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**Workers' Remittances to Former Soviet States**

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### **Abstract**

Workers' remittances are an important source of external finance for many former Soviet countries. Nevertheless, the determinants of remittances are only rarely analyzed. Using panel-data estimation techniques the study comes to the following major results: Remittances are highly persistent. They can only be partly explained by income. Furthermore, the performance of the domestic banking sector and the access of the private sector to credit play an important role. Better international integration and a better quality of institutions lead to an increase in remittances. (83 words)

Keywords: remittances, migration, economic development, panel data model

JEL classification: F22, F36, 015

## 1. Motivation

The collapse of the socialist system led to a tremendous increase of all kind of cross-border flows from and to former Soviet countries. While there exists a huge literature on the determinants of trade and international capital flows, the analysis of workers' remittances to those countries has been almost neglected.<sup>1</sup>

Theoretical studies on remittances taking a macroeconomic point of view often focus on the impact of remittances on the current account. Remittances increase the foreign exchange provision and with remittances the economy can spend more than it produces at home (Connell/Conway 2000). While one group of authors argues that this increases the base for investment, a second strand of literature states that "Dutch disease" effects might occur. Bringing together the above mentioned arguments McCromwick/Wahba (2000) emphasize that the impact of remittances on economic development depends on the domestic policy. Concerning the macroeconomic determinants of remittances a concise theoretical framework is still pending. Nevertheless, most theoretical models indirectly mention the importance of the income situation in the home country, the costs of migration and the performance of the financial sector in the domestic.

Nowadays, remittances are often considered as the driving force behind migration (World Bank 1995, 2005). Recent empirical studies on the macroeconomics of remittances are often taking broad-country sets. They usually show that remittances have a positive impact on the economy in the home country of the remitter (World Bank 2005; IMF 2005). Focusing on transition countries León-Ledesma/Piracha (2001/2004) argue that remittances have a highly positive impact on productivity and employment in

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<sup>1</sup> Conceptually, workers remittances are defined to be transfers that migrants return to their home country.

the home country. While the consensus of empirical studies on *impact* of remittances on the home country increased during the last years, there is no strong consensus about the *determinants* of remittances (Schrooten 2005; Buch/Kuckulenz 2004; Buch et al. 2002; Adelman/Taylor 1990; Straubhaar 1986; El-Sakka 1999).

Therefore this paper seeks to fill at least three analytical gaps: First, the study focuses on the CIS member states - a country set rarely analysed in this context. Second, to take advantage of the full information in the data set, panel estimation techniques are employed. Third, since these countries underwent far reaching legal changes the impact of the general institutional is analysed. Main findings are: Remittances are highly persistent. The baseline model shows that the per capita income can not explain the size of remittances. Furthermore, the general conditions in the domestic banking sector, reflected in the transaction costs and the access for the private sector to credit are important.

The paper is organized as follows: in the next chapter, some stylized facts on the size and importance of workers' remittances to CIS countries are presented. Chapter three reconsiders the "theory of remittances". Chapter four outlines the econometric approach. In chapter five, the empirical results are discussed. In the conclusion, findings are summarized and some policy recommendations are developed.

## **2. Loss of Population and Migration**

After the collapse of the Soviet Union 15 independent states emerged. The transition and disintegration of the Soviet Union, as well as the transition to a market economy brought on a severe economic recession to the region. The sharp decrease in output was accompanied by an increase in poverty and unemployment. However, during the last years these countries enjoyed a significant rebound. Nevertheless, concerning population development, migration and ageing most of these countries are confronted with severe and similar problems. This is true despite the fact that the successor states of the Soviet Union can be divided into two groups. One group, consisting of the three Baltic States, Estonia, Latvia and Lithuania oriented their economic policy towards a membership in the European Union. Recently, about 6.9 million persons are living in these states, which joined EU in May 2004. A second group of former Soviet States is organized in the Commonwealth of Independent States (CIS). Recent members of the CIS are Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan and the Ukraine<sup>2</sup>. Nowadays, more than 250 million persons are living in these 12 countries – this is about 35 times more than in the Baltic States.

