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Income and Distribution Effects of Migration and Remittances: an Analysis Based on CGE Models for Selected CIS Countries

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Abstract

This paper analyzes the direct and indirect income effects of international labor migration and remittances in selected CIS countries. The analysis is based on computable general equilibrium (CGE) models for Moldova, Ukraine, Georgia, Kyrgyzstan, and Russia. All net emigration countries would experience a sharp contraction of private consumption in the absence of remittances. In Russia, the main effect of immigration has been to hold down the real wage (as potential capital stock adjustments in response to immigration are not reflected in our comparative-static modeling framework). The paper concludes that because of the important contribution of migration and remittances to stabilizing and sustaining incomes in many CIS countries, enhanced opportunities for legal labor migration should figure prominently in any deepening of bilateral relations between CIS countries and the European Union under the European Neighborhood Policy.

1. Introduction and Overview

In many member countries of the Commonwealth of Independent States (CIS), international labor migration and remittances received by relatives at home now play a large role in financing private consumption and in shaping the labor supply and education decisions of households. Remittances received range from 8 percent of gross domestic product (GDP) in Ukraine to more than 30 percent in Moldova according to the latest internationally comparable estimates (see Section 2 for details).

At the same time, migration and remittances matter not only at the level of individual households. The large size of remittances suggests that they have probably affected output and income distribution not only directly at the level of remittance-receiving households, but also through general-equilibrium or indirect channels. For example, in many CIS countries, a large share of government revenues derives from taxes on imports (especially VAT), which grew rapidly as a result of growing remittance inflows. With higher revenues, governments were able to maintain and expand social transfers so that transfer-receiving households may have benefited indirectly from migration and remittances although they received no remittances of their own. Furthermore, the growth of remittances since approximately the year 2000 has coincided in most CIS countries with the recovery of GDP from its transition-induced precipitous fall during the 1990s. This coincidence of remittances and GDP growth raises the question of how labor migration and remittances may have contributed to the economic recovery in most CIS countries since 2000.

This paper presents case studies for several CIS countries that seek to assess the indirect effects of labor migration and remittances on income distribution and structural change systematically. The case studies are based on single country computable general equilibrium (CGE) models. While the direct impact of migration and remittances at the household level has been studied through household-level analyses in many countries, much less work has been done on indirect (or general equilibrium) effects. The case studies cover several net emigration countries – Moldova, Ukraine, Georgia, and Kyrgyzstan – as well as Russia, which has recently experienced both emigration and immigration.

Section 2 describes the overall macroeconomic context in which the sharp increase in labor migration and remittances since approximately the year 2000 oc-

curred. In terms of the main categories of macroeconomic demand, household final consumption has grown more strongly than GDP since 2000 in the five sample countries. By contrast, the evolution of government consumption was rather diverse. Fixed capital formation only began to grow with a lag of several years after the pickup in GDP in most countries, although the transition-induced fall had reduced fixed investment to a level insufficient to prevent a gradual depletion of the existing capital stock. This overall picture is consistent with a view of GDP growth as initially driven from the demand side, with households' disposable incomes growing because of remittances, a subsequent real appreciation and expansion of non-tradable sectors, and a late response from investment.

Section 3 presents the case studies on net emigration countries. Section 3.1 contains a brief technical description of the standard IFPRI CGE model that is used in all country studies. Section 3.2 describes the case study for Moldova where the best available estimates suggest that remittances reached one third of GDP in 2006 while the number of migrants abroad amounted to about one quarter of the working population (including migrants). These estimates count only those migrants who are still part of a household in Moldova (i.e. contribute to household income and share in expenditures); remittances may include transfers from individuals who have left Moldova permanently. Labor migration from Moldova is remarkable in that poorer households are more likely to send a migrant abroad than richer ones, contrary to the situation in many other countries where barriers to emigration are more difficult to overcome for poor, credit-constrained households. In the case of Moldova, the poor and low-skilled have the option of taking up employment in Russia, where travel is visa-free and cheap, although working conditions and wages are often poor. By contrast, the EU (especially Italy and Portugal) would be preferred as a host country by many migrants because of better pay and conditions, but high up-front costs for illegal travel make this a difficult proposition for many poor households.

Our simulation results suggest all household groups in Moldova would lose substantially in the absence of migration and remittances. In relative terms, the losses would be largest for small farmers because (i) migration, including for seasonal work, is very widespread in the countryside, and (ii) higher disposable incomes in the population at large are strengthening demand for local food products. As expected, private consumption would be one third lower, with a smaller reduction in GDP of approximately one tenth. The only sector that would gain significantly is light industry, mostly through much higher exports; this simulation result is in line with a conventional Dutch disease effect.

In Ukraine (Section 3.3), remittances are rather smaller in relation to GDP than in the three smaller CIS countries with net emigration. Plausible estimates put remittances in the order of one tenth of GDP and the number of labor migrants

substantially below one tenth of the labor force. Still, our CGE-based simulations reveal quite notable effects of migration and remittances. For example, the country's hypothetical economy would have lost up to 7% of its potential without migration and remittance-induced effects. All types of households benefit from remittances substantially: their overall consumption would have been lower by 14 to 21 percent in the hypothetical "migration and remittance free" economy. Rich urban households are set to win the most, while households with income coming mostly in form of government transfers gain the least from remittances and their economy-wide effects. On production side, light and food industry are the key beneficiaries of remittance-driven demand effects. On the other hand, local machinery, construction and public administration sectors appear to be quite remittance-neutral.

In Georgia (Section 3.4), labor migration apparently started earlier than elsewhere in the region, with substantial remittances already in the mid-1990s. While the varying estimates are difficult to reconcile, remittances were probably below one fifth of GDP. The number of labor migrants is estimated at less than one million; even if many of these are in fact long-term emigrants, their number is large relative to an economically active population in Georgia of approximately 2 million. Labor migration and remittance inflows have a strong macroeconomic growth effect at the aggregated level; however, not all sectors and residents are affected symmetrically. The positive effect of remittances is pronounced in manufacturing, large-scale agriculture, construction, and service sectors concentrated mostly in the urban areas of the country. The impact on the production of household farmers (or small agriculture) depends on the geographical location and identity of households. In distant regions with high transaction costs, for example, farm production increases substantially, while in regions with lower transaction cost farm production decreases once farmers have access to remittance incomes. As a result, remittances have a rather limited overall impact on poverty reduction and income inequality, especially in rural areas. Their impact on consumption is smallest for the group of poor and middle-income rural households and largest for urban households with higher incomes. Consequently, the wealthier members of the society gain from remittances more than poorer household categories. Better access to labor markets, on the contrary, would improve the welfare states of many, especially, of the rural poor at the outset.

These simulation results for Georgia suggest that government and donor policies should prioritize a pro-poor approach in improving institutions within the country, especially by improving access to labor and credit markets. With the focus on the inclusion of the rural poor in the financial sector, for example, policies could be designed for meeting the production needs of farmers in distant regions. This would include opportunities to link remittance flows with family-based mi-

crofinance mechanisms focused on promoting saving, insurance and investment within a given region, as well as decreasing transaction costs across regions.

In Kyrgyzstan (Section 3.5) remittances also play a very important role in the economy; by official estimates for 2007, remittances exceeded one quarter of the country's GDP. The number of labor migrants is estimated at 15-20% of total labor force in the country; their main destination countries are Russia and Kazakhstan. Kyrgyz labor migrants represent all segments of the society, but majority of them originate from labor abundant and land scarce rural areas and small towns in the southern part of the country. While wealthier households receive more remittances than poor ones because of better education and access to information, the role of remittances is larger for poor households. Private consumption and government revenues (through taxation of remittance-driven imports) depend substantially on remittances. In the absence of migration, all types of households would be worse off, with considerable losses for GDP, private and government consumption.

The situation in Russia (Section 4) mirrors in some way the emigration countries as Russia is the predominant destination for labor migrants within the CIS. Inward labor migration has come to play a significant role in the Russian economy. The data situation is less than satisfactory as Russian official statistics usually quote migration flows, while the World Bank estimates the stock of immigrants, rendering comparisons difficult. Thus official sources put the number of immigrants arriving to Russia in 2006 at less than 200,000 individuals, mostly from CIS countries. By contrast, the total immigrant population is estimated by the WB at 12 million individuals in 2005. Remittances make up only a small part of Russian outward capital flows, with estimates ranging from US$ 6 billion (Central Bank of Russia) to US$ 12 billion (World Bank) US$.

Our CGE-model-based simulations are designed to assess the direct and indirect effects of migration on the sectoral structure of the Russian economy. An increase in labor migration increases the supply of labor for all industries, pushes wages down, and raises rent (capital income). The fall in the wage rate drives domestic prices down and stimulates exports. The price ratio of tradables to nontradables increases, along with the real and nominal exchange rates, all implying a real depreciation of the Russian currency. Both the direct and the indirect effects work in the same direction, with the indirect effects dominating.

Section 5 concludes that, while these country case studies do not analyze specific policy measures, they demonstrate large potential benefits from labor migration and remittances for migrants' home countries. These potential benefits, as well as the attending risks, depend in important ways on government policies related to migration in both, home and host countries. Against the backdrop of the

migration-related policies currently pursued in the CIS region and in the EU, three major policy implications emerge.

First, some CIS country governments faced with large migrant outflows have been reluctant, for political reasons, to even acknowledge that emigration is taking place on a large scale. Consequently, they have failed to provide support services, such as effective consular support, job placement through recognized agencies, or advocacy for more legal migration opportunities with host country government. By providing such services, sending country governments would help to limit the risks faced by migrants and enhance the benefits of migration to migrants and their families as well as sending country economies overall.

Second, for economic recovery to take hold in the smaller, natural-resource-poor CIS countries, fixed investments need to be sustained and increased further. Remittances could help to pay for such investment. However, the business and investment climate in many of these countries is so poor that, currently, remittances are only rarely used for productive investment. Government efforts to channel remittances into investment, which are debated in many CIS countries, will succeed only when all investors can expect to receive an adequate return on productive investments that is not diminished by parasitic public institutions.

Third, destination countries will increasingly find themselves competing not only for high-skilled migrants, but also for those willing to perform jobs that are otherwise difficult to fill (such as seasonal work in agriculture, construction, and social services). Russia, the most important host country for migrants from the CIS region, is currently offering legal employment on a fairly broad basis, even though the number work permits has recently been cut because of the effects of the financial crisis. By contrast, legal employment opportunities in the European Union are still limited, although legalization programs such as in Italy and Portugal will soon create pockets of legal migrants that will become the hubs of future migrant networks. As these networks will attract more family-based and other immigration from CIS countries in the future, it would be in the interest of both migrants and EU host countries to replace haphazard legalizations with a forward-looking strategy for admitting migrants with good job prospects in the EU. Since the EU functions as a single labor market, such programs should be coordinated at the EU rather than the national level. For the benefit of both, CIS countries and the EU, the deepening of bilateral relations under European Neighborhood Policy should include enhanced opportunities for legal labor migration.

2. The Macroeconomic Context

The stylized facts of macroeconomic development in the CIS countries during the last two decades are fairly straightforward. After the disintegration of the former Soviet Union in 1991, GDP fell sharply in all five countries covered by this study (Figure 2.1; all data in Figures 2.1 through 2.4 are from the World Bank's Word Development Indicators Database). This precipitous fall was followed by prolonged stagnation at a low level during the second half of the 1990s, with some further losses as a result of the Russian financial crisis in 1998. A sustained recovery began around 2000 in most countries and still continues as of mid-2008. While total output is still below its pre-independence level in most CIS countries, household final consumption expenditures have recovered much better (Figure 2.2); in several countries, they had regained or even surpassed their 1990 levels by 2006. By contrast, fixed investment recovered much more slowly (Figure 2.3) and the picture for government final consumption is rather mixed across the CIS countries covered by this study (Figure 2.4).

Figure 2.1. Total GDP, 1990 to 2006
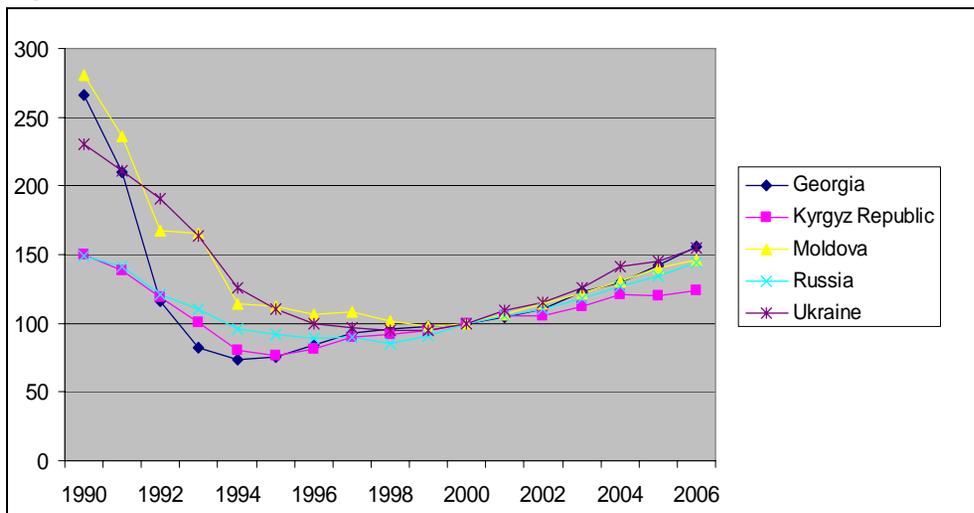
Note. Year 2000 set as 100.

Figure 2.2. Household final consumption expenditures, 1990 to 2006
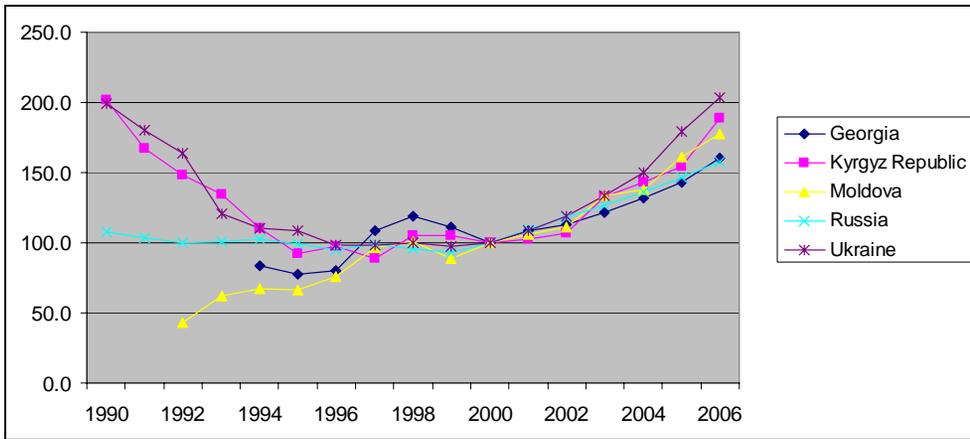
Note. Year 2000 set as 100.

Figure 2.3. Gross fixed capital formation, 1990 to 2006
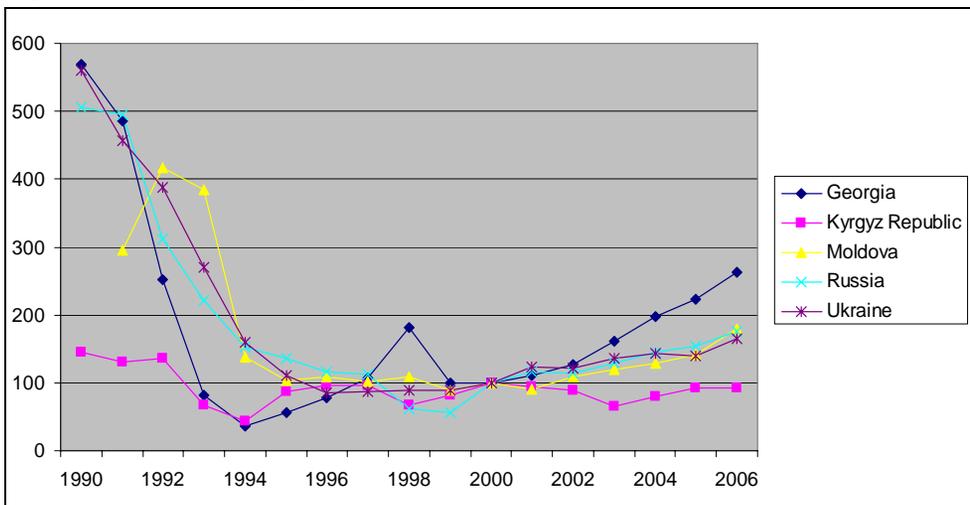
Note. Year 2000 set as 100.

