

SIMULATION OF ECONOMIC IMPACT OF VISA-FREE REGIME BETWEEN MOLDOVA AND EU

USING A COMPUTABLE GENERAL EQUILIBRIUM MODEL FOR ANALYZING THE IMPACT OF THE
ECONOMIC POLICIES RELEVANT FOR MOLDOVA'S EUROPEAN INTEGRATION

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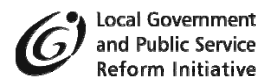
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ABOUT THE PROJECT

This document was developed as part of the project “Using Computable General Equilibrium Models (GCE) with Micro-Simulations to Analyze the Economy-Wide Impact of Economic Policies Relevant for Moldova’s European Integration”. The project was implemented by the Expert-Grup independent think-tank (Republic of Moldova) with the training and methodological support provided by the Kiel Institute for the World Economy (Germany). The financial support for this project was offered under the auspices of grant L9089, "The Policy Think Tank Bridging Initiative – Policy Research and Advocacy" of the Policy Association for an Open Society – PASOS funded by the Local Government and Public Service Reform Initiative of the Open Society Institute (LGI).

The main goal of this project was to create a platform for knowledge transfer from the Kiel Institute for World Economy (Germany) to the Expert-Grup think-tank (Moldova) on the use of Computable General Equilibrium (CGE) models and micro-simulations based on household data for economic policy analysis and for joint research using those analytic tools. This project addressed the limited capacity for professional quantitative analysis of economic policy in Moldova. By providing in-depth policy analysis and simulation, this project responded to the “Good Governance”, “Convergence with EU sectoral policies” and “Economic Integration” priorities identified in the Eastern Partnership component of the European Neighborhood Policy. The project is highly relevant also in light of priorities identified in the EU’s National Indicative Plan for the Republic of Moldova (Priority 1: Reform of the public administration and public finance management; Priority 3: Support in Poverty Reduction and Economic Growth). At the same time, this project addressed real policy issues that are currently discussed in Moldova as part of the larger agenda of country’s European integration.

In the framework of this project, Expert-Grup used its newly acquired skills for doing research on three examples of specific policy changes currently discussed in Moldova: 1) Impact of EU integration on the Moldovan agro-industrial sector; 2) Economic impact of liberalization of the visa regime with EU on Moldovan economy; and 3) Potential impact of a new Russia embargo against wine imports from Moldova. Results of the research will be used for conducting targeted policy advocacy, assisting in policy planning and raising awareness of the Moldovan government on these policy issues and of the EU policymaking community regarding Moldova’s needs.

Expert-Grup is grateful to Dr. Matthias Luecke, Dr. Manfred Wiebelt and Dr. Toman Omar Mahmoud from the Kiel Institute for the World Economy for the training provided on the CGE models and for their academic advice, suggestions and methodological support. Expert-Grup also would like to express its gratitude to the PASOS (Policy Association for an Open Society, www.pasos.org) and personally to Jeff Lovit, the PASOS executive director, and to the Local Government and Public Service Reform Initiative of the Open Society Institute (LGI) for the support provided to this project.

INTRODUCTION ON THE COMPUTABLE GENERAL EQUILIBRIUM MODELS

WHAT IS A CGE MODEL?

In theoretical and applied economic analysis the Computable General Equilibrium (CGE) models are represented by (usually very large) systems of linear and/or non-linear equations describing the behavior of economic systems varying from a household to national economy to global economy. This class of models is used for analyzing how policy changes and other economic shocks propagate through the economy. A CGE model basically shows how the economy moves from the initial equilibrium to the new one and what structural and quantitative changes accompany the shock.

There are many types of CGE models used in the applied economic analysis. The neoclassical models hinge on the traditional features of the Walrasian general equilibrium theory: firms maximize their profits, consumers maximize their utility, factors of production are fully employed, while equilibrium is achieved through changes in prices/wages. The CGE models built in the structuralist tradition allow for factors unemployment and for rigidities in wages/prices and make use of different assumptions about the macroeconomic balancing mechanisms. CGE models can be static (comparing only different equilibriums) or dynamic (showing how economy evolves towards the new equilibrium). While most of the CGE models deal only with the real part of the economy, some models may also include financial flows and monetary sector.

The CGE models are implemented based on the so-called Social Accounting Matrixes (SAM) for a given year. SAMs are comprehensive, economy-wide and detailed data sets, taking form of a square matrix describing real and monetary flows among different economic agents: activity sectors, commodities, households, enterprises, government and rest of the world. The level of disaggregation within the groups of economic agents – i.e. the number of accounts - depends on the statistical data available and purpose of analysis. In the SAM each account is represented by a row and a column, with the account's income appearing along the row and its expenditures along the column. The underlying principle applying in building a SAM is the equality involved by the double-entry accounting: for each account the total revenue (row-wise) equals its total expenditure (column-wise). To assemble a SAM it is typically necessary to combine information from many sources, such as national input-output accounts, household budget surveys, labor force surveys, fiscal and trade statistics.

A particular feature of the CGE models is that they explicitly recognize that changes affecting one part of the economy can have repercussions throughout the rest of the economy. They are particularly useful in capturing the indirect effects of a policy change on the entire economic system. CGE models are therefore very powerful analytical tools to influence policymaking. The range of issues suitable for a CGE-based analysis is very

large and includes structural adjustment, trade, fiscal, budgetary, agricultural, income redistribution, environmental and energy policies¹.

