REMITTANCE. FORECASTING METHODOLOGY AND INSTRUMENTS

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Abstract:

Remittances generally reduce the level and severity of poverty and lead to: higher human capital accumulation; improved access to formal financial sector services; enhanced small business investment; more entrepreneurship. Remittances are playing an increasingly large role in the economy of Republic of Moldova, contributing to economic growth and to the livelihoods of less prosperous people. In this context, a special role lies this flow forecasting. Considering these facts, the article aims to describe econometric estimation of money transfers associated with remittances.

Keywords: remittance, forecast, econometrics

JEL Classification : JEL: C53, JEL: F24

Introduction

Remittances are the most visible outcome of migration. International migration can potentially create significant financial and social benefits for migrants, their families, the destination country and the country of origin. Migrants benefit if the net return to their skills is higher in the host country than in their home country while their families benefit from increased consumption and investment as a result of remittances sent by migrants. Furthermore, immigration of workers allows receiving countries to fill their labour market shortages while from the sending country's perspective one of the main benefits of migration stems from the transfer of money from migrants to their families at home, which has a positive effect on the balance of payments. Notwithstanding the several benefits of migration, a large strand of literature has also highlighted the negative aspects as well, primarily that of the brain drain. However, one argument put forward is that the remittance flow from migrants to the home country tends to compensate for any human capital loss.

The collapse of the Soviet Union in 1990 and later the Russian financial crisis of 1998 have had significant detrimental effect on Moldova. Early 1990s saw an increase in migration flows as the restrictions on citizens' movement came to an end coupled with a significant increase in unemployment rate as the country moved from a centralised to the market economy. The economic conditions were further exacerbated after the Russian crisis such that the country's industrial and agricultural output plummeted by 25% and 20% respectively and its exports were reduced by almost half by 1998-1999. In addition to this, major expenditure cuts in 1998 and 1999 due to unsustainable government deficit and privatisation of the agricultural sector increased the unemployment rate even further which moved more population below the poverty line (a total of 80% by 1999). Together, these factors propelled significant migration from the country, making it a mass phenomenon. Some villages lost up to 50 percent of their active population. The sight of villages with only children and elderly became increasingly common in the independent Moldovan state. A direct and significant effect of higher migration rate was the increased flow of remittances into the country. An interesting point to note here is that the level of remittances sent via formal banking channels has been increasing steadily. This increase in inflows had a twin effect on the economy. On the one hand it prevented further decline of the economy by reducing the government's dependence on conditionality based borrowing, while on the other hand it encouraged yet higher outward migration. So, while the country experienced a remarkable increase (more than 30%) in real GDP and a significant decline in the poverty rate (which was reduced to half in a span of merely four years in the period 2000-2004), migrants now accounted for about 28% of the working population and about 18% of the total population of Moldova in 2005. Labour migration from Moldova is broadly directed towards two regions: CIS countries, (predominantly Russia but to a small extent Ukraine as well) and Western Europe, particular to Italy. In addition to this, there is also considerable migration to Israel, Turkey and Romania. Similar dichotomy exists between CIS and other countries in terms of the socio-economic characteristics of migrants to these countries. It is found that migrants to CIS countries are predominantly male, from rural areas with relatively low levels of education. This pattern closely correlates to the characteristics of jobs

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performed by migrants in these countries. More than 65% of migrants to Russia are employed in the construction industry, thus the apparent predominance of low-skilled men migrating to this region. Migrants to the CIS who work in sectors other than the construction industry also come from rural areas but their education levels are slightly higher. By contrast, migrants to the EU are mostly urban females with relatively higher level of qualifications. An analysis of the percentage of earning repatriated indicated that migrants to CIS nations tend to remit a larger share compared to migrants to the EU. The type of job coupled with the legal status in the destination country is a key determinant of the length of the migrant's stay abroad. Additionally, the motivation to migrate (i.e.,economic need or opportunity) also plays an important role. Russia seems to be the destination of choice for temporary migrants, as the construction industry in the country depends on temporary contract work. In addition, migration to Russia is less costly due to both the geographic proximity as well as visa-free travel, making achieving target savings in a relatively short-time more plausible. On the other hand, migration to the EU is more long-term/permanent in nature, which is possibly driven by the difficulty in leaving the region once there as the initial entry is mostly illegal in nature. (Matloob Piracha Amrita Saraogi, 2011)

