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RESUMO/ABSTRACT

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The poverty effect of remittance flows: evidence from Georgia*

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Abstract

The main purpose of this study is to analyze the poverty effects of emigration and inward remittance flows through direct and indirect channels within the context of a standard computable general equilibrium (CGE) model. For that purpose, we use a novel approach in modeling a social accounting matrix (SAM) based CGE model by combining a novel and original data set, containing rich, highly-disaggregated household budget surveys with detailed macro-level data for Georgia. A distinctive contribution of this study is the attention paid to regional differences in terms of market access and transaction costs, in addition to households' factor endowments and consumption patterns. The main questions of interest are if and to what extent remittance flows contribute to the production and consumption pattern of the poor. Two aspects of poverty reduction are emphasized: (1) the impact of remittances on the aggregate and sectoral economic growth; and (2) the impact of remittances on poor households, their production and consumption patterns across regions. The study concludes that while having a strong macroeconomic growth effect at the aggregate level, emigration and inward remittance flows do not affect all sectors and residents symmetrically. Moreover, they have a rather limited impact in terms of poverty and income inequality.

1. Introduction

Poverty reduction is a policy priority important at both national and international levels, as stressed in the Millennium Development Goals (MDG). This calls for a careful consideration of issues involved in poverty reduction as well as adequate methodological tools for analyzing, understanding and reducing poverty. One of the most interesting issues in this context is the poverty effect of remittance flows in the low-income countries of the New Independent States (NIS) in the former Soviet Union (fSU). These countries recently have experienced large inflows of remittances, on the one hand, and an increase in poverty and inequality incidence, on the other. For example, 9 of these countries are classified nowadays as low-income countries where the size of population groups with incomes falling below the average level is large (Simai 2006). At the same time, officially recorded remittances to this region increased substantially, making about 10% of remittances received by developing countries overall (Quillin, Segni, Sirtaine and Skamnelos 2007). Since most of the fSU countries committed to reduce poverty incidence and eliminate extreme poverty by 2015 under the MDG, it is important to understand whether and how remittance flows can contribute to the implementation of poverty reduction strategies.

The poverty implication of remittance flows in the NIS has received excruciatingly little attention in the literature so far. This stems from a number of limitations intrinsic to the context of the post-communist countries. Namely, the phenomenon itself is relatively new in these countries. Besides complex issues associated with the lack of adequate methodological tools as well as data for analyzing irregular migration, pervasive market imperfections with informal relations and kinship networks cause difficulties in analyzing the phenomenon very carefully. For example, under market imperfections, as mentioned by Stiglitz (1994), the standard Arrow-Debreu macroeconomic model with a complete set of markets and optimizing agents does not admittedly fully explain the economic issues under question. In addition, data required at a

reasonable level of disaggregation are beyond the statistical coverage in most of these countries. The main purpose of this study is to analyze the poverty implications of emigration and inward remittance flows through direct and indirect channels within the context of a computable general equilibrium (CGE) model.

This study focuses on Georgia, a small country in the fSU block that has seen a significant outflow of migrants due to political and economic instability and, at the same time, a large inflow of foreign currency recently. Accumulated net migration from the beginning of the 1990s to 2006 exceeded 880 thousand individuals (with some return migrants in 2004 and 2005).¹ Inward remittances to Georgia amounted to more than US\$ 800 million in 2006, equivalent to about 10.2% of GDP and 72.0% of the incoming foreign direct investments (US\$ 1 100 million). The size of unofficial remittances is also large, consisting about US\$ 315 million or 39.4% of the total amount of remittances.² 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 the human development index in 2006. In addition to large out-migration, inward remittance and poverty issues, informal networks and kinship determine the household access to credit and capital assests in this country.

Taking into account regional differences in terms of market access and transaction costs across various household groups in Georgia; our study sheds new light on how remittances impact on households' factor endowments and consumption patterns. The main questions of interest are if and to what extent remittance flows contribute to the production and consumption patterns of the poor. Two aspects of poverty reduction are emphasized in this study: (1) the impact of remittances on the aggregated and sectoral economic growth; and (2) the impact of

¹Statistical Yearbook of Georgia, 2007.

²Georgian-European Policy and Legal Advice Centre (GEPLAC): Georgian Economic Trends, Quarterly Economic Trends 8 (see October, 2007 and February, 2008 issues).

remittances on poor households, and their production and consumption patterns across regions. For this purpose, we use a novel approach, a social accounting matrix (SAM) based CGE model that incorporates regional differences in terms of market access and transaction costs, household factor endowment and consumption pattern. We account for regional differences by disaggregating small agricultural enterprises according to geographical location and distance from the capital city.

Our SAM combines information from input-output tables, national income and product accounts, labor force statistics, fiscal statistics and highly-disaggregated micro-level data on household surveys. In this respect, this study covers the unique databases for Georgia, including highly disaggregated micro-level raw data on household budget surveys, the national accounts with the input-output transactions table, detailed balance of payments and annual report on household surveys³ for 2004. The Georgian micro-level household surveys were conducted on 3551 households inhabiting in 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-I*” for households income from employment and self-employment which are used in this study.⁴ The source of the data is the State Department for Statistics of Georgia (SDSG).

2. General macroeconomic and institutional environment in Georgia

Georgia is a relatively small and mountainous country with population of 4.5 million and area of 69.7 thousands sq. km. The topographical features of its territory are very contrasting and include the Great Caucasian chain (5068 m. above the sea level), the medium height mountains

³ SDSG: “Households of Georgia”, 2003-2004

⁴ *Shinda* stands for the Georgian abbreviation of households observation (see State Department for Statistics of Georgia: “Households of Georgia, 2003-2004”).

(about 3000 m.) 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 are 12 regions in the country including a capital region (*Tbilisi*), two autonomous republics and 9 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 1, Appendix), shows that industry and service activities are concentrated mostly in the capital city *Tbilisi* and few other regions located predominantly at the inner lowlands (e.g. Region 4). Agriculture, which is more widespread across the regions, plays a crucially important role as a source of production and employment. It accounts for about 21% in 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 originated in the external as well as internal sources of instability (Figure 1, Appendix). For example, a slowdown in the economic growth rates, from 11.7% in 2003 to 7.5% in 2006 at the annual basis, stems from the trade embargo imposed by Russia on Georgia in 2005 and 2006, as well as political instability and inflation factors within the country. According to the annual reports of the central bank of Georgia, the large sizes of current account (1.2 billion USD) and trade (2.0 billion USD) deficits in 2006 are originated in the fall of exports, following the Russian trade embargo, and high prices of imported mineral products, which have amplified inflation to 9% in 2006 relative to the 2000-2002 average rate of 5%. Additional inflation factors are the large inward remittances and capital flows in foreign currency since, under underdeveloped domestic capital markets, the central bank has limited capacity to sustain large sterilized interventions. In addition to this, frequent changes in the domestic policy regimes and political instability under weak domestic institutions cause additional shakiness in the economy.

The local market conditions and institutions are characterized by fragmented labor and credit markets, while poverty incidence is large. The poverty situation of Georgia can be characterized based on household surveys conducted on the sample of 6754 respondents. Three categories of households are distinguished in this study for this purpose. These are: 1) the group of poor households with monthly incomes less than 75 georgian lari (GEL);⁵ 2) the group of middle income households with incomes varying from 76 GEL and 200 GEL; and households, whose income exceeds 200 GEL, are assumed in this study as rich ones. According to the country-wide data, the share of households living below the poverty line is very large (about 43%) in total number of households. Rural areas have a higher poverty incidence (52%) than the urban ones (35%).

The poverty profile of household groups by major economic activities (Figure 2, Appendix) is further analyzed in terms of a head count ratio calculated within each group. Self-employed and workers involved in family business enterprises and farms have the highest poverty incidence (about 70%), followed by wage employed. One has to remark that the share of self-employed workers is very large in the economy of Georgia, composing about 50% of the economically active population. Private employers have the lowest poverty incidence of less than 10%. A comparison of regions in terms of individual household incomes reveals a large divergence in intra-regional poverty (Table 2 and Figure 3, Appendix). According to Table 2, the median level of household incomes, for example, is lower than the mean of all regions. Moreover, both median and mean levels vary substantially from one region to another, e.g. from 53 GEL and 74 GEL in Region 7 (*Adjara*) to 132 GEL and 177 in Region 2 (*Tbilisi*), respectively.

⁵This threshold is chosen because it corresponds to the minimum substance level (75 GEL) in Georgia (see SDSG: Statistical Yearbook of Georgia for 2006).