These models are widely used in many countries to understand and evaluate potential impact of policy but are absent in current policy discussion in Moldova. Using them will make for a quality shift in policy dialogue in Moldova. Most of the policy areas where CGE models would be particularly useful are directly related to Moldova's European integration policy. Such type of models would be particularly useful for applied economic analysis in Moldova, where the ambitious reform agenda demands professional ex-ante analysis of the policy changes. CGE model will provide necessary analytical support and alternative scenarios to feed public discussions with domestic and foreign partners on Moldovan economic policy. When combined with micro-simulations based on household data, CGE models will also give a sense of how the income distribution and poverty will change, which remains of crucial importance in Moldova.

FEATURES OF THE MOLDOVAN CGE MODEL

The CGE model developed for the purposed of this project is an extension of the IFPRI standard model that is fully documented in Lofgren et al. (2002). This model includes both structuralist and neoclassical features, including only the real economic flows, without considering the assets sector, inflation and banking sector. Considering the small size of the Moldovan economy any changes in the economic and trade relations with EU are normally expected to impact only Moldova. Therefore, the CGE has been built as a single country model assuming perfectly elastic demand for Moldova's exports and perfectly elastic supply of Moldova's imports.

The Moldovan CGE model is a comparative-static model, i.e. its use is limited to the analysis of the short- to medium-term effects of the policy and economic shocks. The model is therefore not suitable to analyse long-term dynamic effects arising, for instance, from the growths in the capital endowment. The database for the Moldovan CGE model is the Social Accounting Matrix (SAM) for 2008. The 2008 SAM combines information from input-output accounts, national income and product accounts, household budget surveys and labor force statistics provided by the National Bureau of Statistics. Some data have been taken from the fiscal statistics published by the Moldovan Ministry of Finance, while other data originate from the Balance of Payments compiled by the National Bank of Moldova. The 2008 GCE model for Moldova is based on very detailed SAM with 107 accounts, including:

- 37 activities (primary, manufacturing, and service sectors, with agriculture disaggregated into commercial enterprises versus small family farms with household consumption);
- 36 commodities;
- 3 accounts for transition costs (domestic, export and import);

¹ For a comprehensive overview of the use of CGE models see Devarajan and Robinsons, 2002.

- 6 factors of production: low-skilled, medium-skilled and high-skilled labour, capital, self-employment in agriculture and self-employment in other sectors;
- 8 household types: pensioners, urban-based public employees, rural-based public employees, small farmers, employed in big agricultural companies, others in big cities, other in small towns, other rural;
- 1 account for enterprises and 1 account for government;
- 8 accounts for different types of taxes;
- 4 trading partner regions: EU-27, Russia, other CIS countries, other countries.

In this model production is carried out under the assumption of perfect competition by sectors maximizing their profits, subject to a nested production function. For each activity, the top level of the production function is a Leontief function combining factors of production and intermediate inputs. At lower level, factors of production are combined according to a constant elasticity of substitution (CES) function, while the intermediate inputs are used in fixed proportions (Leontief function).

Aggregate domestic output is allocated by producers to exports and domestic sales based on the criteria of maximizing the profit with given prices, a given quantity of total output and imperfect transformability between domestic sales and exports. The degree to which output for domestic use can be transformed into export is given by a constant elasticity of transformation (CET) function. Exports to each trading partner region are similarly determined on the basis of a CET function that implies imperfect transformability between exports to the various regions. The model assumes a small price-taking economy. Domestic demand for a given good is the sum of demand for private consumption, government consumption, investment, and intermediate inputs. The optimal mix of imported and domestic goods is determined through cost minimisation via a CES aggregation function. Demand for imports from each trading partner region is similarly determined through a CES aggregation function for imports from the various regions.

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. In this model the 'standard' closures have been used: governmental savings are fixed, while direct taxes are fixed; private savings are investment-driven such that the marginal propensity to save adjusts to a given level of investment; exchange rate is assumed flexible, while foreign savings fixed. Factor market closures determine the mechanisms that equilibrate the supply and demand of each factor of production. In our simulations we have experimented combinations of three types of factor market closures: (i) a factor is fully employed and mobile; (ii) a factor is fully employed and immobile; or (iii) a factor is mobile but may be unemployed.

This CGE model may be thought of as representing the optimal description of the Moldovan economy given the available data. This feature renders the 2008 Moldova CGE models appropriate as an easy-to-use tool to be used by various stakeholders in the economic policy analysis.

OVERVIEW OF THE MIGRATION FROM MOLDOVA

SYNOPSIS OF MIGRATION PATTERNS

Emigration phenomenon in Moldova, which started after the collapse of Soviet Union, boosted during the Russian financial crisis in 1998-1999. Disastrous economic situation accompanied by jobs' closure, massive fires and decrease in wages or even non-payment of wages by insolvent enterprises and budgetary sector forced Moldovans to seek jobs abroad in order to survive and escape the poverty. In result of migration, the poverty rate decreased from over 70% in 1999 to less than 30% in 2004. Thus, the first migration wave was determined by push factors and was mainly oriented to the countries from the Commonwealth of Independent States (CIS), especially Russia, due to lower migration costs and knowledge of Russian language. According to some estimates, 77.4% of migrants in 2003-2004 worked in Russia, many of them being seasonal workers, returning home after 3-4 months of work².