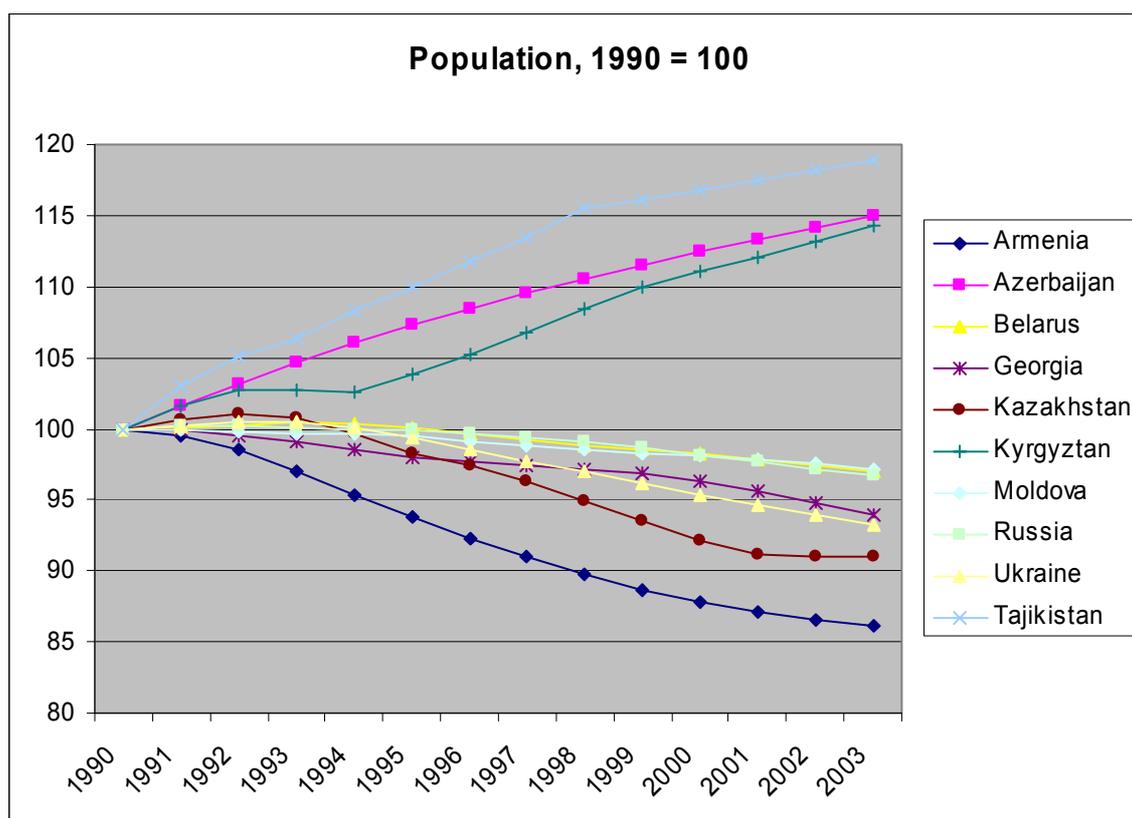
Both country groups differ in many respects. However, the shrinkage of population is a widely spread feature. During the period 1993 – 2003 the population of Baltic States decreased by around 8 per cent, the population decrease of the CIS member states

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<sup>2</sup> In September 1993 the Heads of the CIS States signed an Agreement on the creation of Economic Union. The general aims are to form a common economic space grounded on free movement of goods, services, labour force, capital; to elaborate coordinated monetary, tax, price, customs, external economic policy; to bring together methods of regulating economic activity and create favourable conditions for the development of direct production relations. <http://www.cisstat.com/eng/cis.htm>.

reached about 4 per cent. In nominal terms, the population in the Commonwealth of Independent State decreased by about 10 million people during period 1993-2003. Nevertheless, the decrease in population did not affect all CIS member states in the same way. Measured in absolute terms the population shrinkage has been very high in Russia; the population was lower by nearly 5 million in 2003 than in 1990. In contrast, in Azerbaijan, Kyrgyztan and Tajikistan three of the poorest successor states of the Soviet Union, the population increased over time (figure 1).

**Figure 1: Population, 1990=100**



Source: World Bank. World Development Indicators. Own calculations.

The shrinkage of population is due to several factors: First, there was a sharp fall in birth rates. Second, most of these countries experienced a decrease in life expectancy during transformation. Third, especially in the early period of transition emigration was high.<sup>3</sup> During this time permanent migration permanent of ethnic groups occurred.<sup>4</sup> From 1993 many host countries started to introduce more restrictive policies. This was often accompanied by facilitating seasonal work and subcontracted employment.<sup>5</sup> Taking these different patterns into account it can be said, that over time the incentive for temporary movement increased, while the incentive for permanent migration decreased. However, the numbers of migrants between CIS countries is large, as people from the countries with low economic performance like Kyrgyzstan, Tajikistan and Uzbekistan seek jobs and better lives in those countries with better-off economies. Important hosting countries are Russia and more recently Kazakhstan. Tajikistan, in contrast, has become one of the major countries for transit migrants who are trying to get to Russia or to western countries. All in all, in the years 1990-2000 most of the successor states of the Soviet Union reported a negative net migration (figure 2). One important exception is the Russian Federation which shows a high positive net migration figure. This is at least partly due to considerable migration from other former Soviet republics, which seems to follow three rules: (1) forced migration from areas with ethnic or civil war, (2) post-Soviet repatriation of ethnic Russians to Russia and (3) economic reasons (Codagnone 1998). Nevertheless, the demographic development in