From the standard deviation values and the shapes of income distributions, one can observe that differences in terms of poverty gaps are also very large. Due to a high poverty incidence as well as fragmented credit and labor markets, commercial banks are reluctant to extend loans to clients with low incomes whose land and assets are considered inadequate collateral. In addition, capital markets and pension fund systems are underdeveloped, while the insurance market is very small (0.3% of GDP). As a result, poor members of the society, especially regions far from the capital, have limited or no access to credit markets as well as employment opportunities. As a result, households tend to borrow funds from relatives, friends (or other households) through personal contacts, instead of financial institutions and banks (Figure 4, Appendix). Moreover, the size of the borrowed funds varies largely by regions, implying a very limited or no access to these funds in some regions (e.g. Region 4, 5, 7 and 10). Presumably, access to credit and other assets in this country is determined mainly by informal networks and kinship.

Taking into account the above-mentioned features of the Georgian household sector, the direct and indirect channels between remittance flows and households well-being receive a major emphasis in this study. The main questions of interest are whether and to what extent the poor households groups, which have different access to markets, can benefit from larger inward remittance flows. The diversity among household groups is incorporated through regional differences in terms of transaction costs and market margins between different locations. In this respect, we use a novel approach in a modified CGE model which incorporates regional differences in terms market access and transaction costs, in addition to households' factor endowments and consumption patterns, which have been reported so far elsewhere. In order to enable the regional dimension of the market access and transaction costs, we disaggregated the small agricultural enterprises into three groups of regions in SAM. In particular, three types of

household farms with the highest poverty incidence are distinguished in the model, depending on their geographical location in regions with high- medium- and low-transaction costs.⁶

3. Literature review

Earlier studies focused on the poverty implications of various economic issues in developing countries and used empirical methods, typically, econometric techniques and standard SAM based CGE models (e.g. Barham and Boucher 1998; Carrington, Detragiache and Vishwanath 1996; Docquier and Rapoport 2003; Holden, Taylor and Hampton 1998; Holden, Shiferaw and Pender 2001; Milanovic 1987). From a methodological point of view, most of these studies dealing with the poverty issues tend to favor the CGE approach since it allows one to capture general equilibrium effects. In particular, Holden, Taylor and Hampton (1998) stress that when households are highly diversified within a country, remittances increase the differentiation of households further and facilitate market based exchanges among them. Subsequently, the general equilibrium effects of remittances are strong because of high transaction costs among highly diversified households, which rationalize using the CGE framework. The econometric techniques methods, on the other hand, are criticized on the grounds that they lack a clear theoretical foundation and the necessary micro-level data at a highly disaggregated level (see e.g. Azis 2002).

Three generations of CGE models have been widely used so far for analyzing the various aspects of poverty issues. The first and second generation models, for example, incorporate the distributional questions of trade and tax policies. They do not address, however, poverty issues explicitly. The third generation models incorporate interdependence among labor markets in the rural and urban sectors and, thus, allow assessing the poverty impacts more explicitly (Khan 2007). Therefore, the third approach, i.e. the SAM based general equilibrium approach that

⁶ The grouping of regions is based on the topographical features of the country's territory.

incorporates detailed interactions within and between household groups, as well as differences in terms of market access, is recognized to be an adequate tool for analyzing the phenomenon more clearly.

The nature of local markets and the conditions affecting the market access of various household types determine the pattern and magnitude of the poverty effects caused by remittance flows (Adhikari 1992). Models which enable one to account for detailed interactions between household types are often referred to in the literature as village economy SAM based CGE models (e.g. Taniguchi 2003). The main drawback of these models lies, however, in the necessity to use highly disaggregated data (at the level of a single village) which are usually unavailable. For these reasons, only a limited number of studies have managed so far to incorporate such a detailed dataset within a CGE framework, as demonstrated e.g. in Adelman, Taylor and Vogel (1988), who analyzed the impact of remittances on the rural household sector in the Mexican economy. Due to difficulties associated with disaggregating the SAM, in this respect, most studies focused on regional models (e.g. Khan 2007), integrating fully and partially regionalized SAMs into the CGE framework.

Recent studies carried out in the framework of regionalized CGE models found that the magnitude and nature of the impact caused by remittance flows on poverty, income distribution and economic development depends on different factors. The latter include the size of remittance inflows, the type of out-migration, and the distribution of factor endowment within countries (Quibria 1997). Furthermore, emigration and remittance flows to a country do not affect all residents symmetrically. For example, it is found that in the urban areas remittances contribute to the increase of household incomes and consumption smoothing (Kannan and Hari 2002), saving and asset accumulation (Hadi 1999), and access to health services (Yang 2003). In the rural areas, the impact can be two-fold depending on whether and how households are involved

into the internal and international remittance processes. Xiaoping, Heerink, Holden and Futian (2005) suggest that if rural households receive remittance incomes directly from their migrant family members, then they substantially decrease their farm activities in favor of market related ones (e.g. hiring labor, production and lending). This eventually changes the resource allocation and aggregate welfare, improving largely the number of commercial transactions at markets. Under market imperfections, however, the impact of remittance inflows on the local market conditions as well as farm activities can be negligible or even negative. This is because the overall incentives of farms to land conservation activities decrease substantially. Therefore, since land conservation activities are labor intensive and farm family members leave for market activities, labor in farms is not easily substitutable by hired labor (Thapa 2003).

The above-mentioned studies suggest that the diversity of household groups in terms of location and access to various markets and resource opportunities needs to be taken into careful consideration when analyzing the poverty implication of remittances. Differences in terms of transaction costs and market margins between different locations usually take into account such diversity among households. In this respect, given market imperfections and limited statistical coverage in data on Georgia, this study analyzes the macroeconomic implications of remittance flows, in terms of poverty reduction, through direct and indirect causal channels. The main questions of interest are whether and to what extent remittance flows contribute 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 economic growth; and (2) the impact of remittances on the poor households, their production and consumption patterns across regions. Particular attention is paid to regional differences in terms of market access and transaction costs, apart from households' factor endowments and consumption patterns reported elsewhere.

4. The building blocks of the CGE model

The CGE model used in this paper is neo-classical in spirit and integrates all the standard characteristics of a small developing country under Armington's (1969) assumptions. To be more specific, products traded internationally are assumed to be differentiated by their country of origin. In addition, the products of industries, which come from different countries, are considered imperfect substitutes for each other. These assumptions are introduced by accommodating a cross-hauling phenomenon that is widely observed in bilateral trade statistics. That is, when a country exports and imports the product of a certain industry simultaneously, the product differentiation and imperfect substitution assumptions make the existing trade statistics usable. Moreover, the elasticity of substitution within the groups of products is assumed to be constant. Such assumption simplifies the parameterization of the model, as it was recognized in many recent empirical studies (see. e.g. Zhang 2006).

Following Lofgren, Harris and Robinson (2002), the specification of our CGE model incorporates specific features particularly important in developing countries.⁷ These are market imperfections (e.g. household consumption of non-marketed "home" commodities), transaction costs for commodities, and separation between production activities and commodities. Such a separation permits any activity to produce multiple commodities and any commodity to be produced by multiple activities. The model is implemented in the General Algebraic Modeling System (GAMS) software. The mathematical model is provided by a set of simultaneous nonlinear equations grouped according to the building blocks which include: production, activities and factor markets; institutions; commodity markets; and macroeconomic balances (Tables 3, 4 in Appendix). The main basic characteristics of these blocks are provided below.

⁷ These importance features have been modeled so far within the framework of a neoclassical-structuralist approach in modeling CGEM (see e.g. Dervis, Melo and Robinson 1982).

Production and consumption decisions are driven by profits and utility maximization problems, respectively. The equations also include a set of constraints which cover markets for factors, commodities and macroeconomic aggregates including balances for savings, investment, the government, and the current account of the rest of the world. Producers are represented by a range of activities, each maximizing profits subject to a production technology. Profits are defined as the difference between the revenue earned and the cost of factors and intermediate inputs. The technology is specified by a constant elasticity of substitution (CES) function and a Leontief function of the value-added and aggregate intermediate input. As a part of profit-maximizing decision, each activity uses a set of factors up to the point where the marginal revenue product of each factor is equal to its factor price.

Institutions are represented by households, enterprises, the government, and the rest of the world. Households earn incomes on production factors, receive domestic institutional transfers, as well as remittances and transfers from the rest of the world. Households pay direct taxes and make transfers to other institutions. The consumption of market and home-produced commodities by households is allocated according to linear expenditure system (LES) demand functions. Enterprises do not consume and distribute their incomes to direct taxes, savings, and transfers. The government income consists of taxes and institutional transfers, while expenditures are composed by government purchases, consumption and transfers. The final institution is the rest of the world and the current account deficit is the difference between foreign currency spending and receipts.

The commodity sector consists of home-consumed output, domestic output and imported goods. Domestic output is aggregated from different activities which are imperfectly substitutable due to differences in timing, quality and distance between production locations.⁸

⁸ The CES function is used as the aggregate function.