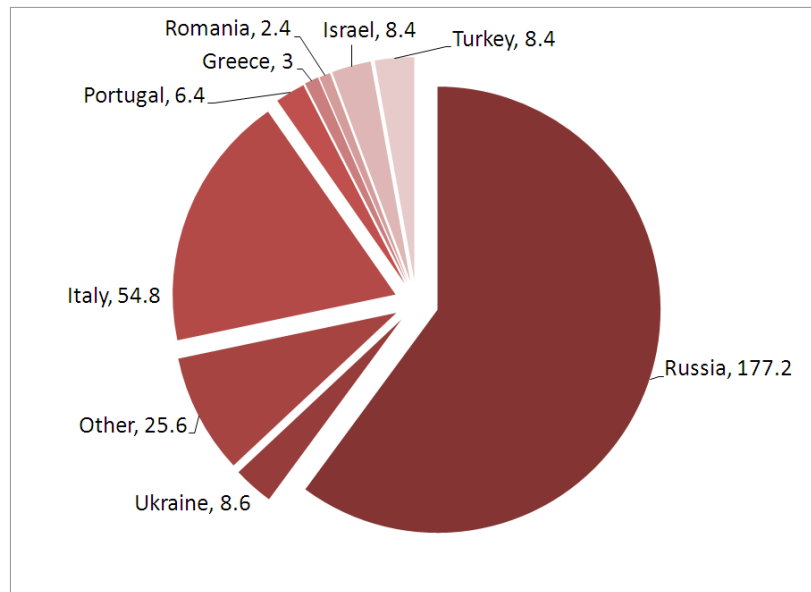
Shortly the situation has changed. Migration to EU countries spread, as migrants' informal networks created in many European countries started facilitating the arrival and entrance on the labour market of the new comers. In 2009, the total number of migrants reached 294.9 thou individuals, or 11.5% of the working age population, with two thirds working in CIS countries and about 24% in EU countries (as of 2008)³ (Figure 1). These are the Labour Force Survey (LFS) data estimating the number of migrants at a certain point in time. On the other hand, the CBS-AXA sociological surveys suggest that in 2008 more than half a million individuals of working age who belonged to a household in Moldova had a migration experience at some point in time⁴.

² "Migration and remittances in Moldova", CBS-AXA, IOM, 2005.

³ "Labour Migration and remittances in Moldova: Is the boom over?", IOM, 2009.

⁴ Idem.

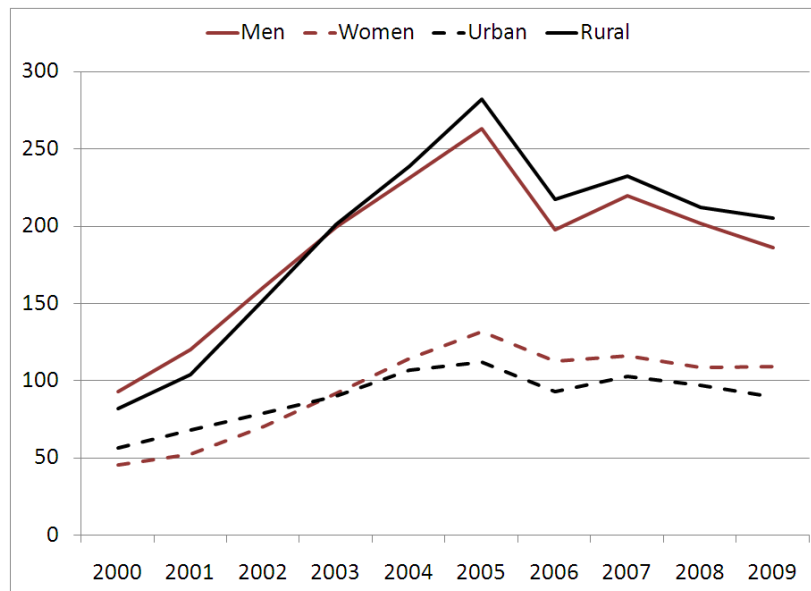
FIGURE 1. DISTRIBUTION OF EMIGRANTS BY COUNTRY OF DESTINATION, THOUSANDS, 2009



Source: National Bureau of Statistics of Moldova.

The majority of migrants are young and aged between 20 and 49 years, women representing over one third of migrants' stock (37%). As it is expected, the proportion of rural migrants is very high – 70% - due to the limited employment opportunities in rural areas (Figure 2). As regards the educational background of the emigrants, initially, mostly people with secondary education migrated. The share of migrants with higher education increased from 7-8% in 2000-2005 to slightly more than 10% in 2010.

FIGURE 2. NUMBER OF EMIGRANTS BY GENDER AND RESIDENCE AREA, THOUSANDS

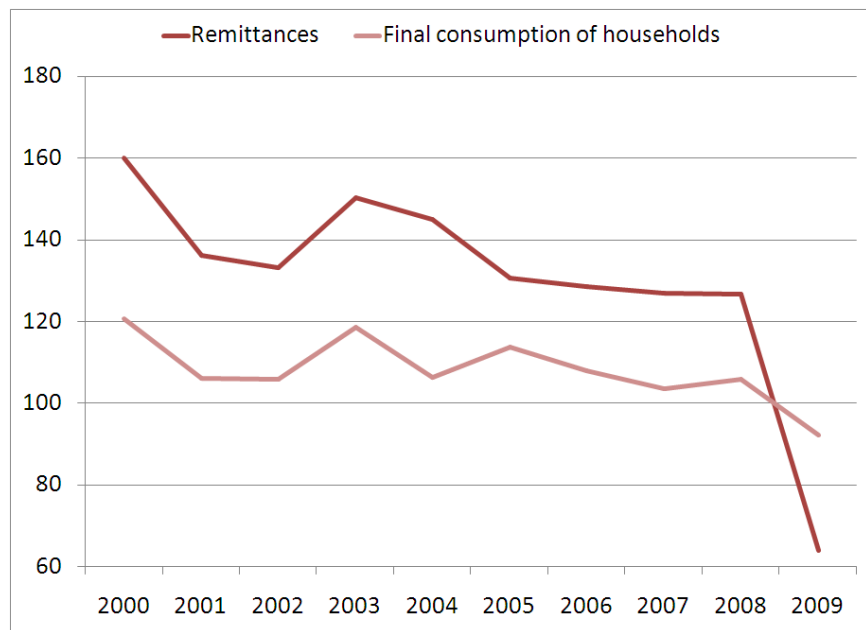


Source: National Bureau of Statistics of Moldova.