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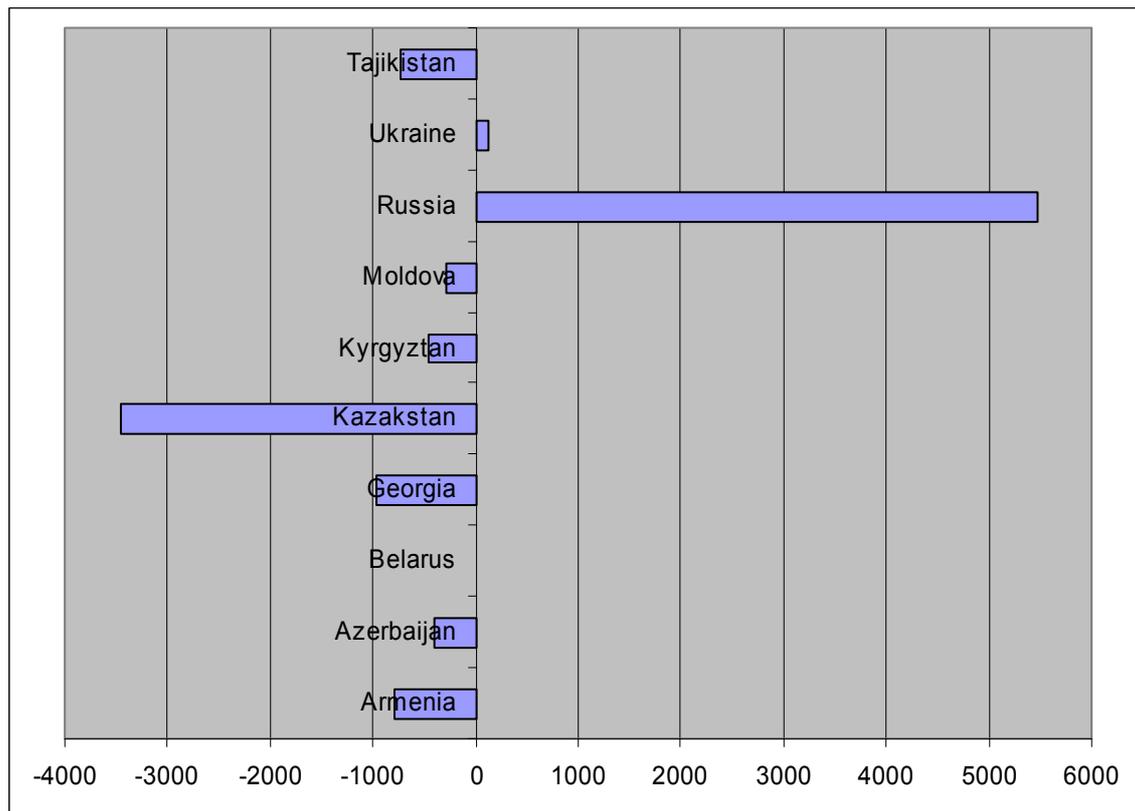
<sup>3</sup> This phenomenon occurred very pronounced in Kazakhstan, which lost over three million people from 1989 due to migration, or more than 20 per cent of its population.

<sup>4</sup> These flows were mainly directed to Germany, Finland, and Turkey. Turkey took a little more than 300,000 Bulgarians of Turkish origin.

<sup>5</sup> For instance, the agreement between Poland and Germany meant that there were nearly 200,000 seasonal and about the same number of temporary contract workers employed in Germany in 1999.

former Soviet states can not be only explained by migration. Furthermore there seems to be evidence that other cultural and economic factors play an important role.

**Figure 2: Net Migration (1990-2000), in thousands**



Source: The World Bank. World Development Indicators CD ROM 2005. Own calculations.

Migration is a precondition for remittances. However, while workers' remittances and migration are strongly linked, they are not totally correlated. Workers' remittances are transfers from a citizen living abroad to the home country. Therefore workers' remittances appear as current transfers in the current account of the balance of payment

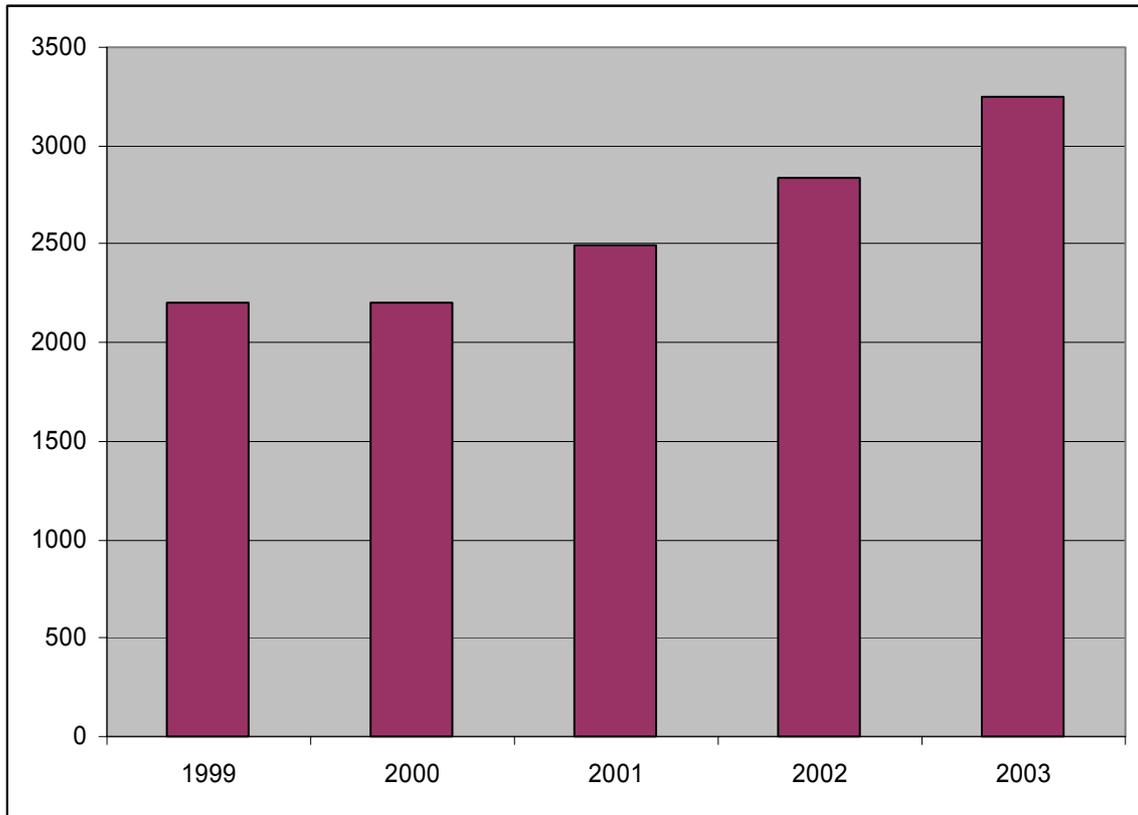
system and are conceptually part of the gross national product.<sup>6</sup> In general the International Monetary Funds distinguishes between three categories of migrants' transfers: (1) workers' remittances, from workers living abroad for more than one year, (2) compensation of employees, from workers living abroad less than one year and (3) migrants' transfers, which reflect the migrants' claims on residents of an economy. The most important data source for workers' remittances are the Balance of Payment Statistics (BoP) published by the International Monetary Fund and the World Development Indicators (WDI) dataset available by the World Bank (for details see Appendix, table 2). In 2003 remittances to the countries under consideration amounted for more than 3 billion US dollar (figure 3).<sup>7</sup>