The driving forces behind this development are somewhat less clear. Indeed, they have been the subject of contentious debates that evolved considerably as events unfolded. The post-independence output collapse is probably explained largely by the rapid collapse of institutions that regulated trade during the Soviet period, while initially the necessary institutional infrastructure for market-based economic relations (functioning currencies, hard budget constraints, enforceable contracts) did not exist. An additional role was played by the sharp reductions in government procurement, which particularly affected the military industrial complex.

Figure 2..4. General government final consumption, 1990 to 2006
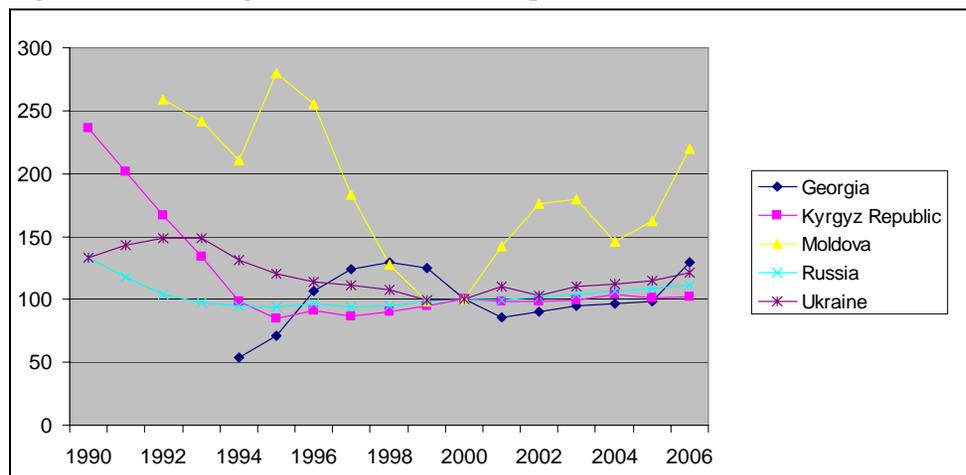
Note. Year 2000 set as 100.

The gradual emergence of market-enabling institutions helps to explain why trade among the CIS countries, along with output, stabilized during the mid-1990s. However, observers continued to note many persistent shortcomings regarding corporate governance, the business climate, and the investment environment. Therefore, the sustained recovery since 2000 is more difficult to explain. Indeed, investment appears to have lagged, rather than led, the output recovery. One factor that has clearly played a role in the recovery is the resurgence of Russian import demand for CIS products on the heels of rising world market prices for energy materials since the late 1990s. Higher Russian import demand would have led to higher exports by the other CIS countries and higher rates of capacity utilization. Another factor that contributed to the recovery has been the growing demand for non-tradable goods and services (a Dutch-disease-style effect) throughout the region. It resulted from rising oil and gas revenues in the case of Russia and from sharply rising migrant remittances since the late 1990s in the remaining countries (Figure 2.5).

The available time-series data on migrant remittances are based on balance of payments statistics (as compiled by the International Monetary Fund in its Balance of Payments Statistics Database), representing the sum of credit items from compensation of employees (income account) and workers' remittances (transfer account). Data quality varies widely across countries, especially with respect to whether they include estimates of cash transfers through informal channels in addition to transfers through the banking system and money transfer operators. For every country, however, there is a substantial increase in migrant remittances from

about 2000. The picture for Georgia is more nuanced in that there were substantial remittances as early as the mid-1990s; notably, Georgia's GDP also began to re-cover at that time, earlier than elsewhere in the region. The 2007 data point for Ukraine clearly represents a break in the underlying time series; indeed, the low level of remittances suggested by the pre-2007 estimates is not plausible, given Ukraine's large migrant population abroad.

Figure 2.5. Migration remittances, 1997 to 2007 (million US$)
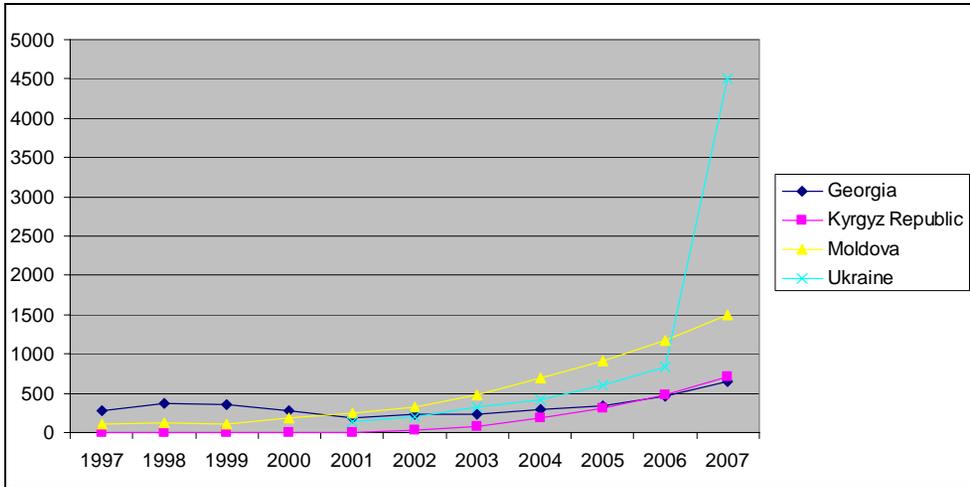
Figure 2.6. Russia: Migrant remittances credit and debit, 2001 to 2007 (billion US$)
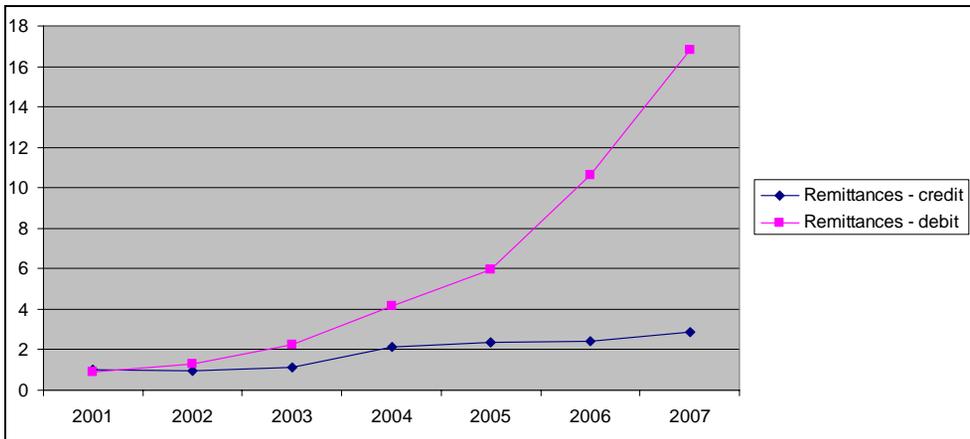
Balance of payments data for Russia, which hosts most labor migrants from CIS countries, represent the mirror image of these developments. Remittances by incoming migrants ("debit" items) rose to almost US$ 17 billion in 2007 from

around US$ 1 billion in 2001 (Figure 2.6). Remittances received by Russian expatriates also increased, but remained below US$ 3 billion in 2007.

While balance of payments statistics provide at least a starting point for assessing the evolution of migrant remittances over time and across countries, the data situation with respect to the number of labor migrants is even more problematic. Official data on population movements are often not helpful because a large proportion of labor migration occurs illegally. Furthermore, labor migration occurs in many different settings, ranging from seasonal movements to immigrants becoming citizens of the host country. Standard definitions of migrant status based on foreign birth or foreign citizenship may therefore lead to very different estimates. Furthermore, these estimates may be difficult to interpret when a country like the Soviet Union, where internal migration was extensive, is split up into several countries while new national identities and allegiances are only evolving.

A comprehensive country-by-country matrix of the number of foreign-born residents has recently been compiled by the World Bank; the IFAD remittances database uses these migrant numbers to estimate migrant remittances in 2006 (Table 2.1). Although both data sets are subject to many uncertainties, they represent the best combined estimates of labor migration and remittances available across a wide range of countries, drawing on a wide variety of national data sources. For the countries covered by this study, remittances are estimated at close to one third of GDP in Kyrgyzstan and Moldova, and at about one fifth in Georgia. Although much larger in absolute terms, remittances in Ukraine amount to less than one tenth of GDP. In Russia, remittances received from emigrants are small by comparison at less than 2% of GDP.

The large number of emigrants estimated for Russia and Ukraine reflects in part large groups of ethnic Russian- and Ukrainian-born residents in other countries of the Former Soviet Union, rather than recent labor migrants to richer countries. Many of these individuals have probably resided there since before the disintegration of the Soviet Union in 1991; their motivations for staying or leaving in their host countries are therefore bound to be rather different from recent labor migrants motivated by higher potential incomes abroad. Accordingly, also, the remittances received by Russian and Ukrainian as reported in Table 2.1 are likely to be overestimated somewhat.

Overall, this brief review of macroeconomic developments and remittances in the CIS countries covered by this study suggests that, other than in Russia, remittances have sustained private consumption and contributed to the resumption of GDP growth since 2000. Migration and remittances are large enough not only to improve the welfare of remittance-receiving households, but also to affect macroeconomic variables such as the real exchange rate and wage levels and thus alter

the sectoral structure of the economies, thereby generating further indirect effects on the welfare of all households, whether or not they receive remittances. These effects will be analyzed further in Sections 3 and 4 below through simulations based on computable general equilibrium (CGE) models for the selected CIS countries.

Table 2.1. Selected CIS Countries: Migrants and Remittances, 2006

	Remittances		Migrants (thousand)
	US$ million	**percent of GDP**	
Georgia	1,525	20.2	1036
Kyrgyzstan	846	31.4	597
Moldova	1,027	31.4	663
Ukraine	8,471	8.0	5878
Russia: immigrants	n.a.	n.a.	11977
Russia: emigrants	13,794	1.4	12099

Source: IFAD remittances database http://www.ifad.org/events/remittances/maps/brochure.pdf; http://www.migrationdrc.org/research/typesofmigration/global_migrant_origin_database.html.

3. Country Studies: Net Emigration Countries

The following sub-sections present country studies on the effects of migration and remittances in selected CIS countries that experienced net emigration of workers: Moldova, Ukraine, Georgia, and Kyrgyzstan. Each country study involves the application of a standard single-country computable general equilibrium (CGE) model to a social accounting matrix that was developed under the ENEPO project. The underlying CGE model is the well-documented IFPRI (International Food Policy Research Institute) standard model (Lofgren et al. 2002) which has been widely applied to developing countries. Its straightforward basic structure with a choice of standard neoclassical and neo-structuralist assumptions, its user-friendly and well-documented code (in GAMS software), and its easy adaptability to national circumstances (different levels of aggregation for households, the agricultural sector, etc.) render it well-suited for the present analysis.

We also explored the feasibility of using a recursive-dynamic version of the IFPRI standard CGE model to complement our comparative-static simulations. A more explicitly dynamic structure would reflect the investment process more accurately and thereby provide additional insights into the growth effects of remittances. However, the additional assumptions required to implement a recursive-dynamic model turned out to be far-reaching. Overall, we would have introduced a high level of arbitrariness into the analysis such that the more detailed description of the investment process in the recursive-dynamic model would ultimately have been meaningless.

In constructing the social accounting matrices, we combine input output tables, other national accounts information, household budget surveys, labor force statistics, and fiscal statistics, among other data sources. A key difficulty is that official data tend to understate migration and remittances in some countries because a large proportion of remittances are transferred as foreign exchange cash and much migrant employment is informal. For the databases to reflect realistic orders of magnitude, various data sources are drawn upon and appropriate adjustments made. The level of aggregation (number of commodities, sectors, factors of production, and household types) differs slightly across the country studies.

The following section summarizes some key features of the IFRPI standard CGE model. Each of the subsequent country studies starts with a discussion of the data situation and goes on to report simulation results that seek to answer the question of what each economy would look like without migration and remittances. These effects are disaggregated by household type and followed through the economy.

3.1. Overview over the IFPRI standard CGE model[1]

In general, computable general equilibrium (CGE) models are used to analyze the effects of policy changes and other shocks (such as an opening to labor migration) throughout the economy. CGE models may be viewed as an extension of multi-sector input-output and fixed price models and incorporate the indirect effects and price effects of policies. They apply to the time period it takes for an economy to move from one equilibrium to another, in response to a policy change or other shock. In this sense, a static CGE model as used in the following country studies generates a medium-term solution - a situation where the initial disequilibrium after the shock has disappeared, but before dynamic effects (such as additional investment or disinvestment) set in.

The database for a CGE model is the social accounting matrix (SAM) for a given year, a square matrix that describes all commodity and monetary flows among the economic agents in an economy at a suitable level of aggregation (production sectors, households, enterprises, government, the "rest of the world"). Depending on the chosen level of aggregation, the SAM combines information from input-output accounts, national income and product accounts, household budget surveys, labor force statistics, and fiscal statistics, among other data sources. Although the case studies in this paper are all based on single-country CGE models, CGE models are also implemented for several countries simultaneously or for the global economy disaggregated by regions and countries, requiring multi-country SAMs.

Naturally, simulation results based on CGE models depend heavily on assumptions about functional forms (such as Leontief vs. CES production functions), underlying parameters (such as substitution elasticities in production and demand functions), and macroeconomic balancing mechanisms. Traditional neoclassical CGE models are based on Walrasian general equilibrium theory: Firms maximize profits, and wages and prices adjust to equate supply and demand in factor and

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[1] This section draws extensively on Fagernäs (2004).

product markets, with factors of production fully employed. By contrast, models in the structuralist tradition use different assumptions about macroeconomic balancing mechanisms and the way markets clear, incorporating features of short-run macroeconomic models with wage or price rigidities and unemployment. Many CGE models (including in this paper) are real side models without asset markets and with neutral money[2].

The IFPRI standard CGE model on which our case studies are based allows for a range of alternative assumptions that reflect both the structuralist and the neoclassical tradition. It is a real-side model without explicitly modeled asset markets or inflation[3]. Production is carried out under perfect competition by sectors ("activities") that maximize their profits, subject to a multi-level production function and given the prices of their inputs, outputs and factors. Within each activity, the top level of the production function consists of a Leontief function that combines an aggregate of the factors of production (value-added) on the one hand and intermediate inputs on the other hand. Factors of production (high-skilled workers, low-skilled workers, capital, etc.) are combined according to a constant elasticity of substitution (CES) function, while the various intermediate inputs are used in fixed proportions (Leontief function).

Domestic output of a given good (say, food) may be produced by different sectors (say, small farms and commercial agriculture). Aggregate domestic output is allocated to exports and domestic sales based on profit maximization with given prices, a given quantity of total output and imperfect transformability between domestic sales and exports in line with a constant elasticity of transformation (CET) function. Export supply is therefore determined by the domestic price of exports relative to domestic sales, where the domestic price of exports is the given world price of exports adjusted by export taxes and the exchange rate. Thus the model assumes a small, open (i.e. price-taking) economy.

