people in 2050. Moreover, the share of working age population

will decline substantially. This trend highlights, first, the role of internal immigration which can help overcome huge interregional imbalances and reallocate millions of workers from regions with low wages and high unemployment to the regions with zero unemployment.² Second, it is clear that the present policy framework for external immigration is counterproductive as it restricts much-needed immigration and creates illegal immigrants.

Russia is a net sender of remittances. There are different estimations of remittances out of Russia in 2004, ranging from an official figure of USD 2.1 billion (Central Bank of Russia) to USD 11.7 billion (Deloitte). According to the latter estimate, guest workers from CIS members accounted for over 40% of the total remittance market; also, unofficial transfers through friends and acquaintances, as well as with the help of conductors, and bus and courier service drivers, accounted for 40 percent of the total.³

Our social accounting matrix for Russia is based on the year 2004. It includes 22 sectors, one type of household, and two factors of production (labor and capital). Data on labor remittances is scarce and incomplete and has therefore not been included in the social accounting matrix at this stage. The illustrative simulations in the attached table are similar to the counterfactual experiments run for the Moldovan economy. The first illustrative simulation describes the impact of a 20 percent decline in total factor productivity (TFP), the second scenario simulates labor supply increase by 20 percent, and the third combines TFP reduction and labor supply increase. We plan to elaborate on the scenario design as the research advances.

Follow-up tasks

During the second phase of WP8, the first task will be to undertake more refined simulations with the comparative-static version of the CGE model. These will be both backward-looking, i.e. seeking to replicate key features of the macroeconomic development of our economics over the last 7 years or so, and forward-looking, i.e. developing scenarios of how migration and remittances might develop over the next several years and what the impact on the home country economies might be. We will also seek to refine the CGE model by endogenizing the domestic labor supply, taking into account research on the impact of migration and remittances on the labor supply of the household members remaining in the home country.

Secondly, overall, investment in most CIS countries has picked up only slowly, calling into question whether the recent economic recovery can be sustained. At the same time, some of the investment that did occur probably reflected strong demand in non-tradable sectors fueled by remittances. In order to capture such investment-driven growth, we will use an existing recursive-dynamic version of the IFPRI model to replicate investment growth on a year-to-year basis and identify the role of remittances in generating incentives for investment.

Third, where possible, macro-micro simulations will be employed to investigate the impact of changes in macroeconomic variables due to migration and remittances on household income, expenditures and welfare. Macro-micro simulations are based on household surveys and simulate the impact of changes in relative prices and other

² Andrienko, Y. and S. Guriev. 2005. *Understanding Migration in Russia*, CEFIR Policy Paper series
³ <http://www.banki.ru/news/engnews/?ID=95569>

relevant variables on every household in the sample. Thereby, it is possible to examine the distributional impact of migration and remittances in much greater details than in the CGE model with only a limited number of stylized types of households.

Deviations from the work programme

No major deviations from the work programme have occurred and the deliverable due to be completed at Month 12 (GAMS codes for CGE models for the countries in WP8) is included with this report in electronic format.

Data availability has been more difficult for Georgia and Russia than for other countries, particularly for household survey raw data that are necessary for disaggregating the household sector and labour income flows as much as we hope to do. We will continue to seek access to these data, or to alternative, more comprehensive data that will still allow us to disaggregate households and labour incomes in a meaningful way.

Deliverables for WP8

D16 (month 12): A comparative static CGE model for the studied economies; simulations of the growth and income distribution effects of changes in remittances:
INCLUDED WITH THIS REPORT

D17 (month 18): A recursive dynamic extension of the CGE model.

D18 (month 24): A research paper on the impact of out-migration and remittances from migrant workers on the CIS economies.