The demand system for the output is derived from a cost minimization problem. Prices are activity specific and markets clear for each disaggregated commodity. The aggregated domestic output is distributed between exports and domestic sales.⁹ The domestic demand system is composed of the demands for household consumption, investment, government consumption, intermediate inputs, trade and transportation. Demand at each of these levels is derived from the cost minimization problem subject to imperfect substitutability, captured by a CES aggregation function. The demand for imported goods is equilibrated by the supply of exporters, which are infinitely elastic at given world prices. Since import prices include import tariffs and transactions costs per import unit, the derived demand for domestic output is equilibrated by domestic supply through flexible prices. The degree of interdependence between the domestic and world prices is captured by two important assumptions: imperfect transformability between exports and the domestic sales of domestic output and imperfect substitutability between imports and domestically sold domestic output. Macroeconomic balances in the model include the government balance, current account balance, and the saving-investment balance.

5. The SAM based CGEM with regional differences: data calibration and simulation results

The SAM maps production and distribution at the aggregate level and summarizes succinctly the interdependence between productive activities, factor prices, household income distribution, balance of payments, capital accounts. Given the technical conditions of production, the value added is distributed to the factors of production. Then, accrued by these factors, it further flows to households along with the ownership structure of assets and wages. The SAM

⁹ Suppliers maximize sales revenue for any given aggregate output level, subject to imperfect transformability between exports and domestic sales, expressed by a constant elasticity of transformation (CET) function.

represents, therefore, the matrix of equal rows (receipts) and columns (expenditures), as of accounting constraint. The Georgian aggregated SAM (Table 5, Appendix), which is based on the standard approach of International Food Policy Research Institute (IFPRI),¹⁰ is constructed first 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 units. Labor is split to high, medium and low-skill components using the sub-classification of employed by major work positions.

As mentioned, the original SAM has been modified in this study by disaggregating the small agricultural enterprises into three groups of regions in order to enable the regional dimension of the market access and transaction costs.¹¹ 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, which have the highest poverty incidence, are distinguished in the model. These are the household farms 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 of the territory are considered to have high-transaction costs, while regions with small cities and arable land incur medium-transaction costs. The capital

¹⁰ For an overview over the main CGE modeling approaches with references to appropriate literature, see Robinson (2003). For a detailed description of the IFPRI standard model see Lofgren et al. (2002).

¹¹ The disaggregated SAM is presented in Table 8 (in Appendix).

city with its surroundings is assumed to be in a low-transaction cost area. The regional disaggregation of small agricultural enterprises into three groups by transaction costs and household groups in SAM is presented in (Table 6, Appendix). Clearly, urban households face lower transaction costs with about 88% of their production activities concentrated in the regions with low and medium transaction costs, while about 40% of production activities, into which rural households are involved, 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 SAM. Therefore, taking into account income levels, the households of Georgia are classified into six groups: rural-rich, rural-middle income, rural-poor, urban-rich, urban-middle income, and urban-poor.

Five illustrative scenarios are simulated, including: 1) a base run; 2) a decrease in total factor productivity (TFP) by 20%; 3) a reduction in remittances by 70%; 4) an increase in labor supply by 20%; and 5) the combined effect of the remittance, labor supply and TFP effects. These scenarios describe what the Georgian economy would have looked like in 2004 without labor migration and remittances. The first simulation hypothetically eliminates the growth of TFP. The second and third scenarios demonstrate the impact of a large decrease in remittances and an increase in domestic labor supply. These two scenarios are combined in the fourth simulation and the fifth simulation adds lower TFP. As demonstrated in Table 7 (Appendix), 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 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. The growth rates of these variables in a hypothetical economy in the absence of migration and remittances in 2004 would be lower by 24.7%, 13.6% and 13.3%, correspondingly.

At the level of individual sectors, a simulated increase 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 of 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 substantially their farm activities and 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 has a negative impact on the electricity sector (-0.8%). The impact on the remaining sectors is negligible. The combined effect of remittance inflows and emigration is strongest in small-scale agriculture sector. In particular, 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 in output by about 14.3%.

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 household groups. In the urban areas, remittances contribute to the increase of household incomes and consumption smoothing, while in the rural areas the effect is positive, but rather weak. For example, the groups of rural poor and middle-income households can benefit of 1% in their private consumption each, while in urban areas these groups gain 7.4% and 5.0%, correspondingly. One can also observe that the magnitude of this impact is smaller compared to that of 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, remittances are beneficial to the wealthier members of this society (i.e. rich households) in both urban and rural areas. An increase in the supply of labor by 20%, on the contrary, would improve the welfare state of households in all groups, especially, of the rural poor at the outset. These households would benefit a 16% increase in private consumption under better access to labor markets. The effect of labor supply is smallest on rich urban households (about 9% of private consumption).

6. Conclusion

This paper presents a novel SAM based CGE model combining original rich, highly-disaggregated household budget surveys with macro-level data for Georgia. The model takes into account regional differences in terms of market access and transaction costs across various household groups, in addition to households' factor endowments and consumption. The main question of interest is whether remittance flows contribute to the production and consumption pattern of the poor with the emphasis on two aspects of poverty reduction. The first aspect is the impact of remittances on the aggregate and sectoral economic growth. The second is the impact of remittances on the poor households, their production and consumption patterns across regions.

The conclusions to be drawn from this study are that, while having a strong macroeconomic growth effect at the aggregate level, emigration and inward remittance flows do not affect all sectors and residents symmetrically. Moreover, they have a rather limited impact in terms of poverty and income inequality. In urban areas, for example, remittances contribute to the increase of household incomes 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 opposite. Presumably, the moderate level of transaction costs allow these farmers to shift from the farm related activities to market ones, once they have access to remittances. 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 incur 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 state of many, especially, of the rural poor at the outset.

Policy priorities, in these circumstances, should be given to a pro-poor approach, especially, in improving institutional mechanisms through which the poor households 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, policy can be designed for meeting the needs of household farmers in distant regions. This would include also enabling various possibilities for linking remittance flows with the microfinance based mechanisms focused on promoting saving, insurance and investment within regions, as well as decreasing transaction costs across the regions.

Appendix

Table 1. The regions and main activities of Georgia (%)

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

Source: SDSG (2004)

Table 2. Distribution of individual labor incomes by regions in 2004 (GEL)

	Reg. 1	Reg. 2	Reg.3	Reg.4	Reg. 5	Reg. 6	Reg. 7	Reg. 8	Reg. 9	Reg. 10
Maximum	1 054	2 000	500	950	767	3 000	600	1 000	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 authors' calculations

Table 3. Mathematical summary for the standard CGEM

	Sets
$\alpha \in A$ $\alpha \in ACES(\subset A)$ $\alpha \in ALEO(\subset A)$ $c \in C$ $c \in CD(\subset C)$ $c \in CDN(\subset C)$ $c \in CE(\subset C)$ $c \in CEN(\subset C)$ $c \in CM(\subset C)$ $c \in CMN(\subset C)$ $c \in CX(\subset C)$ $f \in F$ $i \in INS$ $i \in INS(\subset INS)$ $i \in INSDNG$ $(\subset INSD)$ $h \in H(\subset$ $INSDNG)$ $CINV(\subset C)$ $CT(\subset C)$ $CTD(\subset AC)$ $CTE(\subset AC)$ $CTM(\subset AC)$ $AAGR(\subset A)$ $ANAGR(\subset A)$ $CAGR(\subset C)$ $CNAGR(\subset C)$ $EN(\subset INSDNG)$ $FLAB(\subset F)$ $FLND(\subset F)$ $FCAP(\subset F)$ $FSELF(\subset F)$	<p>Model sets:</p> <p>activities</p> <p>activities with a CES function at the top of the technology nest</p> <p>activities with a Leontief function at the top of the technology nest</p> <p>commodities</p> <p>commodities with domestic sales of domestic output</p> <p>commodities without domestic sales of output</p> <p>exported commodities</p> <p>non-exported commodities</p> <p>imported commodities</p> <p>non-imported commodities</p> <p>commodities with output</p> <p>factors</p> <p>institutions (domestic and rest of the world)</p> <p>domestic institutions</p> <p>domestic nongovernment institutions</p> <p>households</p> <p>Calibration sets:</p> <p>fixed investment goods</p> <p>transaction service commodities</p> <p>domestic transactions cost account</p> <p>export transactions cost account</p> <p>import transactions cost account</p> <p>Report sets:</p> <p>agricultural activities</p> <p>non-agricultural activities</p> <p>agricultural commodities</p> <p>non-agricultural commodities</p> <p>enterprises</p> <p>labor</p> <p>land</p> <p>capital</p> <p>self-employed</p>
	Parameters (appearing in model equations)
α_a^a α_a^{ac} α_c^q α_c^t α_a^{va} $\beta_{a,c,h}^h$ $\beta_{c,h}^m$ $cwts_c$	<p>efficiency parameter in the CES activity function</p> <p>shift parameter for domestic commodity aggregation function</p> <p>shift parameter for Armington function</p> <p>shift parameter for CET function</p> <p>efficiency parameter in the CES value-added function</p> <p>marginal share of consumption spending on home commodity c from activity a for household h</p> <p>marginal share of consumption spending on marketed commodity c for household h</p> <p>consumer price index weights</p> <p>weight of commodity c in the CPI</p>