Domestic demand for a given good is the sum of demand for private (household) consumption, government consumption, investment, and intermediate inputs. If a commodity is imported, domestic demand is for a composite commodity of imports and domestically produced goods, with the optimal mix determined through cost minimisation via a CES aggregation function. This so-called Armington assumption allows for some decoupling of domestic from world market prices and ensures that simulated export and import responses to policy changes will be broadly realistic. The supply of imports is infinitely elastic at given world prices.

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[2] For an overview over the main CGE modeling approaches with references to appropriate literature, see Robinson (2003).
[3] For a detailed description of the IFPRI standard model see Lofgren et al. (2002).

The domestic price of imports is the given world price adjusted by the exchange rate and tariffs.

Households receive income from factors of production supplied to production activities (e.g. labor) and transfers from institutions, particularly the government and other households. Households save, consume, and pay direct taxes and transfers; direct tax rates and the propensity to save are determined by the chosen closure rules for the government and savings-investment balances (see below). Household consumption is allocated across different products according to a linear expenditure system (LES), which implies in this case that the consumption of individual commodities is a linear function of total household consumption expenditure. Household types may differ in their demand elasticities and consumption shares for each commodity.

The macro closure rules for the CGE model define the mechanisms by which the three macroeconomic balances are determined: (i) the current government balance; (ii) the current account balance, and (iii) the savings and investment balance. First, the government receives its income from taxes and transfers from the rest of the world and decides on the level of current spending (government consumption plus transfers to households) vs. government saving. The IFPRI standard model allows us to choose between two basic closure rules for the government balance. Either direct tax rates are fixed, but government saving (the real fiscal balance) adjusts in response to changes in government revenue; or direct tax rates adjust to maintain a given level of government saving.

Second, the savings-investment balance states that total investment is the sum of private investment, government investment, and foreign savings. In this static model (comparative-static with simulation exercises), investment is not driven by the rate of return on capital but by the availability of savings. The standard IFPRI model allows for two basic approaches: (i) private savings are investment-driven such that the marginal propensity to save adjusts to a given level of investment; (ii) investment adjusts to the level of savings, given a fixed marginal propensity to save.

Third, foreign savings are equivalent to the current account deficit and hence define the external balance (i.e. the balance of inflows and outflows of foreign exchange). Transfers between the rest of the world and domestic institutions and factors (including migrant remittances) are exogenous to the model and given in foreign currency. Thus the current account balance is driven by the balance of exports and imports. The alternative closure rules in the standard IFPRI model leave either the real exchange rate or the current account balance constant, requiring the other variable to adjust.

Factor market closures determine the mechanisms that equilibrate the supply and demand of each factor of production. In line with general equilibrium theory, each activity uses a set of factors up to the point where the marginal revenue product of each factor equals its wage. There are two wage variables: the economy-wide wage, and an activity-specific wage that is the product of the economy-wide wage and an activity specific wage or distortion term. There are basically three possible closure rules: (i) a factor is fully employed and mobile, giving rise to a uniform economy-wide wage; (ii) a factor is fully employed and immobile, giving rise to sector-specific wage rates; or (iii) a factor is mobile but may be unemployed, allowing the wage to be set as a policy parameter.

3.2. Moldova[4]

Migration and remittances play a key role in the Moldovan economy, with approximately 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. These estimates count only those migrants who are still part of a household in Moldova (i.e. contribute to household income and share in expenditures); remittances may include transfers from individuals who have left Moldova permanently.

Labor migration from Moldova is remarkable in that poorer households are more likely to send a migrant abroad than richer ones, contrary to the situation in many other countries where barriers to emigration are more difficult to overcome for poor, credit-constrained households. In the case of Moldova, the poor and low-skilled have the option of taking up employment in Russia, where travel is visa-free and cheap, although working conditions and wages are often poor. By contrast, the EU (especially Italy and Portugal) would be preferred as a host country by many migrants because of better pay and conditions, but high up-front costs for illegal travel make this a difficult proposition for many poor households.

Our social accounting matrix is based on the year 2004; available data include the national accounts through 2004, including 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,

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[4] Authors of this section: Matthias Luecke and Toman Omar Mahmoud.

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 agricultural sector is subdivided into small-scale (household) agriculture and agricultural enterprises.

Our simulations seek to describe what the Moldovan economy would have looked like in 2004 without labor migration and remittances. The first simulation hypothetically eliminates the recent strong growth in total factor productivity (TFP). That TFP growth is apparent from the fact that GDP grew by about one third from 2000 through 2004, while fixed investment remained modest and the labor force declined. In part, TFP growth may have been a natural result of the recovery from the transition-induced crisis, for example due to the emergence of market-supporting institutions as systemic transformation takes hold. To this extent, TFP growth might have occurred even in the absence of migration. However, we consider it plausible that most of the apparent TFP growth results from higher utilization rates for existing production capacity that arose as a consequence of remittances-induced demand growth.

The second and third simulations 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 a larger labor supply, and the fifth simulation adds lower TFP. It turns out (Table 3.1) that the combined effects under the fourth scenario are very similar to the sum of the separate effects under the second and third scenario; similarly, the combined effects for all simulated shocks under the fifth scenario are very similar to the sum of the separate effects under the first, second, and third scenario. Therefore, in discussing the results, we focus on the fifth scenario.

Table 3.1. Moldova: Simulation Results (base values and percentage changes in real terms)

	Base run	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Macro variables						
Domestic absoprtion	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

	Base run	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
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_SMALL_FARM	75	-16.7	-41.7	11.6	-31.9	-49.9
HH_OTH_RUR	69	-24.1	-9.4	15.9	7.7	-25.0
HH_OTH_URB	51	-23.9	-10.7	13.8	4.1	-26.2
HH_RICH_URB	28	-22.1	-9.9	14.9	6.2	-23.7
HH_PUBLIC_SECTOR	17	-23.8	-17.7	14.9	-2.2	-32.3
HH_TRANSFER	35	-14.7	-14.9	10.0	-4.6	-23.3

Note. Scenario 1 – TFP reduced by 20 pc (except in small-scale agriculture). Scenario 2 – Remittances reduced by 70 pc. Scenario 3 – Labor supply increased by 20 pc (except high-skilled and non-agriculture self-employed: 10 pc). Scenario 4 – Remittances reduced and labor supply increased. Scenario 5 – TFP and remittances reduced, labor supply increased.

Our simulation results suggest that household consumption would be reduced sharply in the absence of migration and remittances. This applies both to total consumption, which would fall by 32.1 percent, and to every household group. In relative terms, the losses would be largest for small farmers (with consumption cut in half) because (i) migration, including for seasonal work, is very widespread in the countryside, and (ii) higher disposable incomes in the population at large are strengthening demand for local food products.

GDP would fall by approximately one tenth under the fifth scenario and thus by much less than private consumption. A comparison of the GDP effects under the first, third, and fifth scenario demonstrates that GDP would decline mainly because we assume that without migration, total factor productivity (TFP) would not improve as much as it actually did. As discussed above, total factor productiv-

ity should be thought of in this context as predominantly reflecting higher rates of capacity utilization, rather than technological change. The positive output effect of migrant workers returning home and adding to the local labor force (under the third scenario) would be insufficient to compensate for the fall in TFP.

Without migration and remittances and the associated TFP growth, the Moldovan currency would depreciate in real terms, adjusting to lower foreign exchange inflows as remittances are reduced. Our closure rules for these simulations imply that foreign savings, investment, and government consumption are exogenous. While foreign savings are adjusted to reflect lower migrant remittances under the second, fourth and fifth scenario, investment and government consumption remain constant in real terms relative to the base run.

The only sector whose output would grow significantly in the absence of migration and remittances is light industry, whose exports would also increase sharply. This simulation result is in line with a conventional Dutch disease effect as a result of the inflow of foreign currency through remittances. It is interesting to compare these simulation results with recent sectoral changes in the Moldovan Economy. Textile and clothing exports from Moldova to the European Union have in fact expanded substantially since 2007 even though migration and remittances have grown and the Moldovan currency has appreciated further since 2004. These recent developments suggest that barriers to trade, rather than high and rising production costs because of a Dutch-disease-style real appreciation, impeded the expansion of the Moldovan textile and clothing sector in the past. With Romania's accession to the European Union, Moldova became a direct EU neighbor, separated by only one border from the European single market; it appears that the resulting reduction in informal trade barriers was sufficient to set off the recent wave of foreign direct investment and output and export growth in the textile and clothing industry.

3.3. Ukraine [5]

3.3.1. Migration data

According to several alternative studies, the overall stock of Ukrainian labor migrants working abroad during the late 1990s and early 2000s ranged from 0.8 to

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[5] Author of this section: Vitaliy Vavryshchuk

2 million persons. The latest ILO survey reveals about 780,000 Ukrainian labor migrants in other countries (about 3.5 - 4% of total labor force) (IOM 2006). These numbers contrast sharply with much lower official data on employment permits for Ukrainians working abroad (only 61,400 permits were granted by resident employment intermediaries in 2006). Of these, more than two thirds are typically for EU countries, especially Cyprus, Greece, and the UK.

The latest full-fledged research of labor migration trends in Ukraine was completed in 2001 when the State Statistics Committee conducted a survey of 18,000 households in 8 regions (oblasts). The number of labor emigrants in the selected 8 oblasts was estimated at 380,000 persons. Extrapolation to the whole country gives about 800,000 labor migrants. According to the survey about 60% of all migrants were employed in countries which are currently the members of the enlarged EU. The most attractive destinations for Ukrainians at that time were Poland (hosting about 18% of Ukrainian labor migrants), Czech Republic (17%), Italy (8.5%), and Portugal (3.8%) (Poznyak 2002).

Another survey of Ukrainian households in eight Western regions of Ukraine in 2005 indicates that ranking of most popular destinations among Ukrainian migrants changed somewhat. Italy topped the list of most desired destinations with 60% of votes, followed by Portugal (31%), Spain (24%), and Poland (23%). Out of ten most frequently mentioned countries, seven were the EU member states (Starodub & Parkhomenko 2005).

The true scale of Ukrainian labor migrants' presence in some European countries was revealed during regularization programs. In 2002 the Italian government ran a two-month regularization program for housemaids and contract workers. Out of 341,000 of applications from housemaids, 27% were submitted by Ukrainians. During the regularization program in Portugal running from January 2001 till March 2003, more than 62,000 temporary work permits (out of a total of 180,000) were granted to Ukrainians (Poznyak 2006).

The share of Ukrainian labor emigrants coming from small cities is estimated at 42% while villagers account for about 29% and people from big cities make 25% of total number of labor migrants. Migrants from the capital accounted for just 3.0% of overall migrants stock abroad while Kyiv population exceeds 6.5% of the country population. In terms of professional structure most of Ukrainian men working abroad are construction or agricultural workers. At the same time, most of women choose to be employed as housemaids.

3.3.2. Remittances data

Statistics on migrants' remittances in Ukraine are fragmentary and data from different sources difficult to reconcile. According to WB study, migrants' remittances to Ukraine and Moldova (the countries are treated as one sub-region in the study) totaled some USD 0.44bn (Mansoor & Quillin 2006)[6]. Although the absolute numbers on remittances seem to be strongly underestimated under the WB's approach, the geographical distribution of remittance inflow is worth attention. About 50% of remittances to the region come from EU-15 countries, while 37% originated from Russia and other CIS resource-rich countries. Another 5% are attributed to remittances from new EU member states.

Figure 3.1. Migrants' remittance to Ukraine in 2003-07 by BoP categories (USD billion)
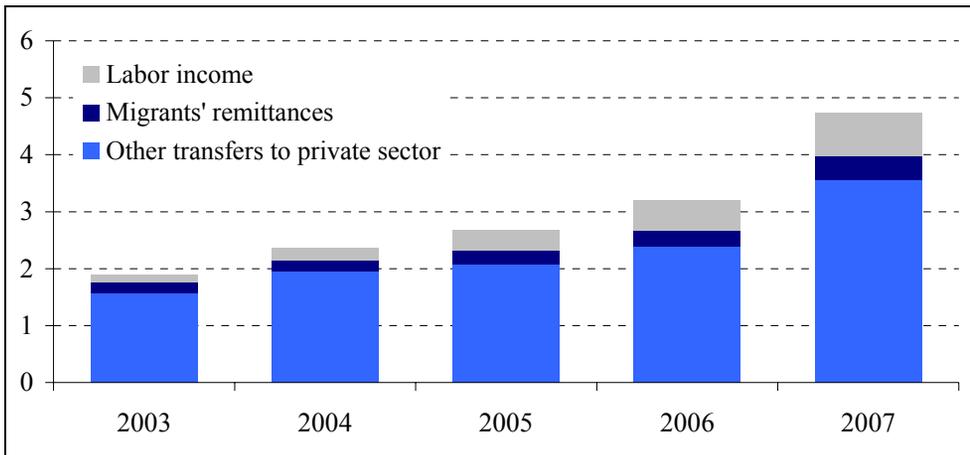
Source: NBU.

Another recent study by the International Fund for Agricultural Development (IFAD) puts Ukraine among the top world nations receiving the largest amount of migrants' remittances in absolute terms. The IFAD estimated total remittances transferred to Ukraine in 2006 at USD 8.5bn, or 8.0% of the country's GDP that year. To compare, inward remittances are estimated at 1.4% of GDP for Russia, 3.9% for Romania, and 1.4% for Poland (IFAD 2006).

Ukrainian official statistics on total workers' remittances and labor income abroad are far from complete and reliable. According to the balance of payments,

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[6] Statistics on migrants' remittances are estimated by summing up workers' remittances and compensation of employees categories from the Balance of Payments statistics.

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 the country. In order to upgrade statistics we classify transfers to "other sectors" as workers' remittances in line with the OECD recommendations. This gives us more realistic overall USD 2.4bn of transfers into Ukraine, or 7% of total household consumption.

Remittances are crucial for many Ukrainian households and regions. Anecdotal evidence suggests that remittances-induced domestic demand was the key factor behind dynamic development of local manufacturing in Western Ukraine. Migrants' remittances are spent in a number of ways: purchases of real estate, repairing of dwelling, purchases of cars, material aid for relatives, and payment for high education. Obviously remittances have many indirect effects which are in most cases difficult to quantify. First, remittances spent to pay for higher education enhance formation of the country's human capital contributing to higher potential GDP. Second, some returning migrants invest money in new business start-ups increasing economic potential of regional economies in the long-run. Remittances are also an important source of foreign exchange to Ukraine, which is especially important in view of growing deficit of merchandise trade and income balances observed in the country since 2005. Thus, inflow of remittances helps to partially compensate for otherwise increasingly negative balance of current account.

3.3.3. Database for CGE model

The household budget survey that we used to disaggregate income among types of households 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. Therefore, we have adjusted the data so as to reflect a plausible distribution of remittances across different types of households.

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 forth quarter of 2004. The quarterly household survey covers a sample of about 10,060 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.

3.3.4.   Simulation results

Simulations 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% (scenario 1), remittances are reduced by 70% (scenario 2), and labor supply increased by 5% (scenario 3) – see Table 3.2.

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, the assumption that TFP would be lower without migration and remittances implies a substantial indirect welfare gain through migration and remittances. Second, in the case of "no migration", the economy would have had a larger labor force and higher GDP. 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% and 14% 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% 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%), rich urban households may gain an extra 8% (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.

Table 3.2. Moldova: Simulation Results (base values and percentage changes in real terms)

	Base run	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Macro variables						
Domestic absoprtion	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 consump-tion	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	-5.8	7.4	1.6	-20.3
HH_O_URB	40	-18.3	-4.8	6.7	1.9	-18.4
HH_R_URB	20	-21.9	-5.3	8.4	3.1	-21.3
HH_PUB	20	-17.7	-6.7	6.6	-0.2	-19.7
HH_TRANS	60	-13.5	-3.9	5.6	1.8	-13.8

Note. Scenario 1 – TFP reduced by 10 pc (except in small-scale agriculture). Scenario 2 – Remittances reduced by 70 pc. Scenario 3 – Labor supply increased by 5 pc. Scenario 4 – Remittances reduced and labor supply increased. Scenario 5 – TFP and remittances reduced, labor supply increased.