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<sup>6</sup> Despite the fact that remittances, as money earned abroad by nationals, are part of Gross National Product they are, however, only rarely reported and published in the SNA statistics.

<sup>7</sup> Tajikistan reports remittances only since 2001.

**Figure 3: Remittances, mill. US dollar**



Source: The Worldbank. World Development Indicators CD ROM 2005. Own calculations.

Nevertheless, we have to bear in mind that these figures only represent the official data. Remittances are often paid in kind or via a non-official courier. This might be also due to high transaction costs<sup>8</sup>, strong regulations but also a weak payment and banking system.<sup>9</sup> Therefore it can be assumed that official figures tend to underestimate the real size of remittances, consequently remittances reported in the balance-of-payments

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<sup>8</sup> Involving both explicit fees and exchange rate spreads.

<sup>9</sup> Anecdotal evidence suggests that incentives such as tax exemptions or preferential credits for migrants may affect significantly the share of remittances sent through the banking system (official remittances). The IMF argues that for instance, in Tajikistan, eliminating the taxation of remittances led to an increase in recorded remittances from \$4 million in 2002 Q1 to \$56 million in 2004 Q1. IMF (2005): World Economic Outlook. p. 83.

statistics have to be considered as a minimum level.<sup>10</sup> Part of the money earned abroad may be either sent more or less regularly to relatives or members of the social net at home or repatriated upon return, depending on personal circumstances and on existing financial infrastructures in both the hosting and the home country.

Despite general data problems, official figures show, that the amount of remittances not only increased over time but also differs widely among the countries under consideration. In nominal terms the Russian Federation is the most important recipient of remittances (table 1), followed by Moldova. However, remittances measured in nominal terms give only first insights concerning the importance of these cross-border transfers for a given country. More meaningful are the remittances per capita. In 2003, by far the highest per capita remittances were received in Moldova.

**Table 1: Workers' Remittances in 2003**

<b>Remittances in mill. US dollars</b>		<b>Remittances per capita in US dollars</b>	
Russian Federation	1453	Moldova	108
Moldova	465	Georgia	48
Ukraine	330	Armenia	44
Georgia	246	Tajikistan	23
Tajikistan	187	Kyrgyz Republic	22

Source: Wordbank: World Development Indicators. CD ROM 2005. Own calculations.

The dependency of a country on remittances is often measured in terms of the GDP and exports. By far the highest dependence on remittances, measured in percent of GDP,

<sup>10</sup> Estimations of the size of these informal transfers are difficult. A recent IMF study on the size of workers' remittances comes to the result that worldwide informal remittances reach the amount of around 10 billion US-dollar per annum (El-Qorchi, Maimbo and Wilson 2002). To tackle the data problems a joint working group of the IMF and the Worldbank started in January 2005 with a focus on the measurement problems concerning workers' remittances.

<http://www.worldbank.org/data/remittances.html#s1>.

was reached in Moldova, where remittances amounted for more than 20 per cent of GDP. But also a share as reported in Tajikistan can be considered as extraordinary high in international comparison. Measuring the dependency of the domestic economy on remittances in terms of exports of goods and services does not change the picture.

**Table 2: Economic Dependency on Remittances 2003**

<b>Remittances in percent of GDP</b>		<b>Remittances in percent of exports</b>	
Moldova	23.7	Moldova	44.1
Tajikistan	9.4	Georgia	19.4
Georgia	6.2	Armenia	18.8
Armenia	6	Tajikistan	18.7
Kyrgyz Republic	5.7	Kyrgyz Republic	14.9

Source: Worldbank: World Development Indicators. CD ROM 2005. Own calculations.