δ_a^a	CES activity function share parameter
δ_{ac}^{ac}	share parameter for domestic commodity aggregation function
δ_c^q	share parameter for Armington function
δ_c^t	share parameter for CET function
δ_{fa}^{va}	share parameter for CES activity production function
$dwts_c$	domestic sales price weights
$\gamma_{a,c,h}^b$	subsistent consumption of home commodity c from activity a for household h
$\gamma_{c,h}^n$	subsistent consumption of marketed commodity c for household h
ica_{ca}	quantity of c as intermediate input per unit of activity a
$inta_a$	aggregate intermediate input coefficient
iva_a	quantity of value-added per activity unit
$icd_{cc'}$	trade input of c per unit of commodity c' produced and sold domestically
$ice_{cc'}$	trade input of c per unit of commodity c' exported
$icm_{cc'}$	trade input of c per unit of commodity c' imported
$mps0I_c$	0-1 parameter with 1 for institutions with potentially flexed direct tax rates
mpc_i	base saving rate for domestic institution INS
$qdst_c$	quantity of stock exchange
qg_c	base-year quantity of government demand
$qinv_c$	base-year quantity of private investment demand
ρ_a^a	CES production function exponent
ρ_c^{ac}	domestic commodity aggregation function exponent
ρ_c^q	Armington function exponent
ρ_c^t	CET function exponent
ρ_a^{va}	CES activity production function exponent
$shif_{if}$	share of domestic institution i in income of factor f
$shii_{ii'}$	share of net income of i' to i ($i' \in INSDNG'$, $i \in INSDNG$)
$supernum^H$	LES supernumerary income
θ_{ac}	yield of commodity c per unit of activity a
$tins0I_i$	0-1 parameter with 1 for institutions with potentially flexed direct tax rates
$trnsfr_{if}$	transfers from factor f to institution i
ta_α	tax rate on producer gross output value
te_c	tax rate on exports
tf_f	direct tax on factors
$tins_i$	exogenous direct tax on domestic institutions I
tm_c	rate of import tariff
tq_c	rate of sales tax
tva_a	rate of value-added tax

	Variables
<i>CPI</i>	Exogenous: consumer price index (PQ-based)
<i>DTINS</i>	change in domestic institution tax share
<i>FSAV</i>	foreign savings
<i>GADJ</i>	government demand scaling factor
<i>IADJ</i>	investment scaling factor (for fixed capital formation)
<i>MPSADJ</i>	savings rate scaling factor
<i>QFS_f</i>	quantity of factor supply
<i>TINSADJ</i>	direct tax scaling factor
<i>WFDIST_{fa}</i>	factor wage distortion variable
<i>DPI</i>	Endogenous: index for domestic producer prices (PDS-based)
<i>DMPS</i>	change in marginal propensity to save for selected institutions
<i>EG</i>	total current government expenditure
<i>EH_h</i>	household consumption expenditure
<i>EXR</i>	exchange rate
<i>GOVSHR</i>	government consumption share of absorption
<i>GSAV</i>	government savings
<i>INVSHR</i>	investment share of absorption
<i>MPS_i</i>	marginal propensity to save for domestic non-government institution
<i>PA_a</i>	output price of activity <i>a</i>
<i>PDD_c</i>	demand price for commodity <i>c</i> produced and sold domestically
<i>PDS_c</i>	supply price for commodity <i>c</i> produced and sold domestically
<i>PE_c</i>	price of exports
<i>PINTA_a</i>	price of intermediate aggregate
<i>PM_c</i>	price of imports
<i>PQ_c</i>	price of composite good <i>c</i>
<i>PVA_a</i>	value added price
<i>PWE_c</i>	world price of exports
<i>PWM_c</i>	world price of imports
<i>PX_c</i>	average output price
<i>PXAC_{a,c}</i>	price of commodity <i>c</i> from activity <i>a</i> level of domestic activity
<i>QA_a</i>	quantity of domestic sales
<i>QD_c</i>	quantity of exports
<i>QE_c</i>	quantity demanded of factor <i>f</i> from activity <i>a</i>
<i>QF_{fa}</i>	quantity of government consumption
<i>QG_c</i>	quantity consumed of marketed commodity <i>c</i> by household <i>h</i>
<i>QH_{c,h}</i>	quantity consumed of home commodity <i>c</i> from activity <i>a</i> by household <i>h</i>
<i>QHA_{a,c,h}</i>	
<i>QINT_{c,a}</i>	quantity of intermediate demand for <i>c</i> from activity <i>a</i>
<i>QINTA_a</i>	quantity of aggregate intermediate input
<i>QINV_c</i>	quantity of fixed investment demand
<i>QM_c</i>	quantity of imports
<i>QQ_c</i>	quantity of composite goods supply
<i>QT_c</i>	quantity of trade and transport demand for commodity <i>c</i>
<i>QVA_a</i>	quantity of aggregate value added
<i>QX_c</i>	quantity of aggregate marketed commodity output

$QXAC_{a,c}$	quantity of output of commodity c from activity a
$TABS$	total absorption
$TINS_i$	rate of direct tax on domestic institutions ins
$TRII_{i,i'}$	transfers to domestic institution (both in the set $INSDNG$)
$WALRAS$	savings-investment imbalance (should be zero)
$WALRASSQR$	Walras squared
WF_f	economy-wide wage (rent) for factor f
YF_f	income of factor f
YG	total current government income
YIF_{if}	income of institution ins from factor f
YI_i	income of (domestic non-governmental) institution INS

Table 4. Mathematical representation for the standard CGEM

#	Description	Equation	Domain
(1)	I. Price block domestic import price	$PM_c = pwm_c \cdot (1 + tm_c) \cdot EXR + \sum_{c' \in CT} PQ_{c'} \cdot icm_{c'c}$	$c \in CM$
(2)	domestic export price	$PE_c = pwe_c \cdot (1 - te_c) \cdot EXR - \sum_{c' \in CT} PQ_{c'} \cdot ice_{c'c}$	$c \in CE$
(3)	domestic price for commodity c produced and sold domestically	$PDD_c = PDS_c + \sum_{c' \in CT} PQ_{c'} \cdot icd_{c'c}$	$c \in CD$
(4)	value of sales in domestic market	$PQ_c \cdot (1 - tq_c) \cdot QQ^c = PDD_c \cdot QD_c + PM_c \cdot QM_c$	$C \in (CD \cup CM)$
(5)	value of marketed domestic output	$PX_c \cdot QX_c = PDS_c \cdot QD_c + PE_c \cdot QE_c$	$c \in CX$
(6)	activity price	$PA_a = \sum_{c \in C} PXAC_{ac} \cdot \theta_{ac}$	$a \in A$
(7)	aggregate intermediate input price	$PINTA_a = \sum_{c \in C} PQ_c \cdot ica_{ca}$	$a \in A$
(8)	value-added price	$PA_a \cdot (1 - ta_a) \cdot QA_a = PVA_a \cdot QVA_a + PINTA_a \cdot QINTA_a$	$a \in A$
(9)	consumer price index	$\overline{CPI} = \sum_{c \in C} PQ_c \cdot cwts_c$	
(10)	domestic producer price index	$DPI = \sum_{c \in C} PDS_c \cdot dwts_c$	
(11)	II. Production and trade block CES aggregate production function	$QA_a = \alpha_a^a \cdot \left(\delta_a^a \cdot QVA_a^{-\rho_a^a} + (1 - \delta_a^a) \cdot QINTA_a^{-\rho_a^a} \right)^{\frac{1}{\rho_a^a}}$	$a \in ACES$
(12)	CES technology: value-added intermediate-input quantity ratio	$QVA_a = QINTA_a \cdot \left(\frac{PINTA_a}{PVA_a} \cdot \frac{\delta_a^a}{1 - \delta_a^a} \right)^{\frac{1}{1 - \rho_a^a}}$	$a \in ACES$
(13)	Leontief aggregate intermediate demand	$QINTA_a = \text{int } a_a \cdot QA_a$	$a \in ALEO$
(14)	Leontief aggregate value-added demand	$QVA_a = \text{iva}_a \cdot QA_a$	$a \in ALEO$
(15)	value-added and factor demand (CES production function)	$QVA_a = \alpha_a^{va} \left(\sum_{f \in F} \delta_{fa}^{va} QF_{fa}^{-\rho_a^{va}} \right)^{-\frac{1}{\rho_a^{va}}}$	$a \in A$
(16)	factor demand (CES value-added first-order condition)	$WF_f \cdot \overline{WFDIST}_{fa} = PVA_a \cdot (1 - tva_a) \cdot QVA_a \times \left(\sum_{f \in F'} \delta_{fa}^{va} \cdot QF_{fa}^{-\rho_a^{va}} \right)^{-1} \cdot \delta_{fa}^{va} \cdot (QF_{fa})^{-\rho_a^{va}-1}$	$a \in A$ $f \in F$