Unfortunately, despite the advancing educational background of Moldovan emigrants, their skills do not seem to be used in the host country. While there is only limited information on the extent to which migrants' skills matched their jobs abroad, some research found that in 2006 "only 27.3% of Moldovan emigrants work according to their qualification, while the majority of them (70.0%) perform work that has nothing to do with their occupation or qualification from their country of origin"⁵.

So far, remittances have been the most important outcome of migration. They grew on average by 38% per year during the 2000-2008 period reaching about one third of GDP and placing Moldova on the second place in the world according to remittances share in GDP. Average remittances per migrant accounted for 1848 USD in 2008⁶. They are an important share of households' income – 16.4% in 2009 (accounted for 58% of the incomes in migrant households and 15% in non-migrant households). Therefore, households with migrants are on average wealthier than households without migrants. Also, the incidence of poverty in households with migrants decreased faster than in families without members abroad. It was estimated that the remittances reduce by 11 percentage points the risk of population to live below poverty line⁷.

FIGURE 3. ANNUAL GROWTH RATE OF REMITTANCES AND HOUSEHOLDS' FINAL CONSUMPTION, %



Source: National Bureau of Statistics and National Bank of Moldova.

Given the extreme poverty of many households prior to migration, it is not surprising that a large portion of remittances was spent on meeting immediate needs and consumption. In fact, remittances were the main factor determining the boom of

⁵ "Migration models and problems of human capital development in Moldova", ETF, 2007.

⁶ "Labour Migration and remittances in Moldova: Is the boom over?", IOM, 2009.

⁷ "Poverty and Policy Impact Report", Ministry of Economy and Trade of the Republic of Moldova, 2007.

consumption after 2000, these two series being highly correlated (Figure 3) Therefore, the impact of financial crisis was felt by 1.5 million individuals receiving remittances from over 300 thousands individuals abroad, which immediately was reflected in the drop of consumption.

According to IOM study households with migrants tended to own more durable goods than households without migrants. Also, migrant households were twice as likely as non-migrant households to have purchased an apartment (house) or a car between 2006 and 2008, remittances money accounting for more than a half of the purchase price of these assets in approximately one third of households⁸.

WHO GOES TO EU?

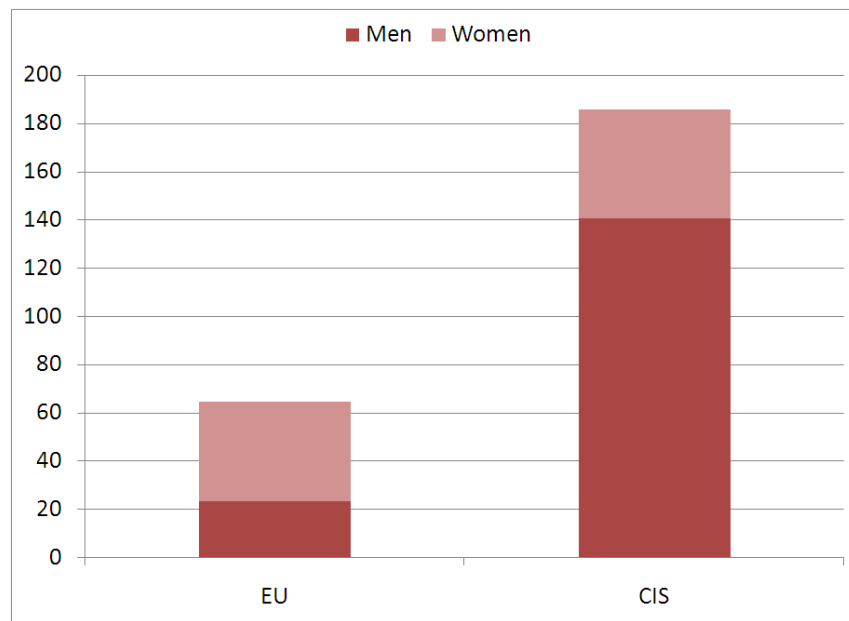
Although Russia is still the most important destination country for Moldovan migrants (60% of emigrants still working in Russia in 2009), the economic importance of EU migration is as important as or even more important than CIS migration. There are several important differences between migration to EU and migration to CIS countries that influenced the distribution of migrants between these countries and determine further perspectives for migration.

- Firstly, the reasons for migration to EU or CIS might be very different. For migrants going to CIS countries push factors are much stronger. Almost 40% of migrants to CIS left because of the lack of a job in Moldova and 25% to escape from poverty. These numbers are much lower for EU migrants – 26% and 13% respectively. Instead, for EU migrants, pull factors such as a recommendation of the country/place by acquaintances, good working conditions and existence of social contacts are much more important. Low costs of migration (visa-free, travel costs) represents the key pull factor for CIS migrants (indicated by 69% of migrants), which was insignificant for EU migrants⁹.
- Due to the specific of jobs in EU and CIS countries, the gender structure of migrants is very different by regions. Men go mainly to construction works in Russia (fewer go to other EU countries such as Czech Republic, Portugal, France), while women go mostly to European countries working in the service sectors (also, non-EU countries, such as Israel and Turkey). Thus, the structure of migrants to CIS countries is 24% of women to 76% of men, compared to 64% women to 36% men in EU countries (Figure 4).