3.4. Georgia [7]

Georgia is a small country that has seen a significant outflow of migrants and, at the same time, a large inflow of foreign currency in the recent years. While the available data only provide an incomplete picture, accumulated net migration since the beginning of the 1990s exceeded 880,000 individuals (with some return migrants in 2004 and 2005; Statistical Yearbook of Georgia 2007). Inward remittances to Georgia amounted to more than US$ 800 million in 2006, equivalent to about 10.2% of GDP and 72% of the incoming foreign direct investments (US$ 1,100 million)[8]. The size of unofficial remittances is also large, about US$ 315 million or 39.4% of the total amount of remittances[9]. Meanwhile, according to the official sources, about more than a third of population (35%) is below the national poverty line: Georgia is ranked 97th in the list of countries by human development index in 2006.

The main purpose of this study is to analyze the poverty effect of remittance flows in Georgia through direct and indirect channels within the context of the social accounting matrix based CGE model. The main questions of interest are whether and to what extent a large size of the remittance flows contributes to the production and consumption pattern of the poor. Two aspects of poverty reduction are emphasized in this study: (1) the impact of remittances on the aggregated and sectoral production growth; and (2) the impact of remittances on poor households, their production and consumption patterns across regions. In addition, this study pays particular attention to regional differences in terms of market access and transaction costs, apart from households' factor endowments and consumption patterns reported elsewhere.

The available Georgian data cover the national accounts, including the input-output table, detailed balance of payments, annual report on household surveys[10], and raw data on household budget surveys for 2004. These surveys were conducted in 3551 households inhabiting the capital city (Tbilisi) and 9 regions through the questionnaires "*Shinda 04*" for household expenditures, "*Shinda 05*" for private and state transfers to households, and "*Shinda 05-1*" for households

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[8] Georgian-European Policy and Legal Advice Centre (GEPLAC): Georgian Economic Trends, Quarterly Economic Trends, February, 2008.

[9] Georgian-European Policy and Legal Advice Centre (GEPLAC): Georgian Economic Trends, Quarterly Economic Trends, October, 2007.

[10] SDSG: "Households of Georgia", 2003-2004

income from employment and self-employment which are used in this study[11]. The source of the data is the State Department for Statistics of Georgia (SDSG).

3.4.1. General macroeconomic and institutional environment in Georgia

Georgia is a mountainous country with population of 4.5 million and area of 69.7 thousands sq. km. The topographical features of the country's territory are very contrasting including the Great Caucasian chain (5,068 meters above the sea level), the medium height mountains (about 3000 meters) and inner lowlands (e.g. Kolkheti and Alazani) which are used predominantly for cultivating tea, citrus, grapes and other agricultural products (the arable area is about 11% of the territory). There is a total of 12 regions in the country, including a capital region (Tbilisi), two autonomous republics and 9 ordinary regions, which are geographically and economically very diverse. The macroeconomic structure of the economy, in terms of the average shares of value added and total output by regions (Table 3.3), shows that industry and service activities are concentrated mostly in the capital city Tbilisi and a few other regions located predominantly at inner lowlands (e.g. Region 4). Agriculture is more widespread across the regions and plays a crucially important role as a source of production and employment. It accounts for about 21% of the gross value added and represents itself the largest employer of domestic labor (54%).

The macroeconomic situation in Georgia is characterized generally by high volatility caused by both external and internal factors. A slowdown in the annual growth rate, from 11.7% in 2003 to 7.5% in 2006, stemmed from the trade embargo imposed by Russia on Georgia in 2005 and 2006 as well as political instability and inflation pressures existing within the country. According to the annual reports of the Georgian central bank, the large sizes of current account (1.2 bn. USD) and trade (2.0 bn. USD) deficits in 2006 originated from the fall of exports, followed the Russian trade embargo. High prices for the imported mineral products have also amplified inflation; it rose to 9% in 2006 from the average rate of 5% during the period from 2000 to 2002. Additional inflation factors became the large inward remittances and capital flows in foreign currency. With underdeveloped capital markets, the central bank could not sustain effectively large sterilized interventions.

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[11]*Shinda* stands for the Georgian abbreviation of households observation (see State Department for Statistics of Georgia: "Households of Georgia, 2003-2004").

Table 3.3. The regions and main activities of Georgia

	Re-gions	Industry	Hotels and res-taurants	Transport and communi-cations	Construc-tion	Agricul-ture
Georgia, total *including:*		100.00	100.00	100.00	100.00	100.00
Kakheti	Reg. 1	3.62	0.52	0.11	1.77	14.32
City of Tbilisi	Reg. 2	43.47	77.83	78.99	63.00	0.10
Shida Kartli	Reg. 3	7.51	1.67	0.07	4.61	7.33
Kvemo Kartli	Reg. 4	21.36	1.64	1.87	4.44	18.67
Mtskheta-Mtianeti	Reg. 5	3.71	5.32	0.10	2.38	4.71
Samtskhe-Javaketi	Reg. 6	3.98	0.62	0.04	0.81	7.66
Adjaria	Reg. 7	2.64	5.76	8.04	3.74	5.27
Guria and Racha-Lechkhumi	Reg. 8	1.28	0.79	0.08	1.36	6.88
Samegrelo-Zemo Svaneti	Reg. 9	1.83	2.10	10.32	14.51	16.62
Imereti	Reg.10	10.59	3.76	0.37	3.39	18.45

Source: SDSG.

The local market conditions and institutions in Georgia are characterized generally by fragmented labor and credit markets, while the number of people living below the poverty line is large. In order to demonstrate the poverty situation in Georgia, households are grouped into three categories based on the sample of 6754 respondents available in the household surveys. These categories include: 1) the group of poor households with monthly incomes less than 75 GEL[12]; 2) the group of middle-income households with incomes varying from 76 GEL to 200 GEL; and households whose incomes are higher than 200 GEL are assumed in this study as high-income or rich ones. According to the country-wide household data, about 43% of respondents lived below the poverty line in 2004. Rural areas have a higher poverty incidence (52%) than the urban ones (35%).

The poverty profile of household groups by major economic activities (Figure 3.4.2) is analyzed in terms of a head count ratio calculated within each group. Workers engaged in self-employment, family based business enterprises and farms have the highest poverty incidence (about 70%). One has to remark that the share of self-employed workers is very large, equivalent to about 50% of economically active population. Among the groups considered, private employers have the lowest poverty incidence of less than 10%.

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[12] This threshold is chosen because it corresponds to the minimum subsistence level (75 GEL) in Georgia (see SDSG: Statistical Yearbook of Georgia for 2006).

A comparison of the regions in terms of individual income reveals a large difference in intra-regional poverty (Table 3.4and Figure 3.2). The median level of household incomes is lower than the mean level and this is true for all regions, confirming again a very high overall poverty incidence. Moreover, both median and mean levels vary largely from one region to another, that is from 53 GEL and 74 GEL in Region 7 (Adjaria) to 132 GEL and GEL 177 in Region 2 (Tbilisi). From the standard deviation values and the shapes of income distributions traced on the basis of individual incomes for every region, one can observe that differences in terms of poverty gap are also very large between the regions.

Figure 3.2. The distribution of households by income level
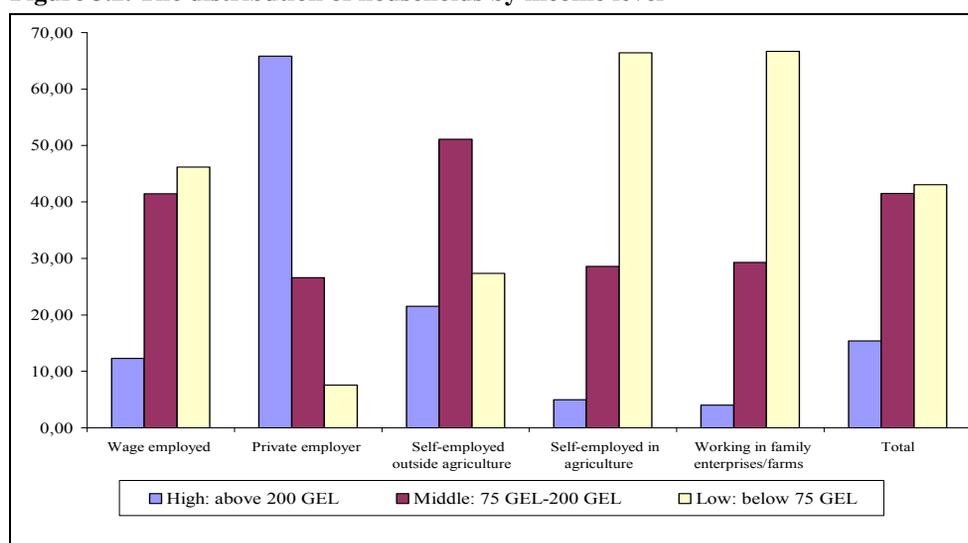
Note. Axis – households share by income level (%).

Table 3.4. Distribution of labor incomes by regions

	Reg. 1	Reg. 2	Reg. 3	Reg. 4	Reg. 5	Reg. 6	Reg. 7	Reg. 8	Reg. 9	Reg. 10
Maximum	1054	2000	500	950	767	3000	600	1000	850	667
Minimum	3	3	5	10	5	7	3	10	3	3
Mean	101	177	92	134	103	143	74	93	123	117
Median	68	132	70	109	70	100	53	70	87	80
Standard deviation	108	172	78	105	109	210	66	92	113	103

Source: the author's calculations.

Due to a high incidence of poverty as well as fragmented credit and labor markets, commercial banks are reluctant to extend loans to clients with low-income whose land and other assets are considered inadequate as collateral. In addition, the capital markets and pension fund systems are underdeveloped, while the insurance market is very small (0.3% of GDP). As a result, the poor members of the society especially in distant regions have limited or no access to credit markets or employment opportunities. According to Figure 4, households borrow funds more from physical persons (or other households) rather than from financial institutions and banks. One should remark also that the size of the borrowed funds varies largely from one region to another, implying a very limited access to these funds in some regions (e.g. Region 4, 5, 7 and 10).

Taking into account some of the above-mentioned features of the Georgian household sector as well as its macroeconomic and institutional environment, the direct and indirect channels between remittance flows and households well-being are analyzed. The standard IFPRI CGE model is modified by incorporating the regional dimension of market access, apart from differences in households' factor endowments and consumption patterns. The main questions of interest, in this respect, are whether and to what extend the poor households groups whose access to markets is limited can benefit from larger inward remittance flows and, thus, higher disposable incomes at the national levels.

Figure 3.3. Incomes across and within the regions
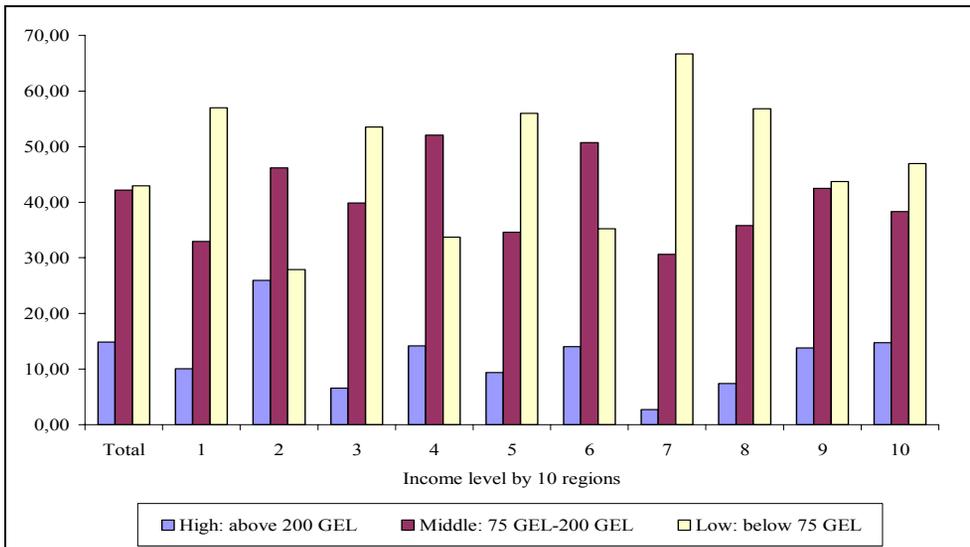
Note. Axis – Percentage of households (%).

3.4.2. CGE model with regional differences: data calibration and simulation results

The Georgian aggregated social accounting matrix is based on the standard IF-PRI approach, constructed on the economy-wide data. It represents 13 production activities from 18 sectors reported in the original input-output tables. The domestic production generates 12 commodities. The production of agricultural commodities is separated between large and small agricultural enterprises. Transaction costs among institutions, including households, enterprises and government originate in domestic sales, exports and imports activities. Production factors, which are capital, labor and self-employment, are decomposed between agriculture and other production sectors. Labor is split to high-, medium- and low-skill components using the sub-classification of employed by major work positions.

The original social accounting matrix has been modified in this study by disaggregating the small agricultural enterprises into three groups of regions. This was done in order to enable the regional dimension of the market access and transaction costs. A basic intuition behind this is that farmers located in the remote or mountainous areas of the country face higher transportation and marketing margins than other regions. In this respect, three types of household farms with the highest poverty incidence are distinguished in the model. These are the farm families located geographically in regions with high- medium- and low-transaction costs. The grouping of regions is based on the topographical features of the country's territory. In particular, regions located at the mountainous parts are considered of having high-transaction costs, regions with small cities and arable land face the medium-transaction costs, and the capital city (Tbilisi) with its surrounding is the third, i.e. low-transaction cost area. The regional disaggregation of small agricultural enterprises into three groups by transaction costs and household groups in the social accounting matrix is presented in Table 3.5. Clearly, urban households face lower transaction costs with about 88% of their production activities concentrated in the regions with low and medium transaction costs. As for rural households, about 40% of their production activities take place in the regions with high transactions costs.

In examining the poverty profiles, the household accounts are of particular importance because the flows of income and expenditures need to be adequately reflected in the social accounting matrix. Therefore, based on the level of incomes and geographical location, the households of Georgia are classified into six groups including rural-rich, rural-middle income, rural-poor, urban-rich, urban-middle income, and urban-poor.

Table 3.5. The distribution of small farmers by transaction costs and household groups

	Com-modi-ties in agricul-ture	Household								
		To-tal	Urban households				Rural households			
			To-tal	Rich	Middle income	Poor	To-tal	Rich	Middle income	Poor
Small agri-culture with:	1121	582	42	26	11	6	539	51	158	331
- low TC	345	173	1	1	0	0	172	16	51	106
- moderate TC	347	192	36	22	10	5	155	15	45	95
- high TC	429	217	5	3	1	1	212	20	62	130

Source: Input-output tables and household surveys (SDSG).

Five illustrative scenarios are set out in Table 3.6 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. Remittances lead to higher domestic absorption, larger imports and lower exports. The combined effect of the hypothetical lack of remittance inflows and emigration is negative with respect to all variables considered, with the strongest impact on the private consumption, domestic absorption and GDP growth rates which would be lower by 24.7%, 13.6% and 13.3%, respectively.

At the level of individual sectors, a simulated hypothetical stop in remittance inflows has a strongest influence on the manufacturing output, which decreases by 14.9% and large-scale agricultural production by about 8.7%. The impact of remittances on the production by household farmers (or small agriculture) is two-fold. In regions with low and high transaction costs, the production increases by 2.8% and 1.3%, correspondingly, while in the medium transaction cost regions it falls by 2.5%. Presumably, moderate transaction costs allow these farmers to decrease the farm related activities substantially and to get involved into other kind of market-related activities, once they receive remittances. The positive effect of remittances is pronounced in the construction (4.1%) and service (e.g. hotel and restaurants) sectors (2.6%). And the negative impact is on the electricity sector (-2.8%). The impact on the remaining sectors is negligible. The combined effect of remittance inflows and emigration is strongest in the small agriculture. Namely, the production of farms in regions with low, moderate and high transaction costs falls by 13%, 26% and 17%, correspondingly. Only the large agricultural sectors gain by about 14.3%.