(17)	disaggregated intermediate input demand	$QINT_{ca} = ica_{ca} \cdot QINTA_a$	$a \in A$ $c \in C$
(18)	commodity production and allocation	$QXAC_{ac} + \sum_{h \in H} QHA_{ach} = \theta_{ac} \cdot QA_a$	$a \in A$ $a \in CX$
(19)	output aggregation function	$QX_c = \alpha_c^{ac} \cdot \left(\sum_{a \in A} \delta_{ac}^{ac} \cdot QXAC_{ac}^{-\rho_c^{ac}} \right)^{\frac{1}{\rho_c^{ac}-1}}$	$c \in CX$
(20)	first order condition for output aggregation function	$PXAC_{ac} = PX_c \cdot QX_c \left(\sum_{a \in A} \delta_{ac}^{ac} \cdot QXAC_{ac}^{-\rho_c^{ac}} \right)^{-1} \times$ $\times \delta_{ac}^{ac} \cdot QXAC_{ac}^{-\rho_c^{ac}-1}$	$a \in A$ $a \in CX$
(21)	output transformation (CET) function	$QX^c = \alpha_c^t \cdot \left(\delta_c^t \cdot QE_c^{\rho_c^t} + (1 - \delta_c^t) \cdot QD_c^{\rho_c^t} \right)^{\frac{1}{\rho_c^t}}$	$c \in (CE \cup CD)$
(22)	export-domestic supply ratio	$\frac{QE_c}{QD_c} = \left(\frac{PE_c}{PDS_c} \cdot \frac{1 - \delta_c^t}{\delta_c^t} \right)^{\frac{1}{\rho_c^t-1}}$	$c \in (CE \cup CD)$
(23)	output transformation for non-exported commodities	$QX_c = QD_c + QE_c$	$c \in (CD \cap CEN) \cup (CE \cup CDN)$
(24)	composite commodity aggregation (Armington) function	$QQ_c = \alpha_c^q \cdot \left(\frac{\delta_c^q}{QM_c^{\rho_c^q}} + \frac{1 - \delta_c^q}{QD_c^{\rho_c^q}} \right)^{\frac{1}{\rho_c^q}}$	$c \in (CM \cap CD)$
(25)	import-domestic demand ratio	$\frac{QM_c}{QD_c} = \left(\frac{PDD_c}{PM_c} \cdot \frac{\delta_c^q}{1 - \delta_c^q} \right)^{\frac{1}{1+\rho_c^q}}$	$c \in (CM \cap CD)$
(26)	composite supply for non-imported outputs and nonproduced imports	$QQ_c = QD_c + QM_c$	$c \in (CD \cap CMN) \cup (CM \cup CDN)$
(27)	demand for transaction (trade and transport services)	$QT_c = \sum_{c' \in C} (icm_{cc'} \cdot QM_{c'} + ice_{cc'} \cdot QE_{c'} + icd_{cc'} \cdot QD_{c'})$	$c \in CT$
III. Institution block			
(28)	factor incomes	$YF_f = \sum_{a \in A} WF_f \cdot \overline{WFDIST}_{fa} \cdot QF_{fa}$	$i \in INSD$ $f \in F$
(29)	factor incomes to domestic institutions	$YIF_{if} = shif_{if} \cdot [(1 - tf_f) \cdot YF_f - trnsfr_{rowf} \cdot EXP]$	$i \in INSD$ $f \in F$

(30)	Income of domestic, nongovernment institution	$YI_i = \sum_{f \in F} YIF_{if} + \sum_{i' \in INSDNG'} TRII_{ii'} + trnsfr_{i.gov} \cdot \overline{CPI} +$ $+ trnsfr_{i.row} \cdot EXR$	$i \in INSDNG$
(31)	Intra-institutional transfer	$TRII_{ii'} = shii_{ii'} \cdot (1 - MPS_{i'}) \cdot (1 - TINS_{i'}) \cdot YI_{i'}$	$i \in INSDNG$ $i' \in INSDNG'$
(32)	Household consumption expenditure	$EH_h = \left(1 - \sum_{i \in INSDNG} shii_{ih} \right) \cdot (1 - MPS_h) \cdot (1 - TINS_h) \cdot YI_h$	$h \in H$
(33)	Household consumption demand for marketed commodities	$PQ_c \cdot QH_{ch} = PQ_c \cdot \gamma_{ch}^m + \beta_{ch}^m \times$ $\times \left(EH_h - \sum_{c' \in C} PQ_{c'} \cdot \gamma_{c'h}^m - \sum_{a \in A} \sum_{c' \in C} PXAC_{ac'} \cdot \gamma_{ac'h}^h \right)$	$c \in C$ $h \in H$
(34)	Household consumption demand for home commodities	$PXAC_{ac} \cdot QHA_{ach} = PXAC_{ac} \cdot \gamma_{ach}^h + \beta_{ach}^h \times$ $\times \left(EH_h - \sum_{c' \in C} PQ_{c'} \cdot \gamma_{c'h}^m - \sum_{a \in A} \sum_{c' \in C} PXAC_{ac'} \cdot \gamma_{ac'h}^h \right)$	$a \in A$ $c \in C$ $h \in H$
(35)	Investment demand	$QINV_c = \overline{IADJ} \cdot \overline{qinv}_c$	$c \in CINV$
(36)	Government consumption demand	$QG_c = \overline{GADJ} \cdot \overline{qg}_c$	$c \in C$
(37)	Government revenue	$YG = \sum_{i \in INSDNG} TINS_i \cdot YI_i + \sum_{f \in F} tf_f \cdot YF_f + \sum_{a \in A} tva_a \cdot PVA_a \cdot QVA_a$ $+ \sum_{a \in \lambda} ta_a \cdot PA_a \cdot QA_a + \sum_{c \in CM} tm_c \cdot pwm_c \cdot QM_c \cdot EXR +$ $+ \sum_{c \in CE} te_c \cdot pwe_c \cdot QE_c \cdot EXR + \sum_{c' \in C} tq_c \cdot PQ_c \cdot QQ_c +$ $+ \sum_{f \in F} YIF_{gov \cdot f} + trnsfr_{gov \cdot row} \cdot EXR$	
(38)	Government expenditures	$EG = \sum_{c \in C} PQ_c \cdot QG_c + \sum_{i \in INSDNG} trnsfr_{i.gov} \cdot \overline{CPI}$	
	IV. System constraint block		
(39)	Factor market	$\sum_{a \in A} QF_{fa} = \overline{QFS}_f$	$f \in F$
(40)	Composite commodity markets	$QQ_c = \sum_{a \in A} QINT_{ca} + \sum_{h \in H} QH_{ch} + QG_c + QINV_c +$ $+ qdst_c + QT_c$	$c \in C$
(41)	Current account balance for rest of the world (in foreign currency)	$\sum_{c \in CM} pwm_c \cdot QM_c + \sum_{f \in F} trnsfr_{rowf} =$	

		$= \sum_{c \in CE} pwe_c \cdot QE_c + \sum_{i \in INSD} trnsfr_{irow} + \overline{FSAV}$	
(42)	Government balance	$YG = EG + GSAV$	
(43)	Direct institutional tax rates	$TINS_i = tins_i \cdot (1 + \overline{TINSADJ} \cdot tins01_i) + \overline{DTINS} \cdot tins01_i$	i ∈ INSDNG
(44)	Institutional saving rates	$MPS_i = \overline{mps_i} \cdot (1 + \overline{MPSADJ} \cdot mps01_i) + \overline{DMPS} \cdot mps01_i$	i ∈ INSDNG

Table 5. National SAM (the aggregated version) for Georgia, 2004 (mln. GEL)

Accounts	No.	1	2	3	4	5	6	7	8	9	10	Total
Production activities	1	0	14278	0	0	582	0	0	0	0	0	14860
Commodities	2	6044	0	1429	0	5904	0	1425	0	3100	3649	21629
Transaction costs	3	0	1429	0	0	0	0	0	0	0	0	1429
Factors	4	8581	0	0	0	0	0	0	0	85	0	8666
Households	5		0	0	5998	0	0	362	0	633	0	6994
Enterprises	6	0	0	0	2095	0	0	0	0	0	0	2095
Government/NGO	7	0	0	0	61	0	0	0	2252	599	0	2912
Taxes (direct and indirect)	8	234	1104	0	0	206	709	0	0	0	0	2252
Rest of the world	9	0	4818	0	512	19	0	816	0	0	0	6164
Capital accounts	10	0	0	0	0	284	1386	309	0	1748	78	3727
Total		14860	21629	1429	8666	6994	2095	2912	2252	6164	3727	

Source: The input-output tables (SDSG)

Table 6. The distribution of small farmers by transaction costs and household groups (mln. GEL)