Moldova: Illustrative Simulation Results						
(base values and percentage changes in real terms)						
	Base run	TFP reduced by 20 pc (except in small-scale agriculture)	Remittances reduced by 70 percent	Labor supply increased by 20 pc (except high-skilled and non-agric. self- employed: 10 pc)	Remittances reduced and labor supply increased	TFP and remittances reduced, labor supply increased
Macro variables						
Domestic absorption	412	-13.8	-13.2	9.0	-4.1	-21.6
Private consumption	276	-20.6	-19.7	13.4	-6.1	-32.1
Fixed investment	67	0.0	0.0	0.0	0.0	0.0
Government consumption	52	0.0	0.0	0.0	0.0	0.0
Exports	155	-26.1	38.0	18.4	58.0	22.4
Imports	-246	-16.4	2.0	11.6	14.6	-7.8
GDP at market prices	320	-17.8	-0.2	11.6	11.6	-10.9
Real exchange rate	95	-4.1	4.8	-0.4	2.6	2.7
GDP at factor cost						
A_AGR_L	19	-42.0	-20.7	5.3	-14.7	-42.0
A_AGR_S	38	0.0	0.0	20.0	20.0	-4.0
A_FOOD	22	-24.2	-7.6	11.2	1.3	-21.8
A_LIGHT	6	-46.5	226.4	51.6	299.0	199.9
A_WOOD	4	-18.9	-2.1	7.9	4.6	-13.5
A_CHEM	7	-19.4	-2.2	9.7	6.7	-14.0
A_MASH	4	-19.7	0.1	7.9	5.8	-10.1
A_ELEC	7	-19.8	-6.9	11.8	4.4	-17.6
A_CONSTR	11	-4.0	-0.9	2.4	1.5	-3.3
A_TRADE	32	-19.3	2.2	12.1	14.2	-9.3
A_REST	3	-22.2	-6.4	12.5	5.1	-19.1
A_TRANS	19	-20.9	-2.3	11.4	8.5	-14.8
A_COMM	17	-21.8	-9.4	10.6	1.6	-22.9
A_FIN	33	-19.0	-6.7	10.8	4.3	-17.9
A_PUBLIC	14	-5.3	-4.4	3.4	-1.0	-7.5
A_PUB_SERV	35	-12.2	-9.6	7.9	-1.7	-16.6
TOTAL	271	-17.3	-0.1	11.7	11.9	-10.5
Household consumption (equivalent variation)						
HH_FARM	75	-16.7	-41.7	11.6	-31.9	-49.9
HH_O_RUR	69	-24.1	-9.4	15.9	7.7	-25.0
HH_O_URB	51	-23.9	-10.7	13.8	4.1	-26.2
HH_R_URB	28	-22.1	-9.9	14.9	6.2	-23.7
HH_PUB	17	-23.8	-17.7	14.9	-2.2	-32.3
HH_TRANS	35	-14.7	-14.9	10.0	-4.6	-23.3

Ukraine: Illustrative Simulation Results
(base values and percentage changes in real terms)

	Base run	TFP reduced by 10 pc (except in small-scale agriculture)	Remittances reduced by 70 percent	Labor supply increased by 5 pc	Remittances reduced and labor supply increased	TFP and remittances reduced, labor supply increased
Macro variables						
Domestic absorption	320	-10.2	-2.9	3.9	1.0	-10.5
Private consumption	186	-17.5	-5.0	6.7	1.7	-18.0
Fixed investment	77	0.0	0.0	0.0	0.0	0.0
Government consumption	61	0.0	0.0	0.0	0.0	0.0
Exports	211	-9.5	2.9	3.6	6.5	-4.0
Imports	-185	-10.9	-1.5	4.1	2.6	-9.2
GDP at market prices	345	-9.5	-0.2	3.6	3.5	-7.1
Real exchange rate	94.6	0.6	1.8	-0.3	1.4	2.3
GDP at factor cost						
A_AGR_L	26.6	-18.6	0.5	3.7	4.2	-9.7
A_AGR_S	24.3	0.0	0.0	5.0	5.0	-5.5
A_FOOD	12.3	-14.7	-3.5	5.6	2.1	-14.4
A_LIGHT	2.7	-21.3	-1.4	6.1	4.8	-16.9
A_WOOD	5.1	-10.8	-0.7	4.2	3.5	-8.3
A_CHEM	28.1	-9.3	3.0	3.7	6.7	-3.7
A_MASH	13.4	-6.3	3.0	2.2	5.1	-0.6
A_ELEC	12.6	-11.1	-0.5	4.3	3.8	-8.5
A_CONSTR	14.1	-0.7	-0.1	0.3	0.2	-0.6
A_TRADE	38.6	-11.2	-0.1	4.2	4.1	-8.3
A_REST	2.2	13.1	-0.9	4.9	3.9	-10.2
A_TRANS	29.8	-11.1	-0.5	3.8	4.3	-7.5
A_COMM	11.3	-13.9	-2.7	5.0	2.4	-12.8
A_FIN	42.8	-9.8	-0.3	3.6	3.3	-7.4
A_PUBLIC	14.8	-2.9	-0.2	1.2	0.9	-2.3
A_PUB_SERV	31.3	-5.3	-1.3	2.1	0.8	-5.2
TOTAL	310	-9.2	0.0	3.5	3.5	-6.8
Household consumption (equivalent variation)						
HH_O_RUR	40	-19.7	-6.3	7.4	1.1	-20.7
HH_O_URB	40	-18.3	-4.6	6.8	2.1	-18.2
HH_R_URB	20	-21.9	-4.9	8.4	3.5	-21.0
HH_PUB	20	-17.8	-6.5	6.6	0.1	-19.5
HH_TRANS	60	-13.5	-3.9	5.6	1.8	-13.8