⁸ "Labour Migration and remittances in Moldova: Is the boom over?", IOM, 2009.

⁹ "Patterns and trends of migration and remittances in Moldova", IOM, 2007.

FIGURE 4. NUMBER OF MIGRANTS BY GENDER AND REGION OF DESTINATION, THOUSANDS, 2009



Source: National Bureau of Statistics and National Bank of Moldova;

- The educational background of migrants differs a lot. Emigrants to CIS countries are mostly graduates of lower secondary and vocational education. Only 17% of emigrants to CIS have college or university degree. At the same time, the migrants to EU countries have a higher educational background, 37% of them possessing college or university degree. From this perspective, migration to EU countries is much more harmful for Moldova, because the educated people leaving the country for unskilled jobs abroad is only contributing to the wider brain-drain phenomenon.
- Furthermore, the destination of migration determines the legal status of the migrants. If before 2006 migration to CIS country was mainly legal due to visa-free regime with CIS countries and migration to EU was illegal, in most of the cases people leaving with a short-term visa and overstaying the duration of visa validity, the situation is changing now. Even if people migrate legally to CIS countries, few of them possess work permits, thus having an illegal status there. On the other hand, migrants to some EU countries (Italy, Spain) have benefited from legalization initiatives since 2006. However, approximately one third of migrants still reside in their host countries illegally¹⁰.
- Also, the duration of stay is very much dependent on the destination country. Seasonal jobs that are mainly available on CIS labour markets make migration to this destination short-term. On the other hand, high migration costs to EU countries (7-8 times higher than migration costs to CIS countries) and difficulties linked with getting a long-term multi-entry visa in EU countries

¹⁰ "Labour Migration and remittances in Moldova: Is the boom over?", IOM, 2009.

determine the longer periods of stay in EU countries (on average 15 months compared to 6 months in CIS countries¹¹).

- Finding a job does not seem to be difficult for Moldovan migrants. Most of migrants had found a job upon arrival or managed to find a job within two months after arrival. However, the migrants to EU face more difficulties, almost half of them do not have a job upon their arrival and about 13% are still unemployed two months after arrival.¹²
- The volume of remittances depends on the migrants' country of destination. On average, remittances from migrants working in EU countries are higher than of those working in CIS countries (2500 USD compared to 1675 USD in 2008), reflecting the discrepancies between earnings in these two groups of countries¹³. The same study suggests that the savings of the EU migrants are much higher than those of CIS migrants. Around 60% of CIS migrants send home more than 50% of their income and only 40% of EU migrants send this amount home.

¹¹ "Patterns and trends of migration and remittances in Moldova", IOM, 2007.

¹² Idem.

¹³ Idem.

USING CGE MODEL TO SIMULATE IMPACT OF A VISA-FREE REGIME BETWEEN MOLDOVA AND EU ON MOLDOVAN ECONOMY

WHAT TO EXPECT FROM A VISA-FREE REGIME?

Since 2008 the number of Moldovan migrants stabilized due to the global financial crisis that reduced the number of jobs available in many destination countries, permanent migration of some households, but also due to the emigration seemingly nearing its 'full capacity'. During 2006-2008 period about 100 thou individuals left Moldova permanently, 60 thou being individuals of households that migrated entirely. Of course, there are still many individuals who intend to migrate, but their number has decreased. According to the CBS-AXA survey the number of individuals who intend to migrate in near future decreased from 8% in 2006 to 6% in 2008¹⁴. Migration is still attractive for high-skilled individuals in particular, which may raise concerns about a possible brain drain for Moldova. Also, other studies show that most of returning migrants (51%) intend to migrate again. This is more common for men from rural areas with lower socio-economic status¹⁵.

Thus, a possible visa-free regime granted by EU to Moldova may result in few scenarios:

- Migration of potential migrants, whose number is decreasing according to many surveys; therefore we do not expect a dramatic boost of emigration. However, visa-free regime does not offer the right to work, but only the right to travel, which will not affect the European countries so much.
- Re-orientation of migrants from CIS to EU countries. Currently, many migrants are leaving to CIS due to visa-free regime and lower emigration costs. However, some of them save money for the subsequent migration to EU, where they expect higher income.
- Decrease in illegal migration. Currently individuals leaving to EU overstay their visa duration even in case of the lack of job in European countries due to the difficulties related to visa application procedures. Visa exemption may motivate migrants without a job to return home and leave back to EU when there are jobs available.

In the paper we intend to estimate the impact of visa liberalization on Moldovan economy: the expected change in the amount of remittances received and the changes on the Moldovan labour market taking into account the three mentioned scenarios.

¹⁴ "Labour Migration and remittances in Moldova: Is the boom over?", IOM, 2009

¹⁵ "Migration models and problems of human capital development in Moldova", ETF, 2007

POSSIBLE SCENARIOS

We estimate the economic impact of a visa-free regime between EU and Moldova based on three scenarios that take into consideration the patterns and potential of migration and remittances:

1. ***Increase only in remittances by 20%, with no changes in labour force (REMIT1)***. This scenario assumes an increase in number of migrants to EU from two possible sources. Firstly, a reorientation of some migrants in CIS countries to EU countries is possible, but at most 25% of these migrants that will also include seasonal workers. Despite higher income of EU migrants, we do not expect a change of destination country for the majority of the migrants as they will not change the job they have for an uncertain job in EU. However, a part of migrants who do not have a stable job or those who are sure they can find a better paid job with their qualifications in EU will change their destination. Secondly, individuals residing in the country may also intend to migrate and we consider that the most interested category may be the inactive population, so that no decrease in labour force is going to take place. Therefore, in the first scenario we look only at the increase in remittances. The estimated increase is 20% (associated with 100000 new migrants to EU) and it is calculated as the difference between average amount of remittances sent by an EU and a CIS migrant for 50000 migrants and below average amount of remittances sent by an EU migrant for 50000 new migrants. The second calculations are based on the assumption that new migrants, who do not have work experience abroad may have lower than average income in the initial stage of migration.
2. ***Increase in remittances by 20% and decrease in low-skilled labour force by 10% (REMIT2)***. Labour statistics indicates a more significant decrease in informal employment compared to formal employment during the last decade (with the exception of 2009-2010 - crisis period when the pattern has changed). This phenomenon was parallel to migration pattern. Thus, migration was an option for some individuals unsatisfied with their jobs. As the incidence of informal employment is higher among low-skilled individuals, we consider most likely the decrease in this category of the labour force. As regards the recent pattern of increasing share of migrants with higher education in the total cohort of migrants to EU, these does not necessarily mean high-skilled individuals. A deeper analysis of migration by level of education shows an increase of migrants with higher education only in the age group 25-34. Thus, these are mostly young individuals who graduated recently and could not find a job or performed an unskilled job, bellow their competences.
3. ***Increase in remittances by 20%, decrease in low-skilled labour force by 10%, decrease in small-scale agriculture labour force by 10% and increase in productivity in small scale agriculture by 5% (REMIT3)***. The most significant and constant decrease in labour force during the last decade was registered in agricultural sector and mostly in self-employment in agricultural sector (which

is small-scale agriculture). More than 50% of the agricultural employees activate in informal sector, from which 60% practice subsistence agriculture working on their small plot for own consumption. Therefore, we add to the previous scenario a 10% decline of agricultural workers in small-scale agriculture, that might consider to migrate. As a consequence a smaller amount of labour factor will be used for the same amount of capital factor (land) that will result in productivity increase in the sector estimated at 5%.

For all three scenarios we use the following CGE model-closure rules:

- Savings-Investment Closure: Investment-driven savings; fixed capital formation; uniform MPS point change for selected institutions.
- Rest of the World Closure: Fixed foreign savings; flexible exchange rate.
- Government Closure: Flexible governmental savings; fixed direct tax rate.
- Factor Market Closure: The quantity supplied of each factor is fully employed and mobile.

GENERAL EQUILIBRIUM EFFECTS OF A VISA-FREE REGIME

The first and most intuitive impact of an increase in remittances to (and consequently income of) the households is the rise in private consumption which vary for different scenarios between 7.6% and 8.7%. However, as the capital formation remained fixed and net exports decrease the overall impact on the GDP is negative if we account for changes in the labour force and marginally positive if only increase in remittances is expected (Table 1).

TABLE 1. SUMMARY INDICATORS OF GENERAL EQUILIBRIUM EFFECTS, % CHANGE FROM BASE SCENARIO.

	REMIT1	REMIT2	REMIT3
Absorption	5.2	4.9	4.56
Private consumption	8.7	8.2	7.7
Exports	-13.5	-14.6	-14.9
Imports	3	2.5	2.4
GDP at market prices	0.1	-0.4	-0.9
Net Indirect Taxes	0.3	-0.2	-0.5
Real exchange rate	-6.6	-6.8	-6.9
Nominal exchange rate	-4.6	-4.7	-4.8
Investment to GDP	-1.4	-1.3	-1.2
Private Savings to GDP	-0.3		0.1
Foreign Savings to GDP	-1	-1	-0.9
Trade Deficit to GDP	2.9	2.9	3.1
Governmental Savings to GDP	-0.3	-0.4	-0.4
Import Taxes to GDP	-0.1	-0.1	-0.1
Direct Taxes to GDP	0.1	0.1	0.1
Total current governmental income	1.3	0.8	0.4

Source: authors' calculations based on CGE model.

Under the mentioned macroeconomic closure rule (fixed foreign savings; flexible exchange rate) the increase in remittances will lead to a strong appreciation of national currency estimated between 6.6% and 6.9%. Such an evolution makes Moldovan exports more expensive and less competitive on global markets that will fall immediately (by 13.5% to 14.9%).

Some sectors are expected to register very significant decreases in exports: textiles (66%-69%), clothing (27%-29%), machinery and equipment (29%-30%). Despite lower drop in other export categories, high share of the sectors mentioned before (around 30% in 2008) explains significant overall contraction of the total exports (Table 2).

TABLE 2. CGE SIMULATION RESULTS: CHANGE IN REAL EXPORTS, % CHANGE FROM BASE SCENARIO.

	REMIT1	REMIT2	REMIT3
Agriculture and foodstuffs	-1.8	-2.7	-4.6
Extraction of raw materials	-6.3	-8.5	-8.5
Meat and fish	1.2	0.4	-0.3
Fruits and vegetables	-3.3	-4.4	-5.2
Oils and fats	-3.0	-4.0	-4.7
Dairy products	1.0	-0.1	-1.0
Other food	-7.0	-8.0	-8.4
Beverages	-5.2	-6.4	-7.4
Tobacco products	-14.9	-15.8	-16.1
Textile products	-66.0	-67.9	-68.6
Clothing	-27.0	-28.8	-29.1
Wood products	-7.8	-8.2	-7.9
Paper and paper products	-3.9	-4.4	-4.5
Printing	-4.7	-5.5	-5.5
Coke, oil refinery, chemical	-13.4	-14.1	-13.8
Rubber and plastics	-6.4	-6.7	-6.6
Other non-metallic minerals	-7.0	-7.7	-7.6
Machinery and equipment	-29.1	-30.4	-29.8
Furniture and other products	-10.4	-11.6	-11.4
Construction	-2.7	-2.9	-2.9
Hotels and restaurants	-5.3	-6.1	-6.4
Transport and warehousing	-6.1	-6.8	-6.8
Communication	-3.2	-3.6	-3.7
Financial activities	-2.7	-3.1	-3.0
Computers and related activities	-6.2	-6.3	-6.1
Other commercial services	-3.3	-3.8	-3.9

Source: authors' calculations based on CGE model.