	Commodities in agriculture	Household								
		Total by urban and rural areas	Urban households				Rural households			
			Total	Rich	Middle income	Poor	Total	Rich	Middle income	Poor
Small agriculture 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)

Table 7. The results of SAM based CGEM simulations

Aggregated macroeconomic variables	Base run	A decrease in TFP by 20%	Reduction in remittances by 70%	An increase in labor supply by 20%	A combined effect	
1	2	3	4	5	6 (4+5)	7 (3+4+5)
	Level	Change in real terms, %				
Domestic absorption	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 consumption	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
Disaggregated macroeconomic indicators						
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 administration/ 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 households	0,9	-10,5	-1,0	15,5	14,9	-25,6
Rural middle-income households	1,5	-6,8	-0,9	10,9	10,2	-20,3
Rural rich households	1,4	-3,4	-7,8	10,5	2,6	-26,0
Urban poor households	0,6	-4,0	-7,4	11,0	3,4	-23,9
Urban middle-income households	1,2	-5,8	-5,0	11,8	6,8	-22,1
Urban rich households	1,8	2,1	-16,9	8,9	-8,6	-29

Source: the authors' estimations

Table 8. Disaggregated SAM for Georgia: 2004 (mln. GEL)

Blocks	Composits	Activities																
		No.	1	#	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Activities	Large agric and other primary	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Small-scale agriculture	#	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-in low trans. cost reg.	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-in medium trans. cost reg.	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-in high trans. cost reg.	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Manufacturing	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electricity etc. distribution	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Processing of products by households	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Trade and repair of moto. vehicles	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hotels and restaurants	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Transportation	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Communication services	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Financial, profess., other priv. services	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Public administration / NGOs	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Public services and private households	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commodities	Agriculture and other primary	16	204	336	247	29	60	244	0	594	47	3	16	16	0	1	4	3
	Manufacturing	17	76	125	103	9	13	242	33	124	429	106	30	94	2	29	95	177
	Electricity etc. distribution	18	24	40	29	4	7	236	133	40	12	47	13	130	5	21	32	66
	Processing of products by households	19	0	0	0	0	0	188	0	66	0	0	6	0	0	0	0	0
	Construction	20	1	1	0	1	0	1	1	0	20	1	1	7	1	23	6	3
	Trade and repair of moto. vehicles	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hotels and restaurants	22	7	11	3	1	7	8	5	0	17	3	4	11	7	10	4	20
	Transportation	23	9	14	10	0	4	43	3	0	55	215	3	108	1	14	20	9
	Communication services	24	2	3	1	1	1	14	6	0	22	25	2	14	70	23	12	30

	Financial, professional and other private services	25	13	9	3	1	4	48	17	5	93	79	62	42	47	58	10	75
	Public administration / NGOs	26	1	1	1	0	1	4	8	0	2	19	1	5	2	5	4	7
	Public services and private households	27	8	13	10	1	2	116	29	0	22	51	7	19	33	34	36	79
Trans. costs	Domestic sales	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exports	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Imports	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Factors	Labor		68	0	0	0	0	183	97	0	114	209	39	108	53	121	250	423
	-low skill	31	53	0	0	0	0	45	24	0	32	160	19	71	35	64	46	58
	-medium skill	32	9	0	0	0	0	84	38	0	74	24	9	24	12	20	76	85
	-high skill	33	5	0	0	0	0	55	34	0	8	25	10	13	7	37	128	280
	Capital	34	660	0	0	0	0	332	94	235	403	619	133	483	179	316	286	262
	Self-employed:		0	933	196	416	322	214	61	151	86	399	86	311	116	204	185	169
	-in agriculture	35	0	933	196	416	322	0	0	0	0	0	0	0	0	0	0	0
	-in other sectors	36	0	0	0	0	0	214	61	151	86	399	86	311	116	204	185	169
Institutions	Household	#	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Urban households:	#	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-rich	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-with middle level of incomes	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-poor	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural households:	#	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-rich	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-with middle level of incomes	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	-poor	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Enterprises	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Government/NGO	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Direct taxes	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Indirect taxes	46	14	0	0	0	0	52	45	0	9	14	6	40	32	12	0	11
	Import tariffs	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rest of the world	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Savings-investment	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stock change	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	51	1085	1487	604	463	421	1928	531	1216	1329	1791	408	1387	548	871	944	1334

(continuation)

Blocks	Composits	No.	Commodities											
			16	17	18	19	20	21	22	23	24	25	26	27
Activities	Large agric and other primary	1	1085	0	0	0	0	0	0	0	0	0	0	0
	Small-scale agriculture	#	906	0	0	0	0	0	0	0	0	0	0	0
	-in low trans. cost reg.	2	431	0	0	0	0	0	0	0	0	0	0	0
	-in medium trans. cost reg.	3	271	0	0	0	0	0	0	0	0	0	0	0
	-in high trans. cost reg.	4	203	0	0	0	0	0	0	0	0	0	0	0
	Manufacturing	5	0	1921	0	0	1	3	1	1	0	0	0	0
	Electricity etc. distribution	6	0	0	531	0	0	0	0	0	0	0	0	0
	Processing of products by households	7	0	0	0	1216	0	0	0	0	0	0	0	0
	Construction	8	0	2	175	0	1150	1	0	0	0	0	0	0
	Trade and repair of moto. vehicles	9	0	9	0	0	2	1771	1	7	0	1	0	0
	Hotels and restaurants	10	0	1	0	0	0	2	405	0	0	0	0	0
	Transportation	11	0	14	0	0	0	3	1	1369	0	0	0	0
	Communication services	12	0	0	0	0	0	0	0	0	548	0	0	0
	Financial, profess., other priv. services	13	0	8	0	0	2	10	3	12	0	833	0	3
	Public administration / NGOs	14	0	0	0	0	0	0	0	0	0	0	944	0
	Public services and private households	15	0	0	10	0	0	1	0	0	0	0	0	1322
Commodities	Agriculture and other primary	16	0	0	0	0	0	0	0	0	0	0	0	0
	Manufacturing	17	0	0	0	0	0	0	0	0	0	0	0	0
	Electricity etc. distribution	18	0	0	0	0	0	0	0	0	0	0	0	0
	Processing of products by households	19	0	0	0	0	0	0	0	0	0	0	0	0
	Construction	20	0	0	0	0	0	0	0	0	0	0	0	0
	Trade and repair of moto. vehicles	21	0	0	0	0	0	0	0	0	0	0	0	0
	Hotels and restaurants	22	0	0	0	0	0	0	0	0	0	0	0	0
	Transportation	23	0	0	0	0	0	0	0	0	0	0	0	0
	Communication services	24	0	0	0	0	0	0	0	0	0	0	0	0
	Financial, professional and other private services	25	0	0	0	0	0	0	0	0	0	0	0	0
	Public administration / NGOs	26	0	0	0	0	0	0	0	0	0	0	0	0
	Public services and private households	27	0	0	0	0	0	0	0	0	0	0	0	0

Transaction costs	Domestic sales	28	454	58	0	0	0	0	0	0	0	0	0	0
	Exports	29	116	238	0	0	0	0	0	0	0	0	0	0
	Imports	30	28	536	0	0	0	0	0	0	0	0	0	0
Factors	Labor	#	0	0	0	0	0	0	0	0	0	0	0	0
	-low skill	31	0	0	0	0	0	0	0	0	0	0	0	0
	-medium skill	32	0	0	0	0	0	0	0	0	0	0	0	0
	-high skill	33	0	0	0	0	0	0	0	0	0	0	0	0
	Capital	34	0	0	0	0	0	0	0	0	0	0	0	0
	Self-employed:		0	0	0	0	0	0	0	0	0	0	0	0
	-in agriculture	35	0	0	0	0	0	0	0	0	0	0	0	0
	-in other sectors	36	0	0	0	0	0	0	0	0	0	0	0	0
Institutions	Household	#	0	0	0	0	0	0	0	0	0	0	0	0
	Urban households:	#	0	0	0	0	0	0	0	0	0	0	0	0
	-rich	37	0	0	0	0	0	0	0	0	0	0	0	0
	-with middle level of incomes	38	0	0	0	0	0	0	0	0	0	0	0	0
	-poor	39	0	0	0	0	0	0	0	0	0	0	0	0
	Rural households:	#	0	0	0	0	0	0	0	0	0	0	0	0
	-rich	40	0	0	0	0	0	0	0	0	0	0	0	0
	-with middle level of incomes	41	0	0	0	0	0	0	0	0	0	0	0	0
	-poor	42	0	0	0	0	0	0	0	0	0	0	0	0
	Enterprises	43	0	0	0	0	0	0	0	0	0	0	0	0
	Government/NGO	44	0	0	0	0	0	0	0	0	0	0	0	0
	Direct taxes	45	0	0	0	0	0	0	0	0	0	0	0	0
	Indirect taxes	46	43	831	12	0	52	21	8	53	40	37	0	7
	Import tariffs	47	0	0	0	0	0	0	0	0	0	0	0	0
	Rest of the world	48	149	3937	381	0	14	0	56	37	39	74	86	45
	Savings-investment	49	0	0	0	0	0	0	0	0	0	0	0	0
	Stock change	50	0	0	0	0	0	0	0	0	0	0	0	0
	Total	51	2780	7556	1110	1216	1222	1812	475	1478	627	945	1030	1378