	Georgia: Scenarios					
Aggregated macroeconomic variables	Base run	A decrease in TFP by 20%	Reduction in remittances by 70%	An increase in labor supply by 20%	A combined effect	
					(4)+(5)	(3)+(4)+(5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Level	change in real terms, %				
Domestic absorption	10.9	-4.2	-1.8	9.7	7.9	11.2
Private (household) consumption	7.0	-6.5	-2.7	15.1	12.3	-17.4
Fixed investment	2.4	0	0	0	0	0
Government consumption	1.3	0	0	0	0	0
Exports	3.0	-8.5	3.8	11.9	15.8	-8.0
Imports	-4.4	-3.4	-1.6	8.2	6.6	-9.7
GDP at market prices	9.5	-5.9	-0.1	11.1	11.0	-10.9
Real exchange rate (PPP)	96.1	-2.3	2.4	1.3	3.5	1.9
Disaggregated macroeconomic indicators						
Large agriculture and other primary sectors	0.6	4.9	-0.9	-9.9	-10.7	-32.9
Small agriculture	0.7	-16.1	-0.5	33.3	32.8	2.2
Manufacturing	0.6	-7.8	4.7	9.7	14.3	-4.9
Electricity	0.3	-7.3	0.8	12.9	13.7	-10.7
Processing of products by households	0.4	-6.6	-1.4	13.6	12.2	-15.2
Construction	0.7	-4.9	-1.5	10.6	9.2	-12.0
Trade and repair of moto vehicles	1.0	-6.1	-0.2	11.6	11.4	-11.3
Hotels and restaurants	0.2	-6.9	-0.3	13.4	13.1	-13.5
Transportation	0.8	-7.0	0.5	12.4	12.9	-12.9
Communication services	0.3	-6.7	-0.4	12.9	12.5	-13.0
Financial, professional, other private. services	0.7	-5.9	-0.3	11.4	11.2	-11.6
Public administration/ NGOs	0.9	-4.3	-0.5	9.0	8.5	-7.1
Public services and private households	0.9	-4.3	-0.2	8.5	8.3	-7.6
Total	8.3	-6.0	0	11.4	11.4	-10.8