**Table 3: Remittances and FDI, 2003**

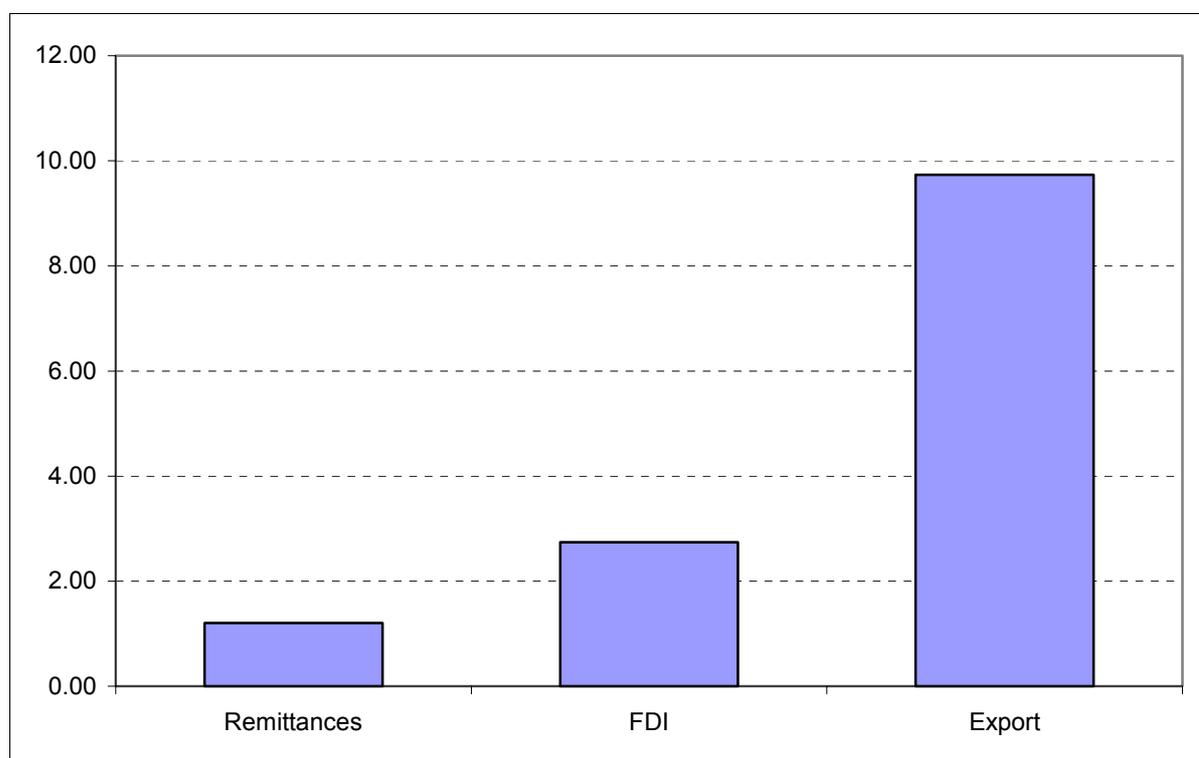
<b>Remittances in percent of FDI (net)</b>	
Moldova	796.6
Kyrgyz Republic	237.1
Tajikistan	590.8
Armenia	139.4
Belarus	95.1

Source: Wordbank: World Development Indicators. CD ROM 2005. Own calculations.

The importance of remittances for the economy is also reflected in the ratio of remittances to foreign direct investment. In Moldova, Krygyztan, Tajikistan and Armenia remittances exceed this kind of private capital inflow (table 3). Therefore remittances have to be also considered as a major source for foreign exchange in many countries. The importance of remittances for a given country does not only derive from

the size but also from the fact, that the flow of remittances show a much higher stability over time than for example FDI and exports (figure 4). At a glance, promoting migration and remittances can be considered a promising development strategy for low-income countries.

**Figure 4: Volatility\* (1992 - 2003)**



\*Volatility is measured as the standard deviation of the ratio of the relevant inflow to GDP.  
Source: Wordbank: World Development Indicators. CD ROM 2005. Own calculations.

### **3. Data and Descriptive statistics**

Studies that empirically analyse the determinants and effects of remittances face the same problem: it is nearly impossible to obtain reliable official figures. Time series on remittances are relatively rare. Nevertheless, the World Bank offers figures on remittances in their World Development Indicators. Most of the CIS member states are reporting remittances since several years. Exceptions are made by Turkmenistan which reported remittances only for the year 1996 and Uzbekistan which is declaring remittances not at all. The general data set starts from 1993, nevertheless some of the countries began to report remittances only in the second half of the 90ies. Consequently, here we have to work with an unbalanced panel data set.

In our study the dependent variable is remittances to GDP. According to the economic literature remittances depend on personal factors as well as general factors in the sending and the hosting country. Here we focus on the question: Which are the important factors in the labour exporting countries? According to the existing literature the set of potential key determinants is as follows:

#### ***Persistence of remittances***

**Lagged remittances.** Remittances are cross border payments made by a migrant to support people in the home country. Remittances are mostly part of a long term relationship between the migrant and the people at home. Therefore, remittances are usually not very volatile. Furthermore, recent remittances seem to depend to a certain degree on the previous remittances. To account for this persistence here a lagged remittances are considered as to be important.

#### ***Income variable***

The income level is captured by **GDP per capita**. According to the theory on remittances a higher domestic income makes remittances to support the relatives at home less necessary. In addition, the influence of the per capita growth on remittances is checked. The per capita growth rate can be considered as an indicator for the future perspectives of the economy.

### ***Uncertainty***

The **unemployment rate** is used as an indicator for tensions on the domestic labour market. High unemployment rates give an incentive to migrate and to send money home. According to the microeconomic literature remittances fulfil the function as an insurance against income risk. In both cases, a positive sign of the variable is expected.

### ***International integration***

**Openness.** The openness of a given economy and its international integration is measured by the standard openness indicator, the sum of exports and imports over GDP. A higher degree of international integration of the real sector makes the export of labour forces - which is a precondition for remittances - less attractive. Therefore a negative sign of this variable is expected.