The insurance motive to remit also means that remittances can be used for consumption, which Lucas and Stark (1985) have shown to be the case in their study. (Lucas, Robert E.B., Oded Stark. 1985)

Description of the problem

It is estimated that approximately 770,000 Moldovans live and work abroad, which represents over half of the economically active population (labour force in 2008 was 1.4 million) and about 21 percent of the total population of Moldova. Remittances are estimated to be around 31 percent of GDP for the year 2008, which is almost twice the figure in 2002 and is about eight times the foreign direct investment and seven times the official development aid the country receives. The share of remittances in GDP since 2006 has been in excess of 30 percent, reflecting the massive dependence of the country on these transfers. An important element of migration from Moldova is that most of it is temporary (or circular) in nature, and this form of migration is primarily to Russia. . (Matloob Piracha Amrita Saraogi, 2011)

The insurance motive for migration and remittances predicts that remittance flows should be countercyclical, or at least less pro-cyclical than other financial flows. Ratha (2003) finds that remittances into developing countries are indeed less volatile than private capital and even more stable than FDI – the more stable component of private capital flows. Moreover, remittances remain relatively stable even during large shocks. The increase in aggregate demand due to the inflow of remittances is partially spent on nontradable goods and services, therefore creating inflationary pressure. The supply of foreign currency tends to cause a nominal exchange rate appreciation. In sum, remittances lead to an appreciation of the real exchange rate, accompanied by the deterioration of the current account. (Ratha, Dilip. 2003)

For the government, the short-run consequences of migration and remittances are a blessing:

- The increase in imports (financed by remittances) increases the state's revenues from import tax and VAT on imports.

- The real exchange rate appreciation facilitates the servicing of public debt. The exchange rate appreciation helps reduce the value of foreign currency-denominated debt the same way in which inflation helps devalue the stock of national currency-denominated debt. Since liabilities of most developing governments are primarily dollar-denominated, the appreciation reduces the overall value of public debt.

- The inflow of foreign currency facilitates the accumulation of foreign reserves by the Central Bank.

- By reducing unemployment, migration effectively reduces the state's payments of unemployment benefits.

However, the analysis of a longer-term horizon hints that migration and remittances may prove to be a mixed blessing for governments of sending countries. Outward migration of the active population deteriorates the dependency ratio – there are fewer workers per nonworker. The increased dependency ratio leads to a ecreased sustainability of "pay as you go" pension systems,

which are traditionally large in the case of transition economies. There are simply not enough working people to pay the pensions of the old. An indirect negative effect of remittances and migration on the long-run performance of public institutions stems from certain short term benefits. Remittances effortlessly bring higher tax revenues, improved balance sheets, higher foreign currency reserves and as we'll see in the next section, short-term economic growth. In such a situation, governments are no longer subject to former stringent constraints, which postpone structural reforms.

The long-term effects constitute a mixed bag of negative (loss of competitiveness due to real exchange rate appreciation/increased wages, reduction of human capital due to brain drain, postponed structural reforms, increased dependency ratio) and positive (increased savings and investment into physical and human capital) effects. Not surprisingly, cross-country evidence provides similarly ambiguous results. The positive impact on investment and savings is the main channel through which remittances affect growth it is estimated that remittances have crossed the 1 billion dollar mark in 2005, or over a third of GDP. Remittances for 2004 alone ($701 million) were comparable to Moldova's total exports for that year ($950m) and rivaled the total cumulated foreign direct investments received from 1997 to 2004 ($774 million). (Culiuc A., 2006)

However, the final test for the impact of migration and remittances on export competitiveness is the export performance itself. Exports have steadily decreased as a share of GDP, while imports have approached 80% in 2005. In fact, in 2005 imports were more than twice larger than exports.

Migration and remittances have affected some other aspects of the economy:

- Since 1999, migration has reduced the number of unemployed receiving benefits by almost ten-fold: from 12 thousand people in 2000 to around a thousand by the end of 2004.