Kyrgyzstan: Illustrative Simulation Results (base values and percentage changes in real terms)						
	Base run	TFP reduced by 20 pc (except in small-scale agriculture)	Remittances reduced by 70 percent	Labor supply increased by 20 pc (except high-skilled and non-agric. self- employed: 10 pc)	Remittances reduced and labor supply increased	TFP and remittances reduced, labor supply increased
Macro variables						
Domestic absorption	99402	-2.4	-4.5	7.1	2.5	-17.3
Private consumption	68956	-3.4	-6.5	10.2	3.6	-24.9
Fixed investment	16510	0.0	0.0	0.0	0.0	0.0
Government consumption	13936	0.0	0.0	0.0	0.0	0.0
Exports	30766	-12.1	11.9	8.2	20	-6.2
Imports	-38627	-2.9	-2.3	6.6	4.1	-16.7
GDP at market prices	91541	-5.4	0.1	7.7	7.7	-13.8
GDP at factor cost						
A_AGR	28094	-4.7	-2.8	9.5	6.5	-16.8
A_FOOD	1575	-4.1	-4.3	9.3	4.9	-18.8
A_LIGHT	281	-10	0.5	15.7	16.8	-12.7
A_WOOD	263	-13	5.2	16.1	22.6	-3.6
A_CHEM	8459	-11.5	15.2	5.2	19.8	-5.3
A_MASH	1265	-12.3	8.3	10.9	20.3	-5.3
A_ELEC	3576	-5.1	0.1	7.4	7.4	-14.2
A_CONSTR	2301	-1.4	0.1	1.8	1.9	-3.5
A_TRADE	12286	-3.9	-4.4	8.9	4.5	-21.4
A_REST	1217	-3.4	-5.1	9.2	3.9	-21.8
A_TRANS_COMM	4210	-8.7	1.6	10.2	12	-14.5
A_FIN	3161	-8.6	1.6	9.6	11.4	-14.1
A_PUBLIC	3839	-0.8	-0.1	1.2	1.1	-1.6
A_PUB_SERV	5692	-1.3	-1.3	2.9	1.5	-5.9
TOTAL	76219	-88.9	14.5	117.8	134.7	-159.6
Household consumption (equivalent variation)						
HH_FARM	7242	-1.5	-8.2	7.6	-0.8	-27.7
HH_O_RUR	19761	-5.6	-4.6	11.9	7.2	-25.0
HH_O_URB	11165	-2.9	-7.3	10.2	2.7	-27.0
HH_R_URB	12928	-4.8	-4.3	11.1	6.7	-22.5
HH_PUB	8866	-0.9	-7.3	7.8	0.5	-23.2
HH_TRANS	9091	-1.2	-10.6	9.8	-1.2	-24.7

Russia: Illustrative Simulation Results				
(base values and percentage changes in real terms)				
	Base run	TFP reduced by 20 pc	Labor supply increased by 20 pc	TFP reduced, labor supply increased
Macro variables				
Domestic absorption	129.7	97.5	140.5	107.3
Private consumption	61.1	28.9	71.9	38.7
Fixed investment	32.8	32.8	32.8	32.8
Government consumption	35.7	35.7	35.7	35.7
Exports	54.3	46.5	56.9	48.6
Imports	-29.1	-21.3	-31.6	-23.3
GDP at market prices	154.9	122.7	165.7	132.5
Real exchange rate	147.5	117.8	157.7	126.8
GDP at factor cost				
Electricity and heat	3.925	-22.1	9.1	-14.0
Products of Oil extraction and refinery	14.689	-4.2	-4.1	-13.7
Coal	0.614	-18.4	12.9	-6.7
Peat	0.013	-17.3	8.6	-9.4
Ferrous metals	4.1	-10.2	6.1	-4.3
Nonferrous metals	4.648	1.1	7.8	12.5
Products of Chemical industry and petrochemical industry	1.599	-21.8	10.6	-11.7
Machinery and equipment, metal works	6.575	-15.6	9.7	-6.7
Products of Forestry, wood-processing and paper-pulp industry	1.495	-26.8	17.7	-12.2
Construction materials (including glass, china and delftware)	0.995	-11.8	5.2	-7.0
Products of Light industry	0.496	-43.9	18.6	-28.4
Products of Food-processing Industry	3.931	-42.9	14.2	-29.7
Products of all Other industries	1.392	-25.3	9.8	-16.1
Construction goods	10.772	-4.1	1.9	-2.5
Agricultural goods and services in agriculture and forestry	7.198	-41.8	13.4	-28.8
Transport cargo and communication	12.309	-28.8	11.4	-19.1
Trade (including catering)	42.422	-32.8	9.5	-22.5
Other services	1.477	-25.3	10.7	-16.1
Housing	3.954	-30.2	12.2	-21.3
Health, sports, social security, education, culture and arts services	9.163	-6.2	2.9	-4.7
Science and scientific services, including geology and meteorology services	2.067	-4.6	2.8	-2.2
Finance, banking and insurance services, government and civil organizations	13.709	-3.3	1.5	-2.2
TOTAL	147.539	-19.8	7.4	-13.1
Household consumption				
(equivalent variation)				
Households	61.1	-52.6	17.7	-36.6