### ***Access to credit and financial transaction costs***

According to the economic theory on remittances they can be at least partly explained by a weak performing financial market in home country of the migrant. The general argumentation is as follows: It can be assumed that the migrant herself is not able to cover the full migration costs. Therefore before migration the family is granting an informal intra-family credit. The informal character of the credit is usually necessary because of the weak financial system which can not offer

appropriate financial products for the potential migrant. Remittances of the migrant therefore can be at least partly explained by the re-payment of the intra-family loan. To capture the influence of this kind of market failure here the variable **domestic credit to the private sector in percent of GDP** is taken into account. A low access to official domestic credit thus would imply higher remittances. Also the spread between the deposit and the lending rate indicates the performance of the banking sector. A high spread is an indicator for a low performance and high **transaction costs** in the banking sector. A low performing banking sector could be substituted by remittances. Consequently, a positive sign of this variable is expected.

### *Institutional development*

In addition, a variable concerning general institutional situation of the countries is constructed, based on both quality of the domestic and the international institutions. To capture the quality of the domestic institutional framework data from the EBRD transition report are used. In general the transition index runs from 1 to 4.5. As higher the figure is as better is the institutional framework. To capture also the quality of the institutional framework on cross-border transactions this indicator was combined with the years of membership in the WTO.

All in all, according to the theory the economic performance of the migrant's home country plays an important role concerning the propensity to remit (table 4). Thereby it is assumed that remittances are due to different subjective motives. Nevertheless, these subjective motives are influenced highly by the macroeconomic conditions in the home country of the migrant.

**Table 4: Expected signs of the independent variables**

	<b>Explanatory variable</b>	<b>Expected sign</b>	<b>Potential motive of the migrant</b>
<i>Persistence</i>	Lagged remittances	+	Altruism, Investment, Insurance
<i>Income</i>	Per capita GDP	-/+	Altruism Investment
<i>Uncertainty</i>	Unemployment	+	Altruism Insurance
<i>International integration</i>	Openness	-	
<i>Access to domestic credit</i>	Credit to private sector	-	Insurance, investment
<i>Transaction costs</i>	Spread	+	Investment
<i>Portfolio choice</i>	Real Interest Rate	+	Investment
<i>Quality of the institutional framework</i>	Institutional development indicator	+/-	Altruism, Investment, Insurance

#### 4. Econometric Modelling and Estimation Results

Addressing the analysis of remittances empirically two major econometric problems occur. First, the share of remittances to GDP might be rather persistent, i.e. the current values might on the past values. Therefore, a dynamic model specification is required. Second, it is very likely that many of the explanatory variables are determined jointly with the share of remittances to GDP – endogeneity might occur. To tackle these problems this study employs an econometric model using first-differenced GMM estimator. This estimation procedure relies on a mild assumption concerning the initial conditions process and provides a framework that enables to deal explicitly with the problem of potential endogeneity of explanatory variables using a set of appropriate instrument variables (Arellano/Bond 1991).

Therefore, throughout this study, dynamic panel data models of the form

$$(1) \quad rem_{it} = \alpha + \beta_1 rem_{i,t-1} + \beta_2 x_{it} + v_{it}$$

are estimated, with  $rem_{it}$  denoting the share of remittances to GDP,  $x_{it}$  the set of potential explanatory variables,  $v_{it}$  a white-noise disturbance term, and  $i$  and  $t$  denoting country and time period, respectively with  $\beta_i$  and  $\alpha$  as estimation coefficients.<sup>11</sup> Since some of the independent variable might be jointly determined with the dependent

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<sup>11</sup> Other recent estimation approaches such as the Pooled Mean Group Estimation (Pesaran/Shin/Smith 1999) which allow for a higher degree of heterogeneity across countries, require that the number of time series observations be large enough that the model can be estimated for each country separately. This cannot be applied to our short panel.

variable, strict exogeneity of all independent variables cannot be assumed. In the literature three cases are distinguished: (a) If the  $x_{it}$  process is strictly exogenous, there is no correlation between the  $x_{it}$  process and the disturbance term  $v_{it}$ . (b) If the  $x_{it}$  process is weakly exogenous or predetermined, it is correlated with past realizations of the disturbance term, but uncorrelated with present or future realizations of the disturbance term. (c) If the  $x_{it}$  process is endogenously determined, it is correlated with past and present realizations of the disturbance term, but uncorrelated with future realizations of the disturbance term. In case b and c instrument variables are used.

Using the Arellano/Bond estimation techniques, offered by Stata 9.0 adequate instrument variables have to be defined. For each estimation model, the validity of the instrument variables is checked using the Sargan test of over-identifying restrictions (see e.g. Arellano/Bond 1991).<sup>12</sup> Furthermore, since the consistency of the GMM estimator depends upon the assumption that the disturbance terms are not serially correlated, we always check for this, exploiting the fact that if the disturbance terms are serially correlated, we will detect second-order serial correlation in the first-differenced residuals. The lack of second-order serial correlation in the differenced residuals therefore indicates that the disturbance terms are serially uncorrelated.<sup>13</sup> The dynamic specification is required to assure that the parameters of interest can be identified and

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<sup>12</sup> The hypothesis being tested with the Sargan test is that the instrumental variables are uncorrelated to some set of residuals, and therefore they are acceptable, healthy, instruments. The model specification is confirmed if the null hypothesis, stating that the instruments are valid, cannot be rejected.