Consequently, this will determine the output that will decline by similar amounts in sectors mostly oriented to exports (textile, clothing, machinery and equipment). As most other sectors register an increase in production, the overall decline is around 0% -

1%, with almost no change in case of the first scenario, where only remittances increase (Table 3).

TABLE 3. CGE SIMULATION RESULTS: SECTORAL OUTPUT, % CHANGE FROM BASE SCENARIO.

	REMIT1	REMIT2	REMIT3
Large-scale agriculture	7.5	5.7	13.3
Small-scale agriculture	0.0	0.0	-5.5
Extraction of raw materials	-1.0	-2.3	-2.4
Meat and meat products	6.1	5.5	5.0
Fruits and vegetables, cereal products	1.7	0.8	0.2
Oils and fats	1.4	0.6	0.0
Dairy products	6.4	5.7	5.0
Animal feed	0.1	-0.7	0.3
Other food products	4.6	4.0	3.5
Beverages	0.8	-0.1	-0.9
Tobacco products	0.9	0.2	-0.3
Textile products	-64.5	-66.4	-67.0
Clothing, leather and leather products	-24.3	-26.0	-26.2
Wood products	-2.7	-3.1	-3.0
Paper and paper products	-2.0	-2.5	-2.7
Printing and publishing	1.6	1.0	0.8
Coke, oil refinery, chemical	-7.5	-8.1	-7.9
Rubber and plastics	-3.0	-3.4	-3.4
Other non-metallic minerals	-2.5	-3.0	-3.0
Machinery and equipment	-25.2	-26.4	-25.9
Furniture and other products	-5.8	-6.7	-6.7
Waste recovery and recycling	-3.1	-3.4	-3.4
Electricity, gas, water distribution	1.9	1.4	1.2
Construction	0.5	0.4	0.3
Retail and wholesale trade	-0.1	-0.7	-0.9
Hotels and restaurants	-0.3	-1.0	-1.3
Transport and warehousing	-2.2	-2.9	-3.0
Communication	2.6	2.1	1.9
Financial activities	3.2	2.7	2.5
Real estate transactions	3.6	3.2	2.9
Computers and related activities	-1.2	-1.3	-1.3
Research and development	-1.2	-1.5	-1.4
Other commercial activities	2.2	1.7	1.5
Public administration	2.2	2.0	1.9
Governmental services	1.7	1.6	1.5
Other services	8.1	7.6	7.3
Services in private households	6.9	6.5	6.2
TOTAL	0.0	-0.5	-1.0

Source: authors' calculations based on CGE model.

Production is expected to increase in large-scale agriculture in order to replace the decline of small-scale agriculture, especially in the third scenario, when labour force in small-scale agriculture is declining by 10%. Output also increases in sectors oriented to

internal consumption that is an expected outcome of an increase in households' income. Thus, the most significant increase is expected in service sector, meat and fish production and dairy products.

As previously, increasing demand will be only partly satisfied by national producers, imports also increasing in order to satisfy the internal demand. Thus, while imports of goods for final consumption are expected to increase (especially meat and fish, oils, dairy products, other foodstuffs, furniture, electricity, gas and water and services), import of intermediary goods for export production will decrease (textile) (Table 4).

TABLE 4: CGE SIMULATION RESULTS: CHANGE IN REAL IMPORTS, % CHANGE FROM BASE SCENARIO

	REMIT1	REMIT2	REMIT3
Agriculture and foodstuffs	8.0	7.6	8.7
Extraction of raw materials	4.0	3.7	3.5
Meat and fish	10.1	9.6	9.5
Fruits and vegetables	9.1	8.8	8.5
Oils and fats	11.5	11.2	11.1
Dairy products	10.9	10.6	10.2
Animal feed	5.6	4.7	5.6
Other food	8.4	8.1	7.7
Beverages	11.6	11.3	11.1
Tobacco products	9.5	9.0	8.6
Textile products	-11.3	-12.4	-12.8
Clothing	3.3	2.8	2.6
Wood products	1.5	1.0	1.0
Paper and paper products	1.2	0.7	0.4
Printing	5.9	5.6	5.3
Coke, oil refinery, chemicals	3.6	3.0	3.0
Rubber and plastics	2.9	2.4	2.2
Other non-metallic minerals	2.9	2.7	2.5
Machinery and equipment	0.2	-0.1	-0.2
Furniture and other products	6.2	5.7	5.4
Electricity, gas and water distribution	5.7	5.3	5.0
Construction	3.9	3.9	3.8
Hotels and restaurants	9.9	9.5	9.1
Transport and warehousing	5.7	5.2	4.8
Communication	11.6	11.1	10.6
Financial activities	9.6	9.0	8.6
Real estate transactions	9.7	9.0	8.5
Computers and related activities	6.0	5.7	5.5
Other commercial services	8.3	7.8	7.5
Governmental services	7.2	7.2	7.0

Source: authors' calculations based on CGE model.

Increase in consumption and imports will result in higher governmental revenues, however not very important (0.3% to 1.3% for different scenarios) due to the structure and taxation scheme of consumption and imports (Table 1).