- At the same time the dependency ratio has increased from 1.02 in 1998 to 1.42 in 2004, which has applied additional stress to an already poorly-functioning pension system.

- The increase of imports has lead to a corresponding increase of VAT on imports. Imports generated 56.7% of all VAT in 1999, increasing to 67.4% by 2004. This has lead to a steady increase of VAT revenues in total budget revenues from 41.4% in 1999 to 52.5% in 2004. Effectively, VAT on imports (excluding duties) finance 35% of the budget.

Methodology and data sources

This flow of money across borders has profound social and economic impacts on various aspects of the home economies. In particular, remittances promote access to financial services for the sender and the recipient, thereby increasing financial and social inclusion.

Given this, understanding the factors that determine this flow of money is important, more important is to analyse and contextualise the net benefits of migration and to can forecast this flow of money. But how to estimate this flow of money. In general we can estimate that remittance is the money transfers from abroad from the data of National Bank of Moldova.
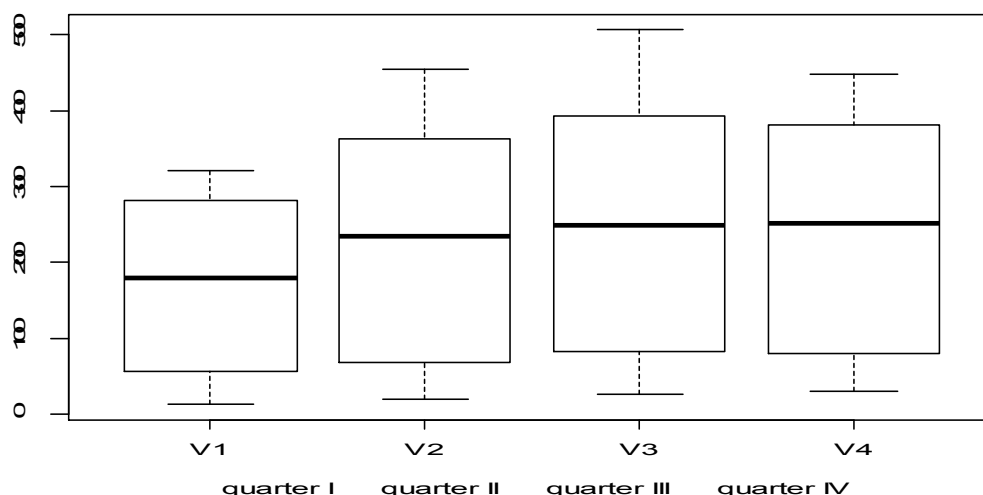
Money transfers from abroad in favor of individuals (resident and nonresident) represent amounts of money remitted in the country through the national banking system, including international money transfer systems. Amounts are converted from the original transfer currency into US dollars at the official exchange rate of the NBM on the transfer date. It should be noted that the origin as well as the purpose of these amounts can be varied. They include, besides the amounts transferred by Moldovan migrants, other foreign exchange transfers.(National Bank of Moldova, 2014)

There are two ways of forecasting using regresion and times series analysis. Regression is an approach for modeling the relationship between a scalar dependent variable and one or more explanatory variables , but most of this kind of models give wrong forecasting results as compesation equation from IMF report (IMF, Republic of Moldova: Selected Issues, 2012, p.59). There are a multitude of options to develop an econometric model, and then based on it, to forecast in the short term. Nowadays trends in forecasting bank transfers are based on models in which the

growth rate of GDP of that country or REER (real effective exchange rate), appearing as variables. But the problem is that most of them give wrong forecast in the short term. I decided to use ARIMA and exponetial smoothing models.

Results obtained

As we can see from the box plot representation of money transfers the most amount of money come in the last two quarters of the year. Making a bigger impact on the exchange rate appreciation.