<sup>13</sup> Since in small samples, like our data set, the two-stage GMM estimator may have poor properties here going in line with the existing literature the more stable first-stage estimator is used.

precisely estimated (see Bond 2002). Using this framework allows us to analyze short-run and long-run effects of the explanatory variables on remittances.<sup>14</sup>

In the baseline regression, lagged remittances, per capita GDP, the transaction costs in the banking sector and the access of the private sector to credit are included. Then, additional potentially relevant variables are checked one by one to see whether they fit into the model. The general dataset covers the years 1993 to 2003. The dependent variable and some of the explanatory variables are taken in logs, and the resulting coefficients can thus be interpreted as elasticities. A coefficient of, say, 0.2 on one of the logged explanatory variables (such as per capita GDP) would imply that a 1% increase in this variables would trigger a 0.2% increase in the dependent variable (such as remittances to GDP).

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<sup>14</sup> These different effects are calculated as follows: Consider an autoregressive distributed lag model with  $m$  lags of the endogenous variable and  $n$  lags of the exogenous variable  $y_t = a_1y_{t-1} + a_2y_{t-2} + \dots + a_my_{t-m} + c_0x_t + c_1x_{t-1} + \dots + c_nx_{t-n} + u_t$ . Using the lag (or backshift) operator  $L$  with  $L^j x_t = x_{t-j}$  leads to Setting  $L=0$  gives us the impact multiplier, which reflects the immediate (= short-run) effect of a change in  $x_t$  on  $y_t$ . The impact multiplier is  $c_0$ . Setting  $L=1$  gives us the overall multiplier, which reflects the overall (= long-run) effect of a change in the explanatory variable on the dependent variable. The overall multiplier is

$$y_t = \frac{\sum_{j=0}^n c_j L^j}{1 - \sum_{k=1}^m a_k L^k} x_t + \frac{1}{1 - \sum_{k=1}^m a_k L^k} u_t.$$

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$$\sum_{j=0}^n c_j / 1 - \sum_{k=1}^m a_k .$$

## 5. Results

The main results are: Remittances are highly persistent. Income as well as the unemployment rate does not play a major role. Furthermore, the conditions in the financial sector have an important impact on remittances (table 5).

In detail: Focusing on the baseline model (table 5, column a) we find that recent remittances in percent of GDP are highly dependent on former remittances. In other words, a country with a history of remittances can expect future financial flows out of this source. However, the income situation, captured in the per-capita GDP does not affect the amount of remittances significantly. This finding gives new insights into the macroeconomics of remittances, since in the literature remittances are often considered as an alternative source of national income, declining with the economic performance of the home country of the remitter. Obviously, concerning this variable the CIS member states show a different remittances pattern than many other emerging economies. Consequently, the classical motive of remittances which comes out of altruism has to be – at least partly - questioned in the case of CIS countries. Furthermore, the conditions in the financial sector play an important role – this supports the idea that remittances are often made out of investment motives. The private sector's access to credit is positively linked to the size of remittances, both in the short and the long-run. Therefore there seems to be evidence, that remittances are used as a certain form of co-financing. In addition, the transaction costs in the banking sector are crucial for remittances. Nevertheless, only the lagged transaction acts are significantly related to the size of remittances. Since transaction costs can be considered as an indicator for the performance of the banking sector this finding can be interpreted as follows: as lower

the performance of the domestic banking sector as higher remittances. Consequently, remittances can be considered as to operate as a substitute for a well-performing financial sector.

Model 2 lines out that the size of remittances is not significantly linked to the rate of unemployment in the labour exporting country. Therefore, remittances in the case of CIS member states can not directly be considered as a tool to handle the often relatively high unemployment rate. In addition, also the other extensions of the model underpin the hypothesis that remittances to CIS countries are persistent and only slightly related to the per capita income. In the cases when the income variable is significant, only the lagged income affects the remittances significantly. In these cases, it is shown that the long-run effect of this variable on the size of remittances is negative. However, model 3 indicates that a higher degree of international integration in the good and service market goes in line with higher remittances. Therefore remittances can be considered part of the overall international integration of the country and not as a substitute. This finding is underpinned by model 4, which is testing the effect of the WTO membership on remittances. As longer this membership is lasting – as better usually the institutions for external transactions – as higher the remittances. The same effect is reported concerning the quality of the overall institutional framework. A higher quality leads to significantly higher remittances.

**Table 5: Results - Dependent variable: Remittances/GDP**

	1	2	3	4	5
Lagged remittances	0.15 (4.56)**	0.36 (4.68)***	0.11 (3.51)***	0.13 (4.36)***	0.13 (42.6)***
GDP per capita	0.16 -0.18	0.7 -0.63	1.47 -1.47	0.89 -0.99	0.72 -0.8
Lagged GDP per capita	-1.05 (-1.35)	-0.2 (-0.21)	-2.26 (-2.46)**	-1.59 (-2.01)**	-1.51 (-1.89)**
Credit to the private sector	0.43 (3.28)***	0.33 (2.14)**	0.49 (3.54)***	0.36 (2.69)***	0.34 (2.52)**
Lagged credit to the private sector	-0.26 (-2.12)**	-0.17 (-1.17)	-0.25 (-2.00)**	-0.25 (-2.14)**	-0.28 (-2.31)**
Transaction costs	0.12 -1.5	0.18 (1.82)*	0.18 (-2.43)**	0.11 -1.45	0.11 -1.45
Lagged transaction costs	0.3 (5.08)***	0.16 (2.18)**	0.27 (4.50)***	0.24 (3.77)***	0.24 (3.74)***
Unemployment		0.13 -1.25			
Lagged unemployment		0.06 -0.56			
Openness			0.8 (2.21)**		
Lagged Openness			-0.03 (-0.10)		
WTO				0.09 (2.62)**	
Institutional development					0.29 (2.27)**
Constant	0.19 (6.39)***	0.06 -1.24	0.19 (6.65)***	0.08 (4.22)***	0.16 (4.66)***
Number of observation	75	60	75	75	74
Sargan Test	104.91 (0.1195)	52.51 (0.9715)	95.69 (0.7310)	102.27 (0.1589)	102.44 (0.1562)
AR (1) Test	-2.25 (0.0243)	-2.91 (0.0010)	-2.50 (0.0010)	-2.32 (0.0206)	-2.24 (0.0249)
AR (2) Test	-0.33 (0.7439)	0.76 (0.4457)	0.01 (0.9938)	-0.30 (0.7677)	-0.35 (0.7269)

Notes: t-values in brackets. \*, \*\* and \*\*\*: significant at the 10%, 5% and 1% level.