Table 3.6. The results of SAM based CGEM simulations for Georgia

	Base run	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Macro variables						
Domestic absoprtion	11.3	-2.6	-4.7	7.1	2.4	-15.9
Private consumption	7.3	-4.0	-7.3	11.0	3.7	-24.7
Fixed investment	2.8					
Government consumpt.	1.1					
Exports	2.6	-12.7	11.9	8.7	20.5	-1.6
Imports	-4.2	-1.3	-4.3	5.5	1.2	-12.8
GDP at market prices	9.8	-5.9	-0.3	8.2	7.9	-13.3
Real exchange rate	97.1	-2.9	3.3	1.2	4.3	3.7
GDP at factor cost						
Large agriculture and other primary sectors	0.6	3.8	-8.7	-6.3	-14.3	-40.5
Small agriculture						
- low transaction cost	0.2	-9.6	-2.8	17.1	13.5	-12.4
- medium transaction cost	0.4	-10.9	2.5	22.5	25.5	3.1
- high transaction cost	0.3	-9.0	-1.3	18.7	17.3	-7.5
Manufacturing	0.7	-12.5	14.9	6.6	21.5	5.4
Electricity	0.3	-9.8	2.8	11.6	14.3	-12.7
Processing of products by households	0.4	-6.3	-1.9	10.1	8.4	-19.2
Construction	0.6	-3.3	-4.1	7.6	3.6	-16.5
Trade and repair of moto vehicles	1.0	-5.2	-1.1	8.1	7.0	-13.6
Hotels and restaurants	0.3	-6.8	-2.6	11.6	9.1	-18.9
Transportation	0.9	-7.6	0.4	9.5	10.0	-16.4
Communication services	0.4	-7.0	-1.2	10.7	9.5	-16.6
Financial, professional, other private, services	0.7	-6.4	-0.8	9.4	8.6	-14.7
Public administr./ NGOs	0.7	-3.7	-0.4	5.2	4.7	-7.9
Public services and private households	0.8	-4.5	-0.4	6.6	6.1	-9.2
Total	8.4	-6.1	0.0	8.5	8.5	-13.1
Household consumption (equivalent variation)						
Rural poor HH	0.9	-10.5	-1.0	15.5	14.9	-25.6
Rural middle-income HH	1.5	-6.8	-0.9	10.9	10.2	-20.3
Rural rich HH	1.4	-3.4	-7.8	10.5	2.6	-26.0
Urban poor HH	0.6	-4.0	-7.4	11.0	3.4	-23.9
Urban middle-income HH	1.2	-5.8	-5.0	11.8	6.8	-22.1
Urban rich HH	1.8	2.1	-16.9	8.9	-8.6	-29.0

Note. Scenario 1 – TFP reduced by 20 pc. Scenario 2 – Remittances reduced by 70 pc. Scenario 3 – Labor supply increased by 20 pc. Scenario 4 – Remittances reduced and labor supply increased. Scenario 5 – TFP and remittances reduced, labor supply increased.

In terms of households groups included in the model, the results reveal that emigration and remittance flows do not affect all residents symmetrically, but depend on the identity of households. In urban areas, remittances contribute to the increase of household incomes and consumption smoothing, while in rural areas the effect is positive, but rather week. For example, the groups of rural poor and middle-income households gain about 1% of their private consumption each, while in urban areas these groups gain 7.4% and 5.0%, correspondingly. One can observe also that the magnitude of this impact is smaller compared to that on rich households with the pure effect of remittances equivalent to 16.9% and 7.8% of private consumption, respectively, in urban and in rural areas. Consequently, re-mittances are beneficial to the wealthier members of this society (i.e. rich house-holds) in both urban and rural areas. An increase in the supply of labor by 20%, on the contrary, would improve the welfare of households in all groups. The rural poor would benefit most, with 16% higher private consumption, while this effect would be less pronounced for rich urban households, with about 9% higher private consumption.

The conclusion to be drawn from this exercise is that, while having a strong macroeconomic growth effect at the aggregated level, emigration and inward re-mittance flows do not affect all sectors and residents symmetrically. Moreover, they have a rather limited impact on reducing poverty and income inequality. In urban areas, for example, remittances contribute to the increase of household in-comes and consumption smoothing, while in rural areas the effect is two-fold. Namely, in regions with low and high transaction costs, remittances are beneficial to small farmers, while in the medium transaction cost regions the effect is oppo-site. Presumably, the moderate level of transaction costs allows these farmers to shift from subsistence to market-oriented activities, once they have access to re-mittances. The magnitude of the impact caused by remittances on the consumption pattern is smallest for the group of poor and middle-income rural households (1.6% and 1.0%, respectively) and largest for rich urban households. Under the absence of remittances, rich households would suffer a loss of about 16.9% in their private consumption. Consequently, the wealthier members of the society gain more from remittances than poorer household categories. Better access to labor markets, on the contrary, would improve the welfare of many, especially, of the rural poor at the outset.

Policy priorities, in these circumstances, should be given to a pro-poor ap-proach, especially, in improving institutional mechanisms through which the poor members of the society can have access to labor and credit markets within the country. With the focus on the inclusion of low-income and rural households in the financial sector, for example, the policies could be designed for meeting the

needs of household farmers in distant regions. This would include also enabling various possibilities for linking remittance flows to the microfinance based mechanisms focused on promoting savings, insurance and investment within regions, as well as decreasing transaction costs across the regions.

3.5. Kyrgyzstan [13]

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. The information on the scope of labor migration is fragmentary and based mostly on the information from the Kyrgyz embassies abroad. According to the conservative estimates of State Committee on Migration, about 250,000-300,000 individuals from Kyrgyzstan are currently working in Russia and around 100,000 in Kazakhstan.

The National Bank of the Kyrgyz Republic (NBKR) is responsible for compiling the balance of payments and consequently for statistics on remittances at the macro level. Since NBKR does not have all required information, it has to rely on several sensitive assumptions and existing data on money flows to estimate the magnitude of remittances. In particular, it has the following information on cross-border money flows involving participants in the Kyrgyz Republic:

1. Data on repatriated wages and salaries of foreign employees, who are not residents of the Kyrgyz Republic and are working in large joint ventures in the Kyrgyz Republic such as Kumtor Operating Company, the largest gold-mine enterprise;

2. Data on international money transfers to and from the Kyrgyz Republic done by individuals through banking accounts including card accounts (transactions below or equal to $3,000 are considered as workers' remittances), money transfer systems (e.g., the Western Union), as well as the postal system; and

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[13] Authors of this section: Aziz Atamanov and Roman Mogilevsky

3. Data on the number of permanent migrants to and from the Kyrgyz Republic and the estimated average value of the property that they bring with them to the country of destination.

Important limitation which NBKR faces is the lack of the information on the status of workers abroad and the economic nature of the transactions they made (e.g., intra-family transfer, payment for goods/services, person-to-person loan disbursements, etc.). Hence the current official statistics of remittances represent a mix of money flows of different economic nature.

There were several surveys aimed at estimating the magnitude of remittances and the profiles of labor migrants. Till recently on the micro level the household budget survey conducted by the National Statistical Committee did not distinguish remittances as a separate source of income. The most recent report prepared in the framework of the Asian Development Bank's project on remittances and poverty and financial sector development in Kyrgyzstan (Mogilevsky and Atamanov 2008) contains the most comprehensive analysis of the impact of remittances on poverty and financial sector in Kyrgyzstan. 3995 households were interviewed in the framework of this project, providing detailed information on the profile of labor migrants and remittances' recipients.

According to this survey, there were 251.5 thousands labor migrants working abroad that account for 5% of the total population and 8.1% of the working-age population. The regional distribution of the migrants reflects the regional level of economic development: About 70% of all migrants are from rural areas, 10% are from Bishkek and 21% are coming from other urban areas. The vast majority of the labor migrants choose Russian Federation (82.5%), followed by Kazakhstan (12%) and other countries (5.5%).

Most migrants are employed in the private sector dealing either with construction (45% of the total number) or trade activities (30.4%). Almost half of the migrants are seasonal workers. However, migrants from Bishkek differ from other regions of the country. More of them are employed in sectors requiring higher education and higher qualifications (financial intermediation, public administration, education, health care, etc.).

According to the survey, the magnitude of remittances coming to the country differs significantly from the official NBKR estimates which were growing exponentially during last years ($48.6 million. in 2002 and $730 million in 2006). However, the in-depth analysis shows that this rapid growth results mostly from increase in large and very large transactions, which cannot necessarily be attributed to labor migration.

ADB's estimates on remittances are significantly lower than official numbers and range from US$ 223.7 to US$ 287.1 million, with a confidence interval of

95%. Most remittances are going to the rural areas. The average amount of cash remittances per household in 2006 is US$ 1,331, accounting for 50% of the total average household income.

Remittances come to Kyrgyzstan mainly through banks and MTOs (78.5%), on the second place are households themselves (25.6%), on the third place are friends and relatives as a source of transfer; the role of postal services is negligible. All these show that the role of informal intermediaries is insignificant.

Simple correlation analysis of the workers' remittances (NBKR data since this is the only source of time series on remittances) and various macroeconomic indicators reveals that the growth of remittances contributes to some growth in private consumption and GDP, has a positive impact on imports and indirectly on government revenues, can be associated with some employment growth in informal sector and does not produce measurable impact on inflation and real exchange rate[14].

To have a more detailed picture on the impact of remittances on the Kyrgyz economy and the welfare of its citizens, a CGE model was used. The underlying social accounting matrix (SAM) for Kyrgyzstan is based on the national accounts for 2000-2004, input-output tables for 2003, and the household budget surveys for 2003-2004. It was also possible to draw on an existing SAM prepared by the World Bank for 2003, which has been 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 study. Specifically, the existing SAM has 91 sectors and households are divided into deciles for urban and rural areas. We aggregated it 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) agricultural smallholders with more than half of their total income from small-plot farming; (ii) other rural households; (iii) rich urban households (top 2 deciles by consumption); (iv) other urban households; (v) public employee households which draw more than half their income from public administration, health and social services; and (vi) pensioners with more than half of their total income from state transfers. Labor income is disaggregated into (i) income from low-skilled labor: 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:

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[14] However, the situation has changed dramatically in 2007, when inflation was about 20% which is more than cumulative inflation during the last 4 years. Such a sharp increase was triggered by external price shocks, but the impact of monetary factors cannot be neglected.

head of household has higher education; (iv) income from non-agricultural employment: household head is self-employed.

One could identify the following channels of labor migration's influence on the Kyrgyz economy: (i) increase in remittances, (ii) outflow of excess labor from agriculture creating conditions of some restructuring in the sector (e.g. some increase in farm size, more commercial orientation of farms run by households somewhat insured by remittance flows), probably leading to an increase in total factor productivity in this sector; and (iii) brain drain or, in terms of this model, outflow of high-skilled labor. Importantly, outflow of lower-skilled labor is considered to have no effect on labor supply as this labor is effectively unemployed on domestic market.

This considerations allow for formulating four scenarios for simulation of economic impact of labor migration:

1. Increase in remittances by 40%;

2. Increase in remittances by 40% accompanied by increase in total factor productivity in agriculture by 5%;

3. Increase in remittances by 40% accompanied by reduction in high-skilled labor supply by 10%; and

4. Increase in remittances by 40% accompanied by increase in total factor productivity in agriculture by 5% and reduction in high-skilled labor supply by 10%.

The simulation results (Table 3.7) suggest that higher remittances (Scenario 1) positively influence private consumption and production in sectors oriented mainly on domestic market (e.g. agriculture, food processing, trade). Higher remittances also allow financing increased imports. However, the inflow of foreign exchange into the country leads to real exchange rate appreciation with negative consequences for Kyrgyz exports and production in export-oriented (e.g. mining or machine production) and import-competing (e.g. light industry) sectors. Under this scenario, the overall effect of remittances on GDP appears to be near neutral.

Accounting for a TFP increase in agriculture along with higher remittances (Scenario 2) results in a more favorable performance of several GDP components, with even stronger (6%) growth of private consumption and smaller reduction in exports. On the contrary, assessment of combination of remittances and brain drain (Scenario 3) leads to much more modest private consumption growth and severe deterioration in exports (7.5% decline). Finally, under the last scenario of a simultaneous 40% increase of remittances, 5% improvement in farm's total factor productivity and 10% outflow of high-skilled labor, GDP increases by 0.6% due to growth in private consumption by 4.6% and despite of 5.9% reduction in exports.

Table 3.7. Kyrgyzstan: Simulation Results (base values in mln Kyrgyz soms and percentage changes in real terms)

	Base run	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Macro variables					
Domestic absoprtion	99402	2.5	4.2	1.5	3.2
Private consumption	68956	3.6	6.0	2.2	4.6
Exports	30766	-6.4	-4.8	-7.5	-5.9
Imports	38627	1.6	2.9	0.8	2.0
GDP at market prices	91541	-0.1	1.7	-1.2	0.6
GDP at factor cost					
Agriculture	28094	1.5	4.4	0.5	3.3
Food processing	1575	2.2	4.7	1.0	3.5
Light industry	281	-0.7	4.4	-2.0	3.0
Wood, furniture and printing	263	-3.3	-2.3	-5.9	-5.0
Mining and chemical industry	8459	-7.7	-6.8	-7.9	-6.9
Machine production	1265	-4.9	-4.4	-8.0	-7.5
Electricity and gas distribution	3576	0.0	1.5	-1.1	0.4
Construction	2301	-0.1	0.2	-0.4	0.0
Wholesale and retail trade	12286	2.4	4.3	1.3	3.2
Hotels and restaurants	1217	2.9	4.7	1.6	3.4
Transportation and communication	4210	-1.2	-0.2	-3.1	-2.0
Financial services	3161	-1.2	-0.3	-5.0	-4.1
Public administration	3839	0.0	0.2	-0.3	-0.2
Public and other services	5692	0.7	1.2	0.1	0.5
TOTAL	76219	0.0	1.8	-1.1	0.7
Household consumption (equivalent variation)					
Farming HH	7167	5.7	6.9	3.9	5.0
Other rural HH	19735	2.6	5.4	0.6	3.3
Rich urban HHs	12727	3.5	5.6	2.2	4.3
Other urban HH	11131	4.3	6.9	2.8	5.4
Public sector employee HH	8704	5.5	8.1	6.1	8.7
Transfer receiving HH	9300	3.6	6.1	1.9	4.4

Note. Scenario 1 – Remittances increased by 40%. Scenario 2 – Remittances increased by 40% and TFP in agriculture increased by 5%. Scenario 3 – Remittances increased by 40% and high-skilled labor supply reduced by 10%. Scenario 4 – Remittances increased by 40%, TFP in agriculture increased by 5% and high-skilled labor supply reduced by 10%.

All types of households win from increase in remittances. Depending on scenario, some of them win more and others win less. Under the last, "summary" scenario public sector employee households, farming households and other (e.g., more poor) urban households win more, and transfer-receiving and other rural households win relatively less from migration. These results reasonably probably reflect the fact that farming and poorer urban households have more migrant members, while transfer-receiving (e.g. pensioners) households send fewer migrants to work abroad.

4. Country Study: Russia

4.1. Data availability and quality

The data on immigration into Russia is notoriously unreliable due to the prevalence of illegal migration. State agencies report the number of the so-called "registered immigrants," i.e. those who comply with the laws that require that both Russian citizens and foreigners register with the authorities upon arrival to Russia (or to a new location). Alternatively, there is official data on the number of work permits issued by the migration authorities and the number of foreigners legally employed as reported by the companies. Thus, official sources put the number of immigrants arriving to Russia in 2006 at slightly over 0.186 million (see Table 4.1), with the CIS countries accounting for the most of this volume (0.177 million). Among them Kazakhstan, Uzbekistan and Ukraine sent over 30 thousands migrants each. The leading sources of immigrants from outside of the CIS were Germany and Israel. This number holds relatively constant starting with 2001, with the exception of 2003-2004 when it declined to roughly 0.120 million. In 2000, however, the total number of immigrants was almost twice as high (0.359 million), but already the next year it dropped to its current level.