DIRECT VS. INDIRECT EFFECTS OF GROWTH IN REMITTANCE

At the first sight the welfare impact of the remittances is distributed differently across the households groups (with high standard deviation), four of them (households of small farmers, large farmers, other rural and other urban households) benefitting the most and register over 10% increase in welfare. However, final (general equilibrium effects) of higher remittances are more equal across the household groups (with standard deviation twice lower) (Table 5).

TABLE 5. CGE SIMULATION RESULTS: EQUIVALENT VARIATION BY HOUSEHOLD GROUPS

Household type	REMIT1	REMIT2	REMIT3
Pensioner	6.9	6.5	5.9
Public employee in urban areas	6.0	5.4	4.9
Public employee in village	4.6	4.3	4.0
Smallholder	9.1	8.7	8.3
Professional farmer	4.3	4.1	4.0
Rest big cities	8.4	7.6	7.0
Rest towns	6.5	6.1	5.8
Rest villages	4.2	4.0	3.8

Source: authors' calculations based on CGE model.

TABLE 6: CGE SIMULATION RESULTS: PRICE OF FACTOR F, % CHANGE FROM BASE SCENARIO

	REMIT1	REMIT2	REMIT3
Low-skilled labour force	2.6	16.7	17.0
Medium-skilled labour force	2.9	2.4	2.0
High-skilled labour force	4.9	4.5	3.9
Capital	5.1	4.4	4.0
Self-employed in agriculture	3.3	3.5	14.0
Self-employed in other sectors	4.9	4.3	3.5

Source: authors' calculations based on CGE model.

Factor wages also change due to less labour force available (especially for low-skilled labour force and agricultural workers modeled in REMIT2 and REMIT3 scenarios) and increase in reservation wage (Source: authors' calculations based on CGE model.

Table 6).

MAIN CONCLUSIONS

In December 2010 Moldova and EU signed the Action Plan on Visa Liberalization. This is an important step towards European integration giving much credit to the Moldovan Government. Although the Government is speaking mainly of visa-free travel that is actually being negotiated with EU, it is aware that many Moldovan citizens think of the opportunity to migrate with labour purposes. This is possible as the migration costs will decrease significantly and the decision on migration may be much easier to take when potential migrants have the certainty that they can go back to Moldova if they do not have a job and they can return to EU whenever they wish.

Despite the importance of the topic and eagerness of negotiations no much research was conducted on the possible economic effects of such a regime, except the increase in remittances that may stimulate consumption and depletion of human capital in Moldova that is going to leave.

However, there are much deeper correlations and the economic impact may be very different from expected. In this paper we model general equilibrium effects of a visa free regime assuming that the number of emigrants will increase, but not tremendously as:

- The number of potential migrants is decreasing according to some surveys. Also, visa-free regime does not offer the right to work, but only the right to travel.
- A re-orientation of migrants from CIS to EU countries is possible. Currently, many migrants are leaving to CIS due to visa-free regime and lower emigration costs. However, some of them save money for the subsequent migration to EU, where they expect higher income.
- Decrease in illegal migration. Currently individuals leaving to EU overstay their visa duration even in case of the lack of job in European countries due to the difficulties related to visa application procedures. Visa exemption may motivate migrants without a job to return home and leave back to EU when there are jobs available.

Based on these expectations we simulate CGE model for three possible scenarios:

- Increase only in remittances by 20%, with no changes in labour force.
- Increase in remittances by 20% and decrease in low-skilled labour force by 10%.
- Increase in remittances by 20%, decrease in low-skilled labour force by 10%, decrease in small-scale agriculture labour force by 10% and increase in productivity in small scale agriculture by 5%.

General equilibrium effects confirm the expectation of rising consumption stimulated by higher remittances. However, it might seem surprisingly, but this does not result in GDP growth. On contrary, the GDP declines in two of the scenarios where we account for changes in labour force. The increase in foreign currency inflows (remittances), keeping

other factors stable will lead to national currency appreciation (6%-7% appreciation), making Moldovan exports more expensive and less competitive. These are expected to decrease by 13%-15% determining a further GDP decline (up to 1.3%). Thus, the output in economic exports-oriented sectors will decrease (textiles, clothing, machinery and equipment, chemicals), while the output in the domestic-oriented economic sectors (most foodstuffs and services) will increase due to higher internal demand. The same is valid for the imports: those designated for final consumption will increase, while exports that serve as intermediary goods for export production will fall.

Increase in consumption and imports will raise governmental revenues, but not significantly (0.3%-1.3%). Other positive impact may be on the factor wages that will increase due to less labour force available (especially for low-skilled labour force and agricultural workers modeled in two scenarios) and increase in reservation wage.

Thus, in case of flexible exchange rate, the increase in remittances (that are already around 1/3rd of GDP) will lead to a strong appreciation of Moldovan currency determining the specified impact. However, despite the flexible exchange rate regime, the NBM has often intervened in its foreign-exchange policy in order to avoid excessive fluctuation of exchange rate. Thus, the effects of such a regime will be definitely lower than the results generated by the flexible-exchange rate scenarios (strong appreciation, decrease in exports, decrease in output and GDP decline).

However, the bottom-line conclusion of the simulations undertaken using the Moldovan CGE model is that increase in remittances and decline in labor force may eventually undermine the country's international competitiveness. A short-sighted government carrying only of replenishing state's coffers by taxing consumption may be quite satisfied by the remittances increasing even more. However, this would go completely against the declared purpose of changing the current model of economic growth which is driven by consumption with a model which has been described as an investment-based, innovation-driven and export-oriented model.

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