## 6. Conclusions

Remittances play an important role in the case of CIS countries. Many of these countries report a ratio of remittances to GDP ratio higher than 3 percent. The analysis showed that remittances are highly persistent over time. In the baseline model, the impact of the per capita income is not significant. Furthermore, the general conditions in the financial sector are important. The extensions of the model show that the rate of unemployment does not affect remittances. However, an increasing international integration as well as a better quality of institutions is related to higher remittances.

All in all, the findings give first insights into the general patterns of remittances to the CIS countries. Especially, the comparable low explanatory power of the per capita income and the unemployment rate, question the often assumed altruistic motive of remittances. Furthermore there seems to be evidence that remittances are more or less related to investment perspectives and therefore to the conditions in the domestic financial sector as well as to the quality of institutions.

These findings are rather important since the majority of the CIS countries are still in their infancy as market economies. However, many of them have undertaken enormous efforts in terms of privatization, enterprise and bank reforms, competition policy, and price and trade liberalization. Nevertheless, the quality of the institutional framework as well as the condition in the domestic banking sector cannot be considered as to be sufficient. According to our results further improvements especially concerning the access of the private sector to credit as well as in the institutional framework could lead to an increase in remittances – out of the investment motive. However, this paper is only a first attempt to analyze the role of migration and remittances in the development

process of CIS countries. A natural extension of this study would be the analysis of the determinants remittances based on survey data.

## Appendix

**Table A1: Country Set**

Armenia	Georgia	Moldova	Ukraine
Azerbaijan	Kazakhstan	Russian Federation	
Belarus	Kyrgyz Republic	Tatjikistan	

**Table A2: Data Sources**

<b>Data</b>	<b>Source</b>
Credit to private sector (% of GDP)	World Bank, World Development Indicators, International Monetary Fund, International Financial Statistics
GDP per capita	World Bank, World Development Indicators
Growth rate	World Bank, World Development Indicators
Openness	World Bank, World Development Indicators, International Monetary Fund, International Financial Statistics
Population	World Bank, World Development Indicators, national statistics
Remittances	World Bank, World Development Indicators, International Monetary Fund, Balance of Payments Statistics
Interest rates	World Bank, World Development Indicators, International Monetary Fund, International Financial Statistics, EBRD Transition Report, national statistics
Transition indicator	European Bank for Reconstruction and Development, EBRD Transition Report, own calculations
Unemployment	World Bank, World Development Indicators, national statistics, EBRD Transition Report

## References

1. Adelman, I. and Taylor J. E. (1990). 'Is Structural Adjustment with a Human Face Possible? The Case of Mexico', *Journal of Development Studies* 26: 387-407.
2. Arellano, M. and Bond, S. (1991). 'Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations', *Review of Economic Studies*, 58: pp. 277–97.
3. Bond, S. (2002). 'Dynamic panel data models: A guide to micro data methods and practice', *Cemmap Working Paper CWP09/02*, Department of Economics, Institute for Fiscal Studies, London.
4. Buch, C. and Kuckulenz, A. (2004). 'Worker Remittances and Capital Flows to Developing Countries', ZEW Discussion Paper No. 04-31.
5. Buch, C., Kuckulenz, A. and Manchec, H. M. (2002). 'Remittances and Capital Flows', Kiel Working Paper No. 1130, Kiel Institute for World Economics.
6. El-Sakka, M. I. T. and McNabb R. (1999). 'The Macroeconomic Determinants of Emigrant Remittances', *World Development* 27 (8): 1493-1502.
7. <http://www.worldbank.org/data/remittances.html#s1>.
8. IMF (2005). International Financial Statistics. CD ROM. Washington D.C.
9. IMF (2005). World Economic Outlook. Washington D.C.
10. León-Ledesma, M. and Piracha, M. (2004). 'International Migration and the Role of Remittances in Eastern Europe', *International Migration* 42 (4): 65-83.
11. McCormick, B. and Wahba, J. (2000). 'Overseas Employment and Remittances to a Dual Economy', *The Economic Journal* 110 (April): 509-534.
12. Pesaran, M. H., Shin, Y. and Smith, R. P. (1999). 'Pooled mean group estimation of dynamic heterogeneous panels', *Journal of the American Statistical Association*, 94: 621-34.
13. Schrooten, M. (2005). 'Bringin Home the Money –What Determines Worker's Remittances to Transition Countries?', Discussion paper Series A, No. 466, The Institute of Economic Research, Hitotsubashi University.

14. Straubhaar, T. (1986). 'The Determinants of Remittances: the Case of Turkey', *Weltwirtschaftliches Archiv* 122 (4): 728-40.
15. World Bank (2005). *World Development Indicators*. CD-ROM. Washington D.C.
16. World Bank (1995). *World Development Report*. Washington D.C.