Overall, according to the Russian State Statistical Agency, there were 1.014 million legally employed foreign nationals in Russia in 2006 (see Table 4.3), up from 0.7025 million a year earlier and 0.213 million in 2000. The largest sources of foreign workers in Russia, according to that data, were China (0.2108 million), Ukraine (0.1713), Uzbekistan (0.1051 million), Turkey (0.1014 million), and Tajikistan (0.0987 million). Overall, over half of all foreign workers arrived from the CIS countries (0.5377 million). Foreign workers are predominantly male (0.8585 million in 2006), while women account for only a small fraction of the total (0.156 million). The single most popular destination for immigrant workers is the *construction* industry employing 0.4141 million foreign workers in 2006 up from 0.2721 a year earlier. Next comes the *retail and wholesale trade* (including repair services) with 0.2709 million foreign workers. Agriculture and transportation employ over 40 thousand foreigners each, while "other services" employ less than 30 thousand. The presence of foreign workers in other industries is marginal. Nearly half of all foreign workers are concentrated in Moscow.

Table 4.1 Inflow of migrants into Russia (number of people)

	1997	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Total	*597651*	*359330*	*193450*	*184612*	*129144*	*119157*	*177230*	*186380*
CIS countries	*571903*	*346774*	*183650*	*175068*	*119661*	*110374*	*168598*	*177657*
Azerbaijan	29878	14906	5587	5635	4277	2584	4600	8900
Armenia	19123	15951	5814	6802	5124	3057	7581	12949
Belarus	17575	10274	6520	6841	5309	5650	6797	5619
Georgia	24517	20213	9674	7128	5540	4886	5497	6806
Kazakhstan	235903	124903	65226	55706	29552	40150	51945	38606
Kyrgyzstan	13752	15536	10740	13139	6948	9511	15592	15669
Moldova	13750	11652	7569	7562	6391	4816	6569	8649
Tajikistan	23053	11043	6742	5967	5346	3339	4717	6523
Turkmenistan	16501	6738	4402	4531	6299	3734	4104	4089
Uzbekistan	39620	40810	24873	24951	21457	14948	30436	37126
Ukraine	138231	74748	36503	36806	23418	17699	30760	32721
Non-CIS countries	*25748*	*12556*	*9800*	*9544*	*9483*	*8783*	*8632*	*8723*
Australia	57	27	25	22	30	42	30	28
Afghanistan	208	288	171	107	82	55	60	86
Bulgaria	750	245	255	238	212	125	118	109
Germany	2379	1753	1627	1962	2692	3117	3025	2900
Greece	183	182	124	150	224	182	200	176
Israel	1626	1508	1373	1670	1808	1486	1004	1053
Canada	73	50	74	70	103	87	99	77
China	2861	1121	405	410	346	212	432	499
Cuba	110	37	42	22	23	12	17	12
Latvia	5658	1785	1283	990	906	819	726	766
Lithuania	1785	945	758	722	535	339	360	371
Poland	247	61	56	53	39	48	55	48
Syria	483	358	260	144	101	56	68	67
USA	668	439	432	455	484	518	396	411
Turkey	176	164	184	144	112	77	86	172
Finland	140	83	97	136	125	141	129	137
Sweden	32	14	28	19	22	16	23	32
Estonia	3483	786	535	534	445	446	432	347
Other	4829	2710	2071	1696	1194	1005	1372	1432

Source: Table 5.9. International Migration, "Russia in Figures 2007", Russian State Statistical Agency

Table 4.2 Outflow of migrants from Russia (number of people)

	1997	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Total	*232987*	*145720*	*121166*	*106685*	*94018*	*79795*	*69798*	*54061*
CIS countries	*146961*	*82312*	*61570*	*52099*	*46081*	*37017*	*36109*	*35262*
Azerbaijan	4302	3187	2170	1704	1771	1336	1274	1366
Armenia	2578	1519	1362	1114	1098	654	620	686
Belarus	18928	13276	11175	8829	7016	5671	6034	6318

	1997	2000	2001	2002	2003	2004	2005	2006
Georgia	3286	1802	1339	964	939	740	691	593
Kazakhstan	25364	17913	15186	13939	14017	12504	12437	11948
Kyrgyzstan	6296	1857	1333	1080	959	656	473	605
Moldova	5715	2237	1660	1385	1234	907	786	636
Tajikistan	2474	1158	993	827	922	549	434	424
Turkmenistan	1532	676	352	272	251	168	125	112
Uzbekistan	7370	3086	1974	1400	1130	717	595	648
Ukraine	69116	35601	24026	20585	16744	13115	12640	11926
Non-CIS countries	*86026*	*63408*	*59596*	*54586*	*47937*	*42778*	*33689*	*18799*
Australia	297	176	184	144	146	167	209	167
Afghanistan	146	25	18	7	17	2	11	11
Bulgaria	668	180	163	133	156	160	124	116
Germany	48363	40443	43682	42231	36928	31876	21458	8229
Greece	886	314	204	190	186	157	155	139
Israel	12873	9407	4835	2764	2048	1733	1745	1408
Canada	1333	841	812	725	701	783	628	552
China	1222	658	156	151	86	154	456	196
Cuba	89	27	15	6	8	8	2	3
Latvia	636	365	311	256	259	226	211	223
Lithuania	1162	376	262	293	268	282	213	228
Poland	376	135	84	80	72	57	76	84
Syria	256	54	60	66	58	55	54	42
USA	9087	4793	4527	3134	3199	2919	4040	3109
Turkey	356	104	96	80	88	60	85	78
Finland	923	1142	980	1110	737	910	737	695
Sweden	151	195	148	162	151	158	110	132
Estonia	702	385	402	321	351	265	225	270
other	6500	3788	2657	2733	2478	2806	3150	3117

Source: Table 5.9. INTERNATIONAL MIGRATION, "Russia in Figures 2007", Russian State Statistical Agency.

This official data on "registered migration," however, seems to significantly underestimate the volume of migration flows, especially the volume of short-term migration of low-skilled workers from the CIS countries. On the one hand, citizens of most of the CIS countries do not require visas to travel to Russia which encourages migration. On the other, the system of registration in force in Russia throughout the 2000s was extremely burdensome. In order to obtain a registration an immigrant had to satisfy a number of conditions, most importantly, he had to have a place of residence and, moreover, to obtain a permission from his landlord to be registered at this particular address. The very fact of registration made a migrant (and his tax-evading landlord) "visible" and thus exposed him or her to extortion by the corrupt officials. Obtaining work permits was similarly burdensome. Employers also had all the in-

centives to encourage illegal immigration, for it gave them significant leverage over their unregistered and thus legally vulnerable workers.

Table 4.3. Number of foreign nationals employed in Russia (according to the Federal Migration service data (thsd people)

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Total	*213.3*	*283.7*	*359.5*	*377.9*	*460.4*	*702.5*	*1014.0*
Non-CIS countries	*106.9*	*135.1*	*154.9*	*197.4*	*238.5*	*358.7*	*476.1*
Vietnam	13.3	20.1	26.7	35.2	41.8	55.6	69.1
China	26.2	38.6	38.7	72.8	94.1	160.6	210.8
North Korea	8.7	9.9	12.7	13.2	14.7	20.1	27.7
USA	1.8	2.0	1.5	1.8	1.9	2.9	3.7
Turkey	17.8	20.9	15.4	37.9	48.0	73.7	101.4
From CIS countries	*106.4*	*148.6*	*204.6*	*180.5*	*221.9*	*343.7*	*537.7*
Azerbaijan	3.3	4.4	15.0	6.0	9.8	17.3	28.3
Armenia	5.5	8.5	12.6	10.0	17.0	26.2	39.8
Georgia	5.2	5.0	6.8	3.2	3.8	4.3	4.9
Kazakhstan	2.9	3.6	7.6	4.0	4.3	4.1	5.0
Kyrgyzstan	0.9	1.7	6.4	4.8	8.0	16.2	33.0
Moldova	11.9	13.3	40.7	21.5	22.7	30.6	51.0
Tajikistan	6.2	10.0	16.8	13.6	23.3	52.6	98.7
Turkmenistan	0.2	0.1	7.0	0.2	0.3	1.5	0.7
Uzbekistan	6.1	10.1	15.5	14.6	24.1	49.0	105.1
Ukraine	64.1	91.9	61.0	102.6	108.6	141.8	171.3

Source: Russian State Statistical Agency.

As a result, even the authorities themselves acknowledge the presence of a huge number of illegal immigrants. The magnitude of illegal migration is also underlined by the fact that after the registration procedure was reformed in 2007 (now foreigners don't need to ask the officials for registration, it is enough for them to simply notify the authorities about their new place of residence) the number of foreigners registering with the Federal Migration Service jumped, according to some accounts, threefold. Still, it is hard to get a reasonable estimate of the volume of migration. At the end of 2006 the head of the Federal Migration Service estimated the number of illegal immigrants in Russia at 10 million, while the United Nations Population Division (World Migrant Stock) estimated the number of international migrants in Russia at mid-year (both sexes) in 2005 at 12 million, about 6 million of them female; this number, according to the UN Population Division holds roughly constant throughout 1990s-2000s. However, independent experts in Russia criticize these estimates as overblown. According to the estimates by the Centre for Migration Studies in Moscow, the stock of immigrants present in Russia at a given moment is about 7 million. Roughly 0.5 million for

them are expatriate workers from the developed countries, while 5 to 6 million are "migrant labor." No more than 0.7 million of them come through official channels, while the rest arrive on their own. Among these about 20% follow the necessary legal procedures obtaining both registration and work permit, 30% register, but work without permit, and the rest (i.e. 50%) have neither registration nor permit (these estimates describe the situation before the 2007 reform of registration system).

Table 4.4. Foreign nationals employed, by sector (Federal Migration Service data)

	Thousand people		Percentage of the total by occupation	
	2005	2006	2005	2006
Total	*702.5*	*1014.0*	*100.0*	*100.0*
Agriculture and hunting	33.4	44.1	4.8	4.4
Forestry	17.8	28.5	2.5	2.8
Fishing, fish farms	0.7	1.2	0.1	0.1
Mining and quarrying	12.6	19.9	1.8	2.0
Manufacturing	48.7	72.2	6.9	7.1
Construction	272.1	414.1	38.7	40.8
Wholesale trade and commission trade; repair of motor vehicles, motorcycles; personal and household goods	213.9	270.9	30.4	26.7
Transport	29.5	43.3	4.2	4.3
Communication	3.5	3.7	0.5	0.4
Financial intermediation	1.9	4.2	0.3	0.4
Real estate, renting and business activities	0.5	0.9	0.1	0.1
Computer-related activities	0.6	0.8	0.1	0.1
Science and research	0.3	0.3	0.0	0.0
Geophysical, geological exploration	3.1	2.3	0.4	0.2
Land-surveying and cartographic activities	0.0	0.4	0.0	0.0
Education	1.0	1.0	0.1	0.1
Health and social work	2.2	2.8	0.3	0.3
Other community, social and personal service activities	13.6	24.1	1.9	2.4
Other activities	46.8	79.0	6.7	7.8

Source: "Russia in Figures 2007", Russian State Statistical Agency.

Official data on emigration from Russia should also be treated cautiously, for it accounts only for those who have chosen to register with the Russian authorities as residing or working abroad; however, citizens have no incentives to do so, not there are any enforcement mechanisms. With all that said, the number of departures from Russia in 2006 is officially put at 54,061, with 35,262 among them going to the CIS countries. This is a marked decrease compared to the level of

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2000 (145,720). Top destinations include Kazakhstan, Ukraine, Germany, and USA. However, the official data on the number of Russians that left the country in 2006 in order to work abroad is put at 65,747.

Table 4.5. Stock of migrants according to WB Migration and Remittances Fact book

Russian Federation (Europe & Central Asia; Upper middle income)			
Population (millions, 2006)	142	Surface area (1,000 sq. km, 2006)	17098
Population growth (avg. annual %, 1997–2006)	-0.4	GNI ($ billions, 2006)	958
Population density (people per sq. km, 2006)	9	GNI per capita, Atlas method ($, 2006)	5780
Labour force (millions, 2006)	73	GDP growth (avg. annual %, 2002–2006)	7
Urban population (% of pop., 2006)	72.9	Poverty headcount ratio at national poverty line (% of pop., 2004)	0
Age dependency ratio	0.4		
Emigration, 2005			
Stock of emigrants			11,480,137
Stock of emigrants as percentage of population:			8.0%
Top 10 destination countries: Ukraine, Kazakhstan, Belarus, Israel, Uzbekistan, United States, Latvia, Germany, Moldova, Estonia.			
Skilled Emigration, 2000			
Emigration rate of tertiary educated			1.3%
Emigration of physicians			1,875
as % of physicians trained in the country			0.3%
Immigration, 2005			
Stock of immigrants			12,079,626
Stock of immigrants as percentage of population			8.4%
Female as percentage of immigrants			57.8%
Refugees as percentage of immigrants			0.0%
Top 10 source countries: Ukraine, Kazakhstan, Belarus, Uzbekistan, Azerbaijan, Georgia, Armenia, Kyrgyz Republic, Tajikistan, Moldova			

Source: Migration and Remittances Factbook is compiled by Dilip Ratha and Zhimei Xu, Migration and Remittances Team, Development Prospects Group, World Bank. More information on other countries and regions are available at www.worldbank.org/prospects/migrationandremittances.

There is increasing attention on international migrant remittances as a development policy and financial stability issue. Official statistics on remittances are primarily collected and reported through the balance of payments statistics, but they are incomplete in many countries, may underreport remittance flows, and are often not comparable[15].

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[15] IMF Remittances Statistics portal (http://www.imf.org/external/np/sta/bop/remitt.htm).

The primary source of information about trans-border money transfers, including remittances is the Central Bank of Russia (CBR). According to the CBR[16] total money transfers to Russia amounted to US$ 7,500 million in 2006, with most of the funds transferred in favor of residents - 66% (US$ 5.0 billion) compared with 55% (US$ 3.5 billion) in 2005. Total outward money transfers were estimated at US$ 18,800 million in 2006.

Cross-border remittances via money transfer systems accounted for 32% of outward money transfers from Russia in 2006 (28% in 2005) and for 17% of inward money transfers to Russia (16% in 2005).

The flow of remittances via money transfer systems has risen considerably in the past few years. It amounted to US$ 7.3 billion in 2006. Between 2003 and 2006, the volume of remittances grew at an annual rate of 150-160%. The high growth rate was largely maintained by remittances from Russia.

The value of remittances from Russia increased by 69% in 2006 on annual basis up to US$ 6.0 billion. Compared with 2004, they grew by 190%. Remittances to Russia grew slower. Their value increased by 25% in 2006 on a year-to-year basis up to US$ 1.3 billion. Compared with 2004, they grew by 68% (Table 4.6).

The CIS countries accounted for most of remittances from Russia in 2006 (90%). Their value totaled $5.4 billion. Money transfers to Russia came both from non-CIS countries (US$ 0.7 billion) and CIS countries (US$ 0.6 billion) in 2006.

The *average sum* of one remittance from Russia increased by 19% in 2006 (comparing to 2005) to US$ 546 per transaction. The average remittance to non-CIS countries was twice as much as the sum of one remittance to CIS countries (US$ 1,349 and US$ 511, respectively).

In 2006, Uzbekistan (16.7%), Tajikistan (15.9%), Ukraine (15.4%), Armenia (10.1%) and Moldova (8.7%) were the main recipients of money remittances from Russia carried out via money transfer systems. Ukraine registered the smallest average remittance (US$ 364) from Russia.