(continuation)

Blocks	Composits	No.	Transaction costs			Factors							
			28	29	30	#	31	32	33	34	#	35	36
Activities	Large agric and other primary	1	0	0	0	0	0	0	0	0	0	0	0
	Small-scale agriculture	#	0	0	0	0	0	0	0	0	0	0	0
	-in low trans. cost reg.	2	0	0	0	0	0	0	0	0	0	0	0
	-in medium trans. cost reg.	3	0	0	0	0	0	0	0	0	0	0	0
	-in high trans. cost reg.	4	0	0	0	0	0	0	0	0	0	0	0
	Manufacturing	5	0	0	0	0	0	0	0	0	0	0	0
	Electricity etc. distribution	6	0	0	0	0	0	0	0	0	0	0	0
	Processing of products by households	7	0	0	0	0	0	0	0	0	0	0	0
	Construction	8	0	0	0	0	0	0	0	0	0	0	0
	Trade and repair of moto. vehicles	9	0	0	0	0	0	0	0	0	0	0	0
	Hotels and restaurants	10	0	0	0	0	0	0	0	0	0	0	0
	Transportation	11	0	0	0	0	0	0	0	0	0	0	0
	Communication services	12	0	0	0	0	0	0	0	0	0	0	0
	Financial, profess., other priv. services	13	0	0	0	0	0	0	0	0	0	0	0
	Public administration / NGOs	14	0	0	0	0	0	0	0	0	0	0	0
	Public services and private households	15	0	0	0	0	0	0	0	0	0	0	0
Commodities	Agriculture and other primary	16	0	0	0	0	0	0	0	0	0	0	0
	Manufacturing	17	0	0	0	0	0	0	0	0	0	0	0
	Electricity etc. distribution	18	0	0	0	0	0	0	0	0	0	0	0
	Processing of products by households	19	0	0	0	0	0	0	0	0	0	0	0
	Construction	20	0	0	0	0	0	0	0	0	0	0	0
	Trade and repair of moto. vehicles	21	512	354	563	0	0	0	0	0	0	0	0
	Hotels and restaurants	22	0	0	0	0	0	0	0	0	0	0	0
	Transportation	23	0	0	0	0	0	0	0	0	0	0	0
	Communication services	24	0	0	0	0	0	0	0	0	0	0	0
	Financial, professional and other private services	25	0	0	0	0	0	0	0	0	0	0	0
	Public administration / NGOs	26	0	0	0	0	0	0	0	0	0	0	0
	Public services and private households	27	0	0	0	0	0	0	0	0	0	0	0
Transaction costs	Domestic sales	28	0	0	0	0	0	0	0	0	0	0	0
	Exports	29	0	0	0	0	0	0	0	0	0	0	0
	Imports	30	0	0	0	0	0	0	0	0	0	0	0

Factors	Labor	#	0	0	0	0	0	0	0	0	0	0	0
	-low skill	31	0	0	0	0	0	0	0	0	0	0	0
	-medium skill	32	0	0	0	0	0	0	0	0	0	0	0
	-high skill	33	0	0	0	0	0	0	0	0	0	0	0
	Capital	34	0	0	0	0	0	0	0	0	0	0	0
	Self-employed:		0	0	0	0	0	0	0	0	0	0	0
	-in agriculture	35	0	0	0	0	0	0	0	0	0	0	0
	-in other sectors	36	0	0	0	0	0	0	0	0	0	0	0
Institutions	Household	#	0	0	0	1180	527	288	365	1904	2914	933	1981
	Urban households:	#	0	0	0	847	329	217	304	1377	2125	188	1937
	-rich	37	0	0	0	121	19	36	66	1187	373	33	340
	-with middle level of incomes	38	0	0	0	328	129	100	100	131	892	79	813
	-poor	39	0	0	0	397	191	76	131	60	861	76	784
	Rural households:	#	0	0	0	334	199	72	60	526	789	745	44
	-rich	40	0	0	0	19	7	8	4	96	64	60	4
	-with middle level of incomes	41	0	0	0	101	57	31	13	396	272	256	15
	-poor	42	0	0	0	214	140	32	41	34	454	429	25
	Enterprises	43	0	0	0	0	0	0	0	2095	0	0	0
	Government/NGO	44	0	0	0	0	0	0	0	61	0	0	0
	Direct taxes	45	0	0	0	0	0	0	0	0	0	0	0
	Indirect taxes	46	0	0	0	0	0	0	0	0	0	0	0
	Import tariffs	47	0	0	0	0	0	0	0	0	0	0	0
	Rest of the world	48	0	0	0	484	80	167	237	28	0	0	0
	Savings-investment	49	0	0	0	0	0	0	0	0	0	0	0
	Stock change	50	0	0	0	0	0	0	0	0	0	0	0
	Total	51	512	354	563	1664	607	455	602	4088	2914	933	1981

(continuation)

Blocks	No.	Institutions																	Total
		#	#	37	38	39	#	40	41	42	43	44	45	46	47	48	49	50	51
Activities	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1085
		582	42	26	11	5	539	51	158	331	0	0	0	0	0	0	0	0	1487
	2	173	1	1	0	0	172	16	50	105	0	0	0	0	0	0	0	0	604
	3	192	36	22	10	5	155	15	45	95	0	0	0	0	0	0	0	0	463
	4	217	5	3	1	1	212	20	62	130	0	0	0	0	0	0	0	0	421
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1928
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	531
	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1216
	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1329
	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1791
	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	408
	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1387
	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	548
	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	871
	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	944
	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1334
Commodities	16	722	46	8	19	19	676	54	233	389	0	0	0	0	0	523	50	17	2780
	17	1195	552	97	231	223	643	52	221	370	0	0	0	0	0	1550	3186	61	7556
	18	312	244	43	102	99	67	5	23	39	0	0	0	0	0	0	0	0	1110
	19	956	837	147	351	339	119	10	41	69	0	0	0	0	0	0	0	0	1216
	20	744	502	88	211	203	242	19	83	139	0	0	0	0	0	0	413	0	1222
	21	383	180	32	76	73	203	16	70	117	0	0	0	0	0	0	0	0	1812
	22	273	231	41	97	94	42	3	14	24	0	0	0	0	0	95	0	0	475
	23	370	252	44	106	102	117	9	40	68	0	0	0	0	0	612	0	0	1478
	24	308	251	44	105	102	57	5	20	33	0	0	0	0	0	95	0	0	627
	25	253	183	32	77	74	70	6	24	40	0	52	0	0	0	82	0	0	945
	26	132	78	14	33	32	54	4	19	31	0	739	0	0	0	100	0	0	1030
	27	256	161	28	68	65	95	8	33	55	0	634	0	0	0	43	0	0	1378
Trans. costs	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	512
	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	354
	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	563
Factors		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1664
	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	607
	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	455
	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	602
	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	0	0	4088
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2914
	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	933
Institutions	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1981
		0	0	0	0	0	0	0	0	0	0	362	0	0	0	633	0	0	6994
		0	0	0	0	0	0	0	0	0	0	84	0	0	0	238	0	0	4672
	37	0	0	0	0	0	0	0	0	0	0	7	0	0	0	5	0	0	1694
	38	0	0	0	0	0	0	0	0	0	0	2	0	0	0	20	0	0	1373
	39	0	0	0	0	0	0	0	0	0	0	75	0	0	0	213	0	0	1605
		0	0	0	0	0	0	0	0	0	0	278	0	0	0	395	0	0	2322

	40	0	0	0	0	0	0	0	0	0	0	1	0	0	0	8	0	0	189
	41	0	0	0	0	0	0	0	0	0	0	9	0	0	0	15	0	0	792
	42	0	0	0	0	0	0	0	0	0	0	267	0	0	0	371	0	0	1341
	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2095
	44	0	0	0	0	0	0	0	0	0	0	0	914	1338	0	599	0	0	2912
	45	206	88	13	34	41	118	7	36	75	709	0	0	0	0	0	0	0	914
	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1338
	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	48	19	7	0	1	6	12	0	0	11	0	816	0	0	0	0	0	0	6164
	49	284	1016	1037	-149	128	-732	-61	-222	-449	1386	309	0	0	0	1748	0	0	3727
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	78	
	51	6994	4672	1694	1373	1605	2322	189	792	1341	2095	2912	914	1338	0	6164	3727	78	#