Figure 1. Box plot of money transfers by quarters
Source: NBM, Money Transfers from Abroad in Favor of Individuals, author's representation

The model exponetial smoothing (error, trend, seasonality) was choosen, general notation ETS(Error,Trend,Seasonal) All exponential smoothing models can be written using analogous state space equations. In general there are 15 separate exponential smoothing methods each having additive or multiplicative errors, resulting in 30 separate models. From the multitude of models was chosen as the criterion AIC model multiplicative Holt-Winters method with multiplicative error. AIC criterion is very useful to compare different models and select best model. (Automatic Time Series Forecasting: The forecast Package for R , 2014)

Forecasts from ETS(M,A,M)
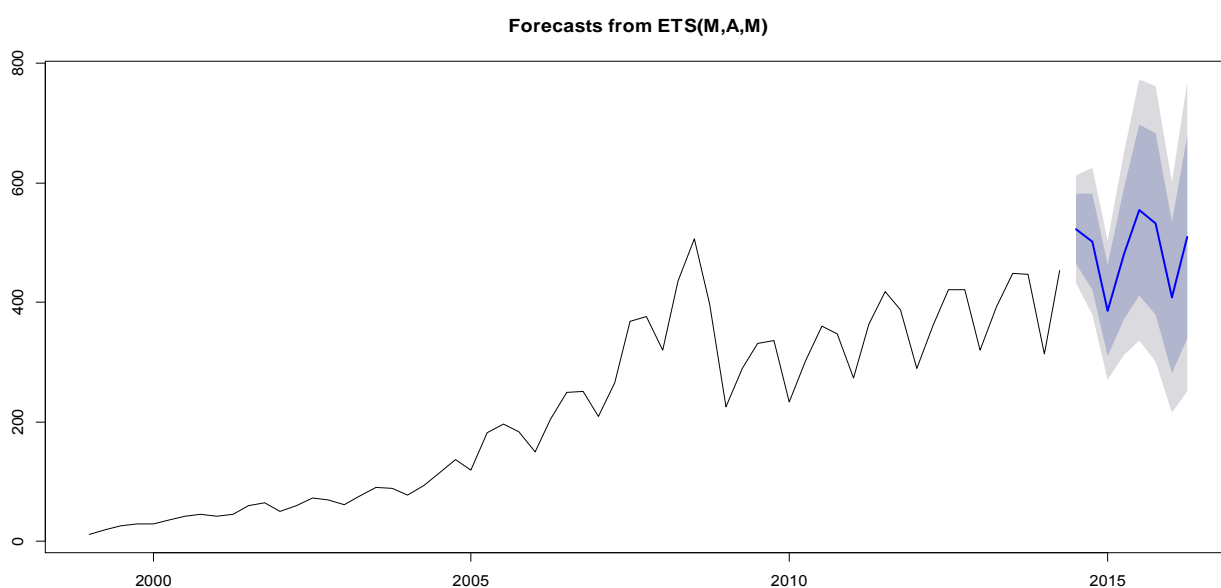
Figure 2. Money transfers from 1999-2014 and forecast
Source: NBM, Money Transfers from Abroad in Favor of Individuals, author's representation.

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Point Forecast Lo 80 Hi 80 Lo 95 Hi 95

2014 Q3 522.9202 464.0999 581.7406 432.9622 612.8783

2014 Q4 501.7885 421.4681 582.1090 378.9490 624.6281

2015 Q1 386.2313 310.0397 462.4229 269.7063 502.7564

2015 Q2 481.5593 371.1802 591.9385 312.7490 650.3697

2015 Q3 554.2118 411.2952 697.1284 335.6397 772.7839

2015 Q4 531.3730 380.3307 682.4153 300.3737 762.3723

2016 Q1 408.6720 282.4176 534.9265 215.5825 601.7615

2016 Q2 509.1382 339.9382 678.3381 250.3692 767.9071

Figure 3. Forecast of money transfers.

Source: author's calculations

Conclusions

Is better to use the methodology of the model for forecasting the direction of tranfers through the study of past market data, but not to the study of economic factors that influence the money transfers. The factors as GDP, REER, the posible crisis or sanctions is not in the model, it holds that quotes already reflect all the underlying factors. At the same time the money transfers not necessarily will behave as in the past for example a crisis can start. The model have some limitation but without drawing attention to these things generally give accurate predictions. The model forecast show that the money transfers will be aproximatley at the same level with a little increase for the next quarters.

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