The main remitting countries were the United States (14.6%), Kazakhstan (11.8%), Uzbekistan (7.0%), Ukraine (6.8%) and Germany (4.8%).

The geography of inward remittances was wider than that of outward remittances. In 2006, the top three remitting countries contributed to one-third of money received in Russia whereas the top three recipient countries accounted for almost 50% of remittances from Russia.

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[16] http://www.cbr.ru/eng/statistics/CrossBorder/Cross-border_06_e.pdf.

Table 4.6. Remittances according to the Central Bank of the Russian Federation

	2003	2004	2005	2006	2007
Total, $ million					
Money Transfers from Individuals in the Russian Federation	1,310	2,070	3,549	6,005	9,444
to non-CIS countries	…	…	323	622	868
to CIS countries	…	…	3,226	5,382	8,575
Money Transfers in favour of Individuals to the Russian Federation	588	777	1,041	1,304	1,681
from non-CIS countries	…	…	645	746	813
from CIS countries	…	…	396	559	868
Balance	…	…	-2,507	-4,700	-7,763
with non-CIS countries	…	…	322	123	-55
with CIS countries	…	…	-2,829	-4,824	-7,707
Average remittance, $					
Money Transfers from Individuals in the Russian Federation	…	…	457	546	623
to non-CIS countries	…	…	1,084	1,349	1,407
to CIS countries	…	…	432	511	589
Money Transfers in favour of Individuals to the Russian Federation	…	…	427	480	579
from non-CIS countries	…	…	506	536	583
from CIS countries	…	…	340	422	575

Source: Cross-border Remittances via Money Transfer Systems Reports of the credit institutions "Data on Transfers of the Individuals from the Russian Federation and Transfers to the Russian Federation for the Benefit of the Individuals and Transactions of the Resident Individuals with the Non-residents on the Territory of the Russian Federation", other reports of the credit institutions, reports of money transfer systems and of the government post service "Pochta Rossii".

Remittances without quid pro quo[17] accounted for 27% of money transfers from abroad in favor of individuals in 2006. Their value increased by 29% (US$ 0.3 billion) to US$ 1.4 billion in 2006. 80% (US$ 1.1 billion) of this amount was channeled via money transfer systems. Transfers in favor of non-residents totaled $2.5 billion in 2006 compared with US$ 2.9 billion in 2005. Their share in the structure of transfers dropped from 45% in 2005 to 34% in 2006.

As for the country profile of money transfers, Kazakhstan was the only CIS country, which remitted more funds to Russia than it received. The transfer of money from the sale of property by migrants leaving Kazakhstan for permanent residence in Russia played a noticeable role in this balance.

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[17] Remittances without quid pro quo include grants, donations, compensation payments, scholarships, pensions, alimonies, inheritance payments, gifts, and also all remittances made via money transfer systems.

The largest amount of money transfers from Russia went to China (US$ 2.5 billion) compared with other countries. These operations were largely conducted by non-residents. In terms of value, they accounted for one-third of all money transfers by non-residents from Russia. The average transaction was relatively large and equaled about US$ 20,000, exceeding by 30 times the amount of one money transfer by a non-resident from Russia to CIS countries. Over 60% of these transactions were performed by non-resident individuals from the Far Eastern and Urals Federal Districts of Russia, with the average size of a transaction equaling US$ 50,000. According to estimates, these transactions are related to payments for goods imported into Russia without proper customs clearance rather than to remittances without quid pro quo.

More than half of money transfers to Turkey were made by residents. Payments for the import of consumer goods and the services of travel agencies accounted for one-third of that amount. According to the CBR estimates, remittances by non-residents to Turkey largely included the transfer of part of wages received by Turkish citizens working in Russia to their families.

Among ten main recipient countries, the largest *average* transfer went to Switzerland (US$ 22,071) and the United Kingdom (US$ 26,256) while the smallest sums went to CIS countries: Ukraine ($491), Uzbekistan ($666), Tajikistan ($648) and Armenia ($754). According to CBR estimates, money transfers to the first group of countries were related to transactions conducted by residents from their accounts with Russian banks to their accounts with foreign banks. Meanwhile, transfers to the second group of countries were linked to transactions carried out by individuals temporarily working in Russia. An average transaction was larger in Uzbekistan and Tajikistan than in Ukraine because money was consolidated by one trusted person.

According to CBR estimates, the average *fee* per remittance abroad via money transfer systems was 3.7% of the remittance sum in 2006 (Figure 4.1). At the same time, the average fee was $20 for the average remittance of $500-$600. The size of remittance fee has decreased considerably in the past few years. The largest reduction was registered for remittances ranging from $100 to $200. In 2006, the remittance fee fell 7% on average compared with 2005 and 13% compared with 2004.

According to Word Bank estimates, the volume of inward remittance flow to Russia in 2006 was US$ 3,091 million, with the stock of emigrants estimated at 11.5 million. As one can see WB's estimates are twice as big as CBR's are. This is the case of inconsistency in statistical methods or incorrect terminology. CBR's figures on remittances include only personal trans-border transfers, contrary to the WB methodology which includes trans-border compensation of employees.

Figure 4.1. Average Fee for Remittances from Russia via Money Transfer Systems (% of remittance)
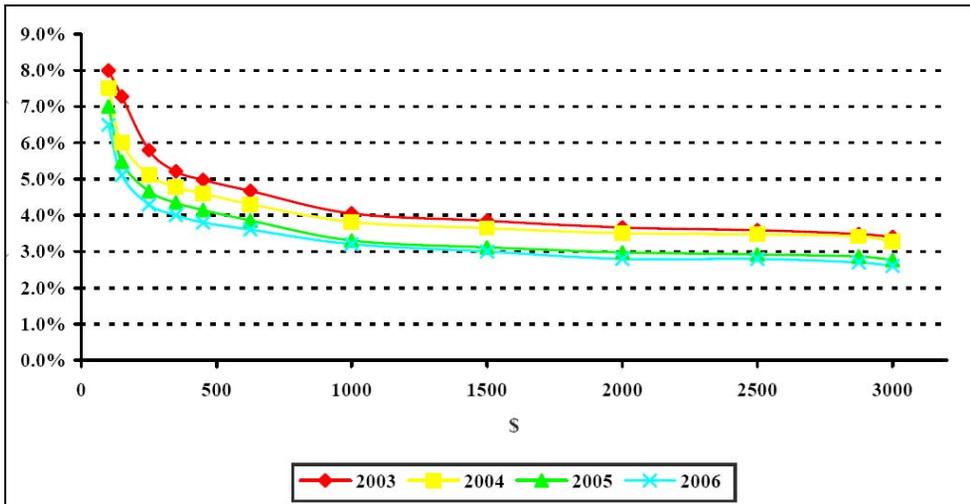
Source: CBR's survey of cross-border transactions of individuals:
http://www.cbr.ru/eng/statistics/CrossBorder/Cross-border_06_e.pdf.

The volume of remittances sent home by foreign workers in Russia is estimated by the World Bank (Migration and Remittances Factbook) at US\$ 11,436 million (2006), or 11.2% of GDP, of which US\$ 4,587 million are workers' remittances, and US\$ 6,038 million is defined as compensation of employees. The volume of remittances in 2006 increased sharply compared to the previous year (\$6,989) and even more so, compared to 2000 (US\$ 1,101 million). These estimates are made on the assumption that the stock of immigrants in Russia in 2005 was 12 million, as estimated by the UN Population Division.

Statistical base for social accounting matrices (SAM) in Russia is a "System of Input-output tables of Russia" published by Goskomstat. The last publication contains 2003 data. In order to build a Russian SAM for 2004 we had to update data using the available information from the National Accounts and Russian Statistical Yearbook for 2004. Structure of this database is close to the data requirements for the standard IFPRI model (Lofgren et al. 2002), with one exception: there is no data on transport and trade mark-ups.

4.2. Experiment design

Designing experiments for this model we kept in mind two possible channels of influence of an increase in migration on Russian economy: a direct one, account-

ing for a hypothetic increase in immigration; and an indirect one, steaming from an increase in total factor productivity in selected industries which are usual employers of immigrants.

We conducted three series of simulations, exploring direct and indirect effects of an increase in migration. In the first series consisting of ten experiments, we look at direct consequences of a 10% increase in migration and remittances relative to a previous simulation. Thus in the last simulation a cumulative increase relative to the benchmark is two-fold. The GAMS code and some additional information on the design of the first set of simulations are in the Table 4.7.

Table 4.7. Design of the first set of simulations, an increase in immigration and remittances

GAMS CODE: Experiment 1	
Parameter SHRMIGR /0.14/; trnsfrSIM(H,SIMNTBASE(SIM)) = (1 + (ord(SIM)-1)/10) * trnsfr(H,'ROW'); QFSSIM('LAB',SIMNTBASE(SIM)) = ((1 + (ord(SIM)-1)/10)*SHRMIGR + (1- SHRMIGR)) * QFS0('LAB');	
In each simulation households transfers to ROW (interpreted as remittances) and stock of immigrants in labour force increase by 1% relative to previous simulation. A first simulation is equivalent to benchmark. Migration and remittances increase twofold in last simulation relative to benchmark.	
Total labour force, thousand people (Source: Таблица 1.11.; ТРУД И ЗАНЯТОСТЬ В РОССИИ 2007)	74 146 200.00
Stock of immigrants (2005) (Source: WB Migration and Remittances Factbook)	12 079 626.00
Share of migrants in the total labour force (SHRMIGR)	14%

We assume that the share of remittances in the labor income of immigrants is constant. Thus the volume of remittances in local currency units (LCU) increases by the same factor as immigration does.

The second set of simulations aims at assessing indirect effects of increasing migration. According to Table 4.4 most officially registered immigrants are employed in construction (40% in 2006), trade (26%), transport (4.3%), agriculture and hunting (4.4%). We enlarged this list to cover all service sectors of the model. Indirect effect of an increase in migration is modeled as an increase in total factor productivity in service sector. In the second set of experiments we conducted ten runs. In each run total factor productivity in services increases by 5% relative to a previous experiment.

The GAMS code and some additional information on the design of the second set of simulations are in the Table 4.8.

Table 4.8. Design of the second set of simulations, an assessment of an indirect effects of an increase in migration (an increase in TFP in services)

alphavaSIM(AASERV,SIMNTBASE(SIM)) = (1 + (ord(SIM)-1)/20) * al-phava0(AASERV);
AASERV(A) services / A_sec14   Construction A_sec16   Transport and communication A_sec17   Trade A_sec18   Other services A_sec19   Housing A_sec20   Health sports social security education culture and arts services A_sec21   Science A_sec22   Finance administration defense and civil organizations /
In each simulation total factor productivity in services increases by 5%

Table 4.9. Parameter alphavaSIM – a shift parameter in CES activity production function, by industry for each simulation of the second set

3304 PARAMETER al-phavaSIM shift parameter CES activity production function		Bench-mark level	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM 10	SIM 11
A_sec1	Electricity and heat	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931
A_sec2	Products of Oil extraction and refinery	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
A_sec3	Coal	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931	1.931
A_sec4	Peat	1.998	1.998	1.998	1.998	1.998	1.998	1.998	1.998	1.998	1.998	1.998
A_sec5	Ferrous metals	1.741	1.741	1.741	1.741	1.741	1.741	1.741	1.741	1.741	1.741	1.741
A_sec6	Nonferrous metals	1.821	1.821	1.821	1.821	1.821	1.821	1.821	1.821	1.821	1.821	1.821
A_sec7	Products of Chemical industry and petrochemical industry	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989	1.989
A_sec8	Machinery and equipment, metal works	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827
A_sec9	Products of Forestry, wood-processing and paper-pulp industry	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
A_sec10	Construction materials (including glass, china and delftware)	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901	1.901
A_sec11	Products of Light industry	1.952	1.952	1.952	1.952	1.952	1.952	1.952	1.952	1.952	1.952	1.952

3304 PARAMETER al-phavaSIM shift parameter CES activity production function		Bench-mark level	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM 10	SIM 11
A_sec12	Products of Food-processing Industry	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867	1.867
A_sec13	Products of all Other industries	1.871	1.871	1.871	1.871	1.871	1.871	1.871	1.871	1.871	1.871	1.871
A_sec14	Construction goods	1.973	2.072	2.171	2.269	2.368	2.467	2.565	2.664	2.763	2.861	2.96
A_sec15	Agricultural goods and services in agriculture and forestry	1.577	1.577	1.577	1.577	1.577	1.577	1.577	1.577	1.577	1.577	1.577
A_sec16	Transport cargo and communication	1.999	2.098	2.198	2.298	2.398	2.498	2.598	2.698	2.798	2.898	2.998
A_sec17	Trade (including catering)	1.338	1.405	1.472	1.539	1.606	1.673	1.74	1.807	1.874	1.941	2.007
A_sec18	Other services	1.877	1.971	2.064	2.158	2.252	2.346	2.44	2.534	2.628	2.721	2.815
A_sec19	Housing	1.918	2.014	2.11	2.206	2.302	2.398	2.494	2.59	2.686	2.782	2.878
A_sec20	Health, sports, social security, education, culture and arts services	1.206	1.266	1.327	1.387	1.447	1.508	1.568	1.628	1.689	1.749	1.809
A_sec21	Science and scientific services, including geology and meteorology services	1.017	1.068	1.118	1.169	1.22	1.271	1.322	1.373	1.423	1.474	1.525
A_sec22	Finance, banking and insurance services, government and civil organizations	1.768	1.856	1.944	2.033	2.121	2.21	2.298	2.386	2.475	2.563	2.651

The third set of experiments (Table 4.10) combines design of the first and the second sets, i.e. in each experiment of this set there is an increase in labor immigration, remittances, and TFP in services.

Table 4.10. Design of the third set of simulations

```
Parameter SHRMIGR /0.14/;
 trnsfrSIM(H,SIMNTBASE(SIM)) = (1 + (ord(SIM)-1)/10) *  trnsfr(H,'ROW');
 QFSSIM('LAB',SIMNTBASE(SIM)) = ((1 + (ord(SIM)-1)/10)*SHRMIGR + (1-
SHRMIGR)) * QFS0('LAB');
* Increase in productivity in service sectors
alphavaSIM(AASERV,SIMNTBASE(SIM))=(1 + (ord(SIM)-1)/20) * alphava0(AASERV);
```

AASERV(A) services									
/									
A_sec14	Construction								
A_sec16	Transport and communication								
A_sec17	Trade								
A_sec18	Other services								
A_sec19	Housing								
A_sec20	Health sports social security education culture and arts services								

This is a combination of the set of simulations 1 and the set of simulations 2: In each simulation households transfers to ROW (interpreted as remittances) and stock of immigrants in labour force increase by 10% relative to previous simulation. First simulation is equivalent to benchmark. Migration and remittances increase twofold in last simulation relative to benchmark. In each simulation total factor productivity in services (set AASERV) increases by 0.05%

	Simulation number (The first set of simulations)								
Parameter	02	03	04	05	06	07	08	09	10	11
Capital rent (% to benchmark)	0.31	0.62	0.92	1.21	1.49	1.77	2.04	2.31	2.57	2.82
Wage (% to benchmark)	-0.31	-0.62	-0.92	-1.21	-1.49	-1.77	-2.04	-2.31	-2.57	-2.82

4.3. Results

Comparing results of all simulations we can conclude that both, direct and indirect effects are working in the same direction. As for numerical values, the indirect effect of migration, as it is modeled in the second set, dominates the direct effect of an increase in immigration and remittances.

Experiment 1: doubling the stock of immigrants and remittances

The consequences of an increase in the labor migration in the model could be characterized in the following way: as inward labor migration increases, supply of labor increases for all industries, since we do not have any labor market segmentation in the model. The present model set-up does not account for unemployment, either. Thus increase in the labor force pushes wages down in the whole economy. With the supply of capital being fixed, capital rent rises as wage goes down (see Table 4.11 for details).