Figure 1. Real GDP growth rates in Georgia

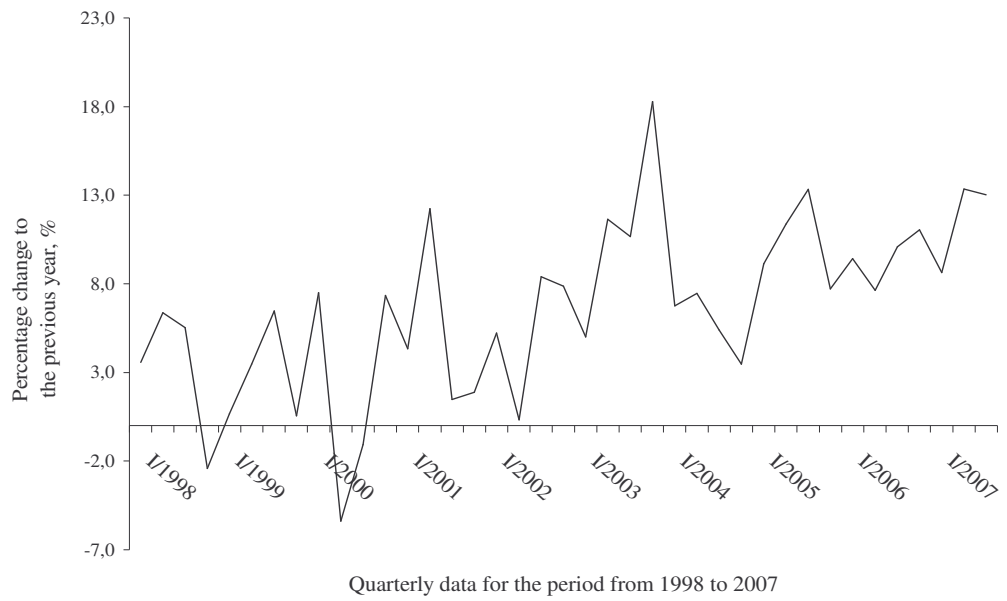


Figure 2. The distribution of households by income level

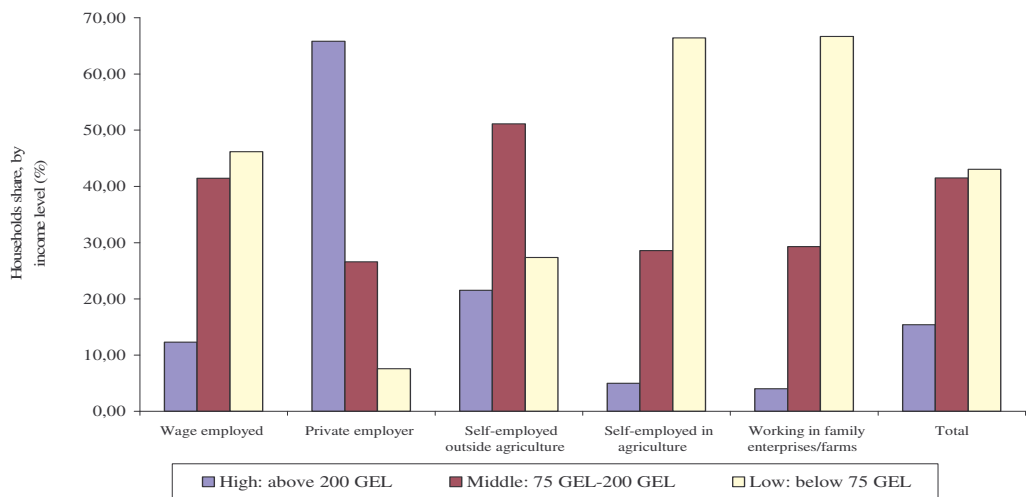
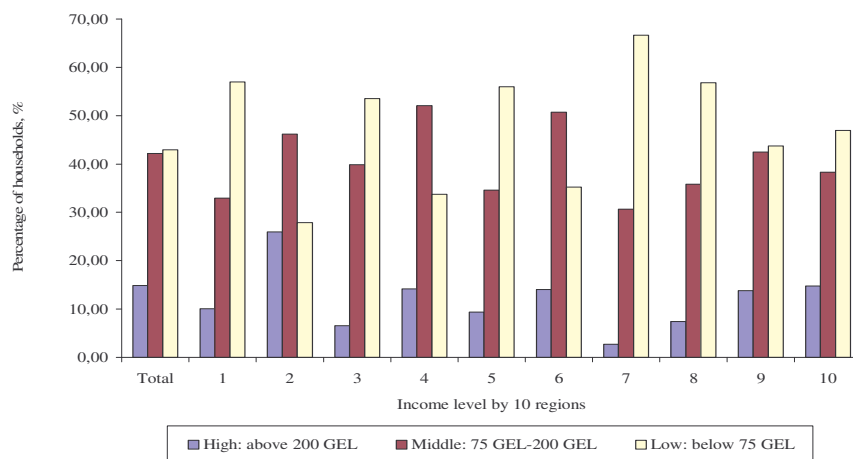


Figure 3. Incomes across and within the regions

a) regions



b) household groups by economic status

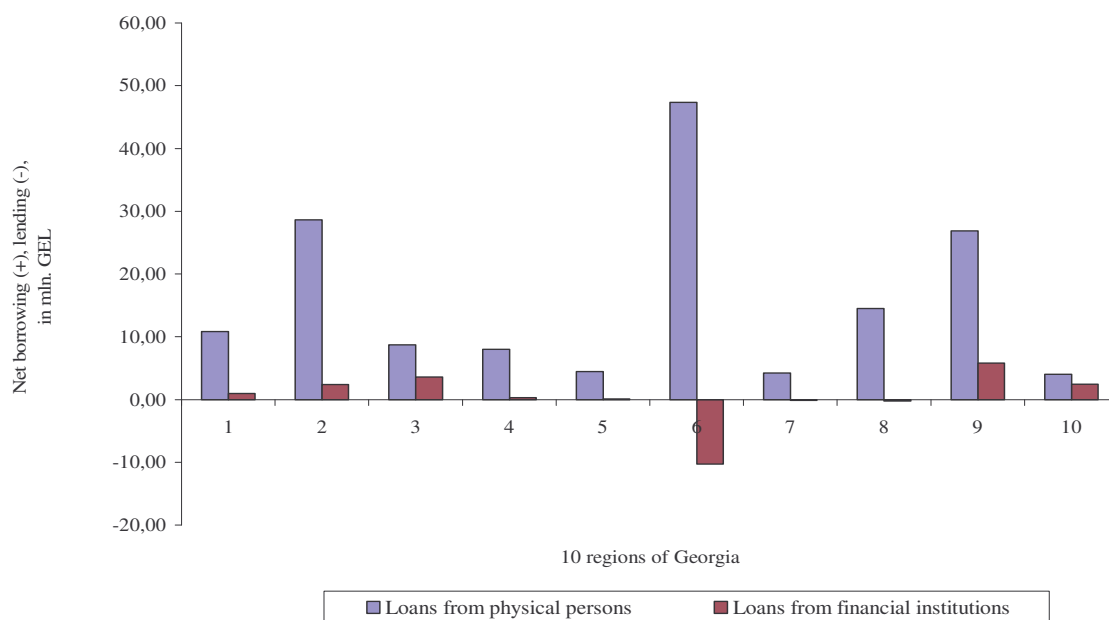
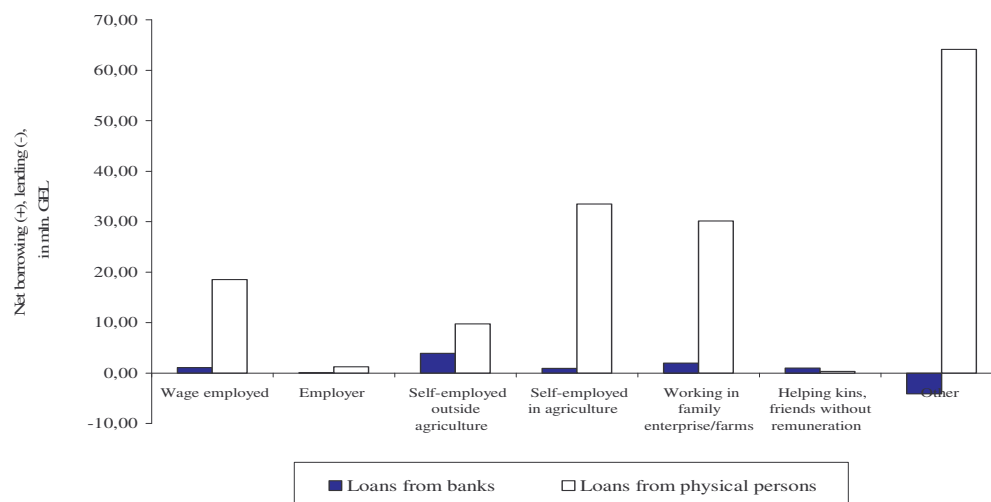


Figure 4. The main sources of credit funds in Georgia by



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