We used the standard macro closure of the IFPRI model for all three sets of simulations. In this closure a country under investigation is assumed to be a small open economy with flexible exchange rate, fixed foreign savings and fixed capital formation.

Table 4.11. Results of the first set of simulations

Experiment 1	Description of a parmeter	Percentage increase of LF and remittances relative to benchmark.									
		10	20	30	40	50	60	70	80	90	100
QABSTOT	real absorption (LCU at base prices)	0.54	1.06	1.57	2.07	2.56	3.04	3.51	3.97	4.41	4.85
QHTOT	real household consumption (LCU at base prices)	1.14	2.25	3.34	4.4	5.44	6.46	7.45	8.43	9.38	10.3
QETOT	total real exports (LCU at base prices)	0.54	1.07	1.6	2.12	2.64	3.15	3.66	4.17	4.67	5.17
QMTOT	total real imports (LCU at base prices)	0.52	1.03	1.53	2.02	2.51	2.98	3.45	3.9	4.35	4.8
REXR	PPP real exchange rate (LCUs per FCU)	0.25	0.49	0.72	0.94	1.16	1.37	1.57	1.77	1.96	2.15
NEXR	nominal exchange rate (LCUs per FCU)	0.04	0.07	0.1	0.13	0.16	0.18	0.2	0.22	0.24	0.26
PDIND	domestic (non-tradables) price index (100 for base)	-0.2	-0.4	-0.6	-0.8	-1	-1.2	-1.4	-1.5	-1.7	-1.9
INVGDP	investment (% of nominal GDP)	-0.1	-0.2	-0.3	-0.4	-0.6	-0.7	-0.8	-0.9	-0.9	-1
PRVSAVGDP	private (household + enterprise) savings (% of nominal GDP)	-0.5	-0.9	-1.3	-1.7	-2.2	-2.5	-2.9	-3.3	-3.7	-4
FORSAVGDP	foreign savings (% of nominal GDP)	0.04	0.08	0.12	0.16	0.2	0.24	0.28	0.31	0.35	0.39
TRDDEFGDP	trade deficit (% of nominal GDP)	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5
GOVSAVGDP	government savings (% of nominal GDP)	0.3	0.59	0.87	1.14	1.4	1.66	1.9	2.14	2.38	2.61
IMPTAXGDP	tariff revenue (% of nominal GDP)	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05
DIRTAXGDP	direct tax revenue (% of nominal GDP)	0.01	0.02	0.04	0.05	0.06	0.07	0.08	0.08	0.09	0.1

The wage decrease drives domestic prices down and stimulates exports. Price ratio of tradables to nontradables goes up, as real and nominal exchange rate depreciate. Import is part of an aggregate commodity which is demanded by households and government for final consumption and by firms for intermediate use (see Figure 4.2 below.)

Thus increase in volume of production gives rise to intermediate use and demand for composite commodity. In a due course, this tendency gives rise to imports.

Figure 4.2. Commodity flows in the standard Ifpri model (Longfren et al, 2002)
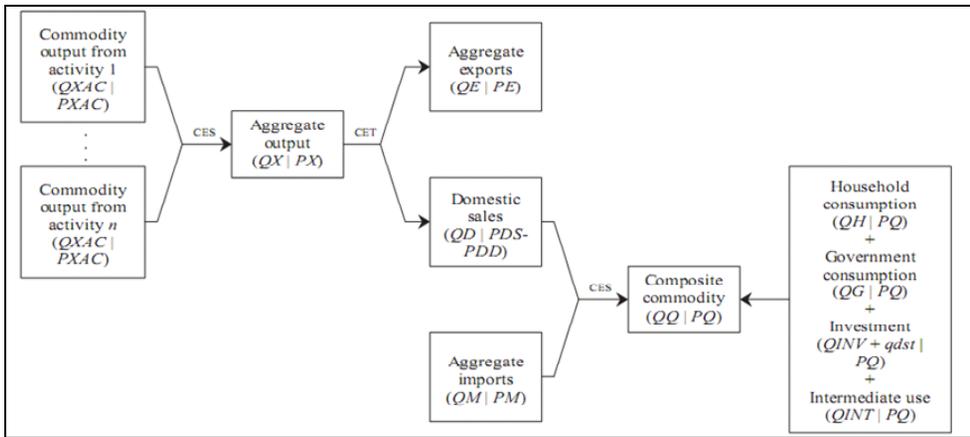
Note. CES is constant elasticity of substitution, CET is constant elasticity of transformation.

There is only one household in our version of the model. Thus we can not differentiate between residents of the country and labor migrants. An increase in migration affects the income of the representative household in two ways. First, the wage rate declines, but the labor force increases. Second, households are assumed to be the owners of the capital, thus all capital rent goes to the household budget. With an increasing labor force and declining wage rate, plus an increase in capital rent, household income increases as a result of an increase in immigration. An increase in household income and a decrease in domestic prices give rise in private consumption in all three sets of simulations.

Experiment 2: increasing total factor productivity in services

The indirect effects of immigration through higher TFP in services, as they are modeled in the second experiment, are much larger than the effects of immigration-induced increase in the labor force (cf. Experiment 1). For example, with a hypothetical 10 percent increase in TFP in services, total absorption increases by 8 percent and household consumption by 16 percent (vs. 1 percent and 2 percent, respectively, in Experiment 1). While it is difficult to establish a tight quantitative link between immigration and higher TFP in services, it is clear that the impact of any significant productivity gains would be large compared to the more conventional effects assessed in Experiment 1.

Experiment 3: doubling the stock of immigrants and increasing total factor productivity in services

Experiment 3 combines the immigration-induced increase of the labor force and outward remittances (as in Experiment 1) with the TFP increase in the services

sector (as in Experiment 2). The results are unsurprising, with labor force and TFP effects generally working in the same direction and adding to each other.

Table 4.12. Results of the second set of simulations

Experiment 2	Description of a parmeter	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM10	SIM 11
QABSTOT	real absorption (LCU at base prices)	3.92	7.74	11.46	15.09	18.64	22.12	25.53	28.88	32.17	35.4
QHTOT	real household consumption (LCU at base prices)	8.34	16.45	24.35	32.06	39.61	47	54.25	61.36	68.34	75.21
QETOT	total real exports (LCU at base prices)	2.17	4.29	6.38	8.44	10.48	12.5	14.51	16.5	18.47	20.44
QMTOT	total real imports (LCU at base prices)	4.13	8.17	12.14	16.06	19.93	23.76	27.56	31.33	35.07	38.79
REXR	PPP real exchange rate (LCUs per FCU)	0.93	1.63	2.11	2.4	2.52	2.48	2.32	2.06	1.69	1.26
NEXR	nominal exchange rate (LCUs per FCU)	0.96	1.74	2.35	2.82	3.14	3.35	3.46	3.46	3.39	3.25
PDIND	domestic (non-tradables) price index (100 for base)	0.02	0.1	0.24	0.41	0.61	0.85	1.1	1.38	1.67	1.97
INVGDP	investment (% of nominal GDP)	-0.61	-1.17	-1.68	-2.15	-2.59	-2.99	-3.36	-3.71	-4.03	-4.34
PRVSAVGDP	private (household + enterprise) savings (% of nominal GDP)	-2.25	-4.3	-6.19	-7.93	-9.54	-11.1	-12.5	-13.8	-14.99	-16.15
FORSAVGDP	foreign savings (% of nominal GDP)	0.32	0.63	0.94	1.25	1.55	1.84	2.12	2.4	2.67	2.93
TRDDEFGDP	trade deficit (% of nominal GDP)	0.39	0.77	1.14	1.5	1.85	2.19	2.52	2.84	3.15	3.45
GOVSAVGDP	government savings (% of nominal GDP)	1.31	2.49	3.56	4.53	5.41	6.22	6.97	7.65	8.29	8.88
IMPTAXGDP	tariff revenue (% of nominal GDP)	0.05	0.1	0.14	0.18	0.21	0.24	0.27	0.3	0.32	0.34
DIRTAXGDP	direct tax revenue (% of nominal GDP)	0.14	0.27	0.38	0.49	0.59	0.68	0.77	0.85	0.93	1

Table 4.13. Results of the third set of simulations

Experiment 3	Description of a parmeter	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM10	SIM 11
QABSTOT	real absorption (LCU at base prices)	4.47	8.83	13.1	17.29	21.4	25.45	29.44	33.36	37.24	41.06
QHTOT	real household consumption (LCU at base prices)	9.49	18.76	27.83	36.73	45.47	54.07	62.53	70.88	79.11	87.24
QETOT	total real exports (LCU at base prices)	2.71	5.38	8.02	10.63	13.22	15.8	18.37	20.92	23.46	25.99
QMTOT	total real imports (LCU at base prices)	4.65	9.23	13.74	18.2	22.62	27.01	31.37	35.7	40.02	44.31
REXR	PPP real exchange rate (LCUs per FCU)	1.17	2.06	2.72	3.17	3.44	3.54	3.52	3.38	3.15	2.84
NEXR	nominal exchange rate (LCUs per FCU)	0.99	1.78	2.41	2.87	3.21	3.42	3.54	3.56	3.51	3.4
PDIND	domestic (non-tradables) price index (100 for base)	-0.18	-0.28	-0.31	-0.29	-0.22	-0.12	0.02	0.17	0.35	0.54
INVGDP	investment (% of nominal GDP)	-0.73	-1.39	-1.99	-2.55	-3.07	-3.55	-4	-4.41	-4.8	-5.17
PRVSAVGDP	private (household + enterprise) savings (% of nominal GDP)	-2.68	-5.12	-7.36	-9.41	-11.3	-13.1	-14.7	-16.2	-17.6	-19
FOR-SAVGDP	foreign savings (% of nominal GDP)	0.36	0.72	1.07	1.42	1.76	2.09	2.41	2.72	3.02	3.31
TRDDEFGDP	trade deficit (% of nominal GDP)	0.35	0.69	1.02	1.35	1.66	1.97	2.27	2.56	2.84	3.11
GOVSAVGDP	government savings (% of nominal GDP)	1.59	3.01	4.29	5.44	6.48	7.43	8.29	9.08	9.81	10.49
IMP-TAXGDP	tariff revenue (% of nominal GDP)	0.06	0.11	0.15	0.2	0.23	0.27	0.3	0.32	0.35	0.37
DIR-TAXGDP	direct tax revenue (% of nominal GDP)	0.15	0.29	0.41	0.53	0.64	0.74	0.83	0.92	1	1.07

4.4. Conclusions

In this country study we analyzed direct and indirect consequences of increase in migration to Russia using standard IFPRI computable general equilibrium

framework. The benchmark CGE dataset – the social accounting matrix for Russia is unique and was created for this project. We presented a report on data availability on migration and remittances for the Russian economy. We presented three sets of CGE model runs simulating direct and indirect effects of immigration.

The most important driving force behind all results in the presented sets of simulations is a significant economy-wide wage rate decrease as a direct consequence of an increase in immigration. This effect is justified by the model settings but is not supported by the mainstream empirical literature on immigration.

From this literature we know the importance of personal characteristics, such as skill level, experience, major occupation, etc. General equilibrium analysis would be much more precise and rich with all these details incorporated in the model. This exercise could be done if there were empirical estimates of the relevant parameters for Russia. But empirical literature on the consequences of labor migration for Russia is constrained by the availability of data, which is very scarce to say the least.

5. Conclusions

Our case studies of the impact of labor migration and remittances in several net emigrant countries and in Russia aim to provide a systematic comparative analysis, notwithstanding inevitable concerns about data quality and restrictive modeling assumptions. With this qualification, our simulation results demonstrate that in all net immigrant countries (Moldova, Ukraine, Georgia, Kyrgyzstan), private consumption is much higher than it would be in the absence of migration and remittances. The simulated decline is between 18 percent for Ukraine and 32 percent for Moldova (where the share of migrants in the labor force and the ratio of remittances to GDP is especially large). All income groups would be strongly affected, although the impact on the poorest groups varies across countries. All net emigration countries would also experience a modest real devaluation of below 3 percent and associated changes in sectoral output patterns.

In Russia, which hosts most migrants from the net emigration CIS countries, immigration mainly leads to an economy-wide wage decline. Although this result is conditioned in part by our assumptions, particularly the comparative-static nature of the CGE model with no additional capital investment in response to immigration, it is plausible that a large increase in the number of immigrants as in Russia will limit real wage growth. At the same time, Russia has actively encouraged some immigrants, especially of Russian ethnic background, to settle in Russia permanently, with a view to compensating for some of the population decline that Russia is experiencing. It remains to be seen whether these policies will be modified in response to the end-2008 financial crisis and the consequent slow-down in GDP growth and construction activity in particular.

These simulation results demonstrate the large benefits from labor migration and remittances for migrants themselves as well their home countries. Indirectly, at least, host countries such as Russia and the European Union will also benefit from higher incomes and greater economic security in their neighboring net emigration countries. Whether these potential benefits are realized depends importantly on government policies related to migration in both, home and host countries. Against the backdrop of the migration-related policies currently pursued in the CIS region and in the EU, four major policy implications emerge.

First, some CIS country governments faced with large migrant outflows have been reluctant, for political reasons, to even acknowledge that emigration is taking

place on a large scale. Consequently, they have failed to provide support services to migrants where such services would enhance the benefits from migration, limit the risks, and strengthen migrants' attachment to their home country. Such services include job placement into legal work abroad through official employment agencies, high-quality consular services for migrants abroad, advocacy with partner governments for limited-term work opportunities for their residents, etc. The absence of such support has made migration more costly to households, without offering attractive alternatives, and alienated migrants from their home country. By contrast, a forward-looking policy strategy for home countries would be to support migrants where they are most at risk, such as when seeking employment and dealing with host country authorities. This would render it more likely that migrants would favorably consider employment or investment opportunities at home in the future.

Second, for economic recovery to take hold in the smaller, natural-resource-poor CIS countries, fixed investments need to be sustained and increased further. Remittances could help to pay for such investment. However, the business and investment climate in many of these countries is so poor that, currently, remittances are only rarely used for productive investment. Government efforts to channel remittances into investment, which are debated in many CIS countries, will succeed only when all investors – migrants and non-migrants, politically well-connected or not – can expect to receive an adequate return on productive investments that is not diminished by parasitic public institutions.

Third, to promote social coherence in emigration countries, prudent government policies are called for to ensure that the income gains due to migration are shared, to some degree at least, by all households. Taxes on remittances are usually considered counterproductive as income from legal employment is already taxed in the host country and, in any case, remittances might simply be driven underground. However, since many CIS country governments rely on taxes on imports (especially VAT, but also import duties) for much of their revenue, government revenue typically increases along with remittance-driven imports (which are bought over-proportionately by migrant households). The extra government revenue can be used to maintain public infrastructure, provide social services and education (including to the children of migrants left at home or with relatives), and provide targeted income support.

Fourth, destination countries will increasingly find themselves competing not only for high-skilled migrants, but also for those willing to perform jobs that are otherwise difficult to fill (such as seasonal work in agriculture, construction, and social services). Russia, the most important host country for migrants from the CIS region, is currently offering legal employment on a fairly broad basis, but migrants' living conditions are frequently poor and harassment by authorities is en-

demic. Extending legal residence and employment to a larger share of migrants already in Russia, and strengthening the rule of law and ensuring fair treatment for migrants by authorities, would help to attract the growing numbers of immigrants that Russia will want to rely on as its economic growth continues.

In EU countries, legal employment opportunities for CIS country migrants are still severely limited but growing. Legalization programs in countries such as Italy and Portugal also create pockets of legal migrants that will probably become the hubs of migrant networks that will attract more family-based and other immigration from CIS countries in the future. It would be in the interest of both migrants and EU host countries to replace these haphazard legalizations with a forward-looking strategy for admitting migrants with good job prospects in the EU. Since the EU functions as a single labor market, such programs should be coordinated at the EU rather than the national level. For the benefit of both, CIS countries and the EU, the deepening of bilateral relations under European Neighborhood Policy should include enhanced opportunities for legal labor migration.

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