International Migration and the Role of Remittances in Eastern Europe[1]

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ABSTRACT

In this paper we analyse the effect of remittances on employment performance for Central and East European (CEE) economies. We show that the impact of remittances on unemployment depends on its effect on productivity growth and investment. In order to empirically analyse the impact of remittances we estimate a productivity equation using a set of 11 transition countries during the 1990 to 1999 period. Our results show support for the view that remittances have a positive impact on productivity and employment both directly and indirectly through its effect on investment.

INTRODUCTION

The relationship between migration and development in poor countries has been a topic of debate for a long time. There are two main views. The negative view holds that international migration results in an increase in the dependency of the country of origin on remittances and, furthermore, it distorts the development process since the remittances only benefit the "lucky" few, creating wealth disparities and therefore political and economic unrest. The other view regards remittances as one of the key factors in poverty alleviation in labour-sending countries and as a good source of economic development.[2]

The unresolved debate about the positive and negative effects of remittances on countries of emigration notwithstanding, there is no doubt that the amount of remittances is a sizeable and an important source of foreign exchange for most developing countries, and Central and East European (CEE) countries are no exception.[3] Although the poorest seldom have the means to migrate, remittances have been shown to play an important role in poverty alleviation for migrant

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households and in subnational areas of out migration, especially in countries with high income and wage disparities like Albania, Bulgaria, Romania, and FYR Macedonia.

Most of the literature on the role of migration and remittances in developing countries is based on the traditional model of migration in which only long-term migration is studied (see for example, Birks and Sinclair, 1980; Gilani et al., 1981; Ebiri, 1985; Lucas and Stark, 1985; Gunatilleke, 1992; Ilahi and Jafarey, 1999). However, this has changed in a significant way since the collapse of the Soviet Union. Migration from most of the CEE countries is short term rather than long term. There are two differences between migration models that capture short-term migration and those that study the impact of long-term migration. First, short-term migrants are able to use their newly acquired skills, which, in our context, include exposure to working in a capitalist/entrepreneurship environment relatively quickly in the home country. Secondly, the main component of the migrant's savings or remitted funds from earnings abroad is not consumption[4] but rather the use of those funds in productive activities in the home country. Emigration, therefore, will have a positive effect on employment through both skill formation and increased investment through remittances.

One of the main reasons for migration from CEE countries to the European Union (EU) is the significant wage gap between the two regions.[5] Gross Domestic Product (GDP) per capita in Eastern Europe at the end of the 1980s was one-eighth of the average in Western Europe and fell by as much as 10 per cent (up to 12% in Bulgaria) by 1991. The transition process exacerbated the problems in the already beleaguered economies resulting in massive increases in unemployment rates in most of the CEE countries.[6] Therefore, for the unemployed, an alternative has been to migrate temporarily to Western Europe. This has benefits both for the individual/family and for the overall economy of the source country. At the individual level the migrant earns wages by gaining employment and acquiring skills which can enhance the migrant's chances of finding employment after returning to the home country. Benefits from migration also help overcome any capital constraints that an individual may face when starting an enterprise in the home country. The benefit to the home country is a lower unemployment level and, therefore, fewer burdens on the welfare system. In addition, returning migrants bring the much needed capital which could help the development process of the home country.[7]

The purpose of this paper is to study the macroeconomic impact of migration on selected CEE countries by analysing the contribution of return migrants to the development process after transition. As far as we are aware this is the first systematic analysis of the effect of return migration on the CEE region. In

addition, whereas previous models of migration have concentrated on the role of emigration as an alternative avenue for labour force adjustment, our paper, taking a simple theoretical framework as a starting point, empirically tests the significance of return migration as a source for economic development in the emigration countries.

It should be emphasized that this is only a starting point to analyse the behaviour of remittances and their impact on the source country economy and, therefore, our conclusions and any policy implications should be taken with caution. Furthermore, the usual argument of brain drain, which may be relevant to related migration issues, is not discussed. Nevertheless, there is empirical evidence that those potential migrants who stayed at home would have performed better if they had migrated, as compared to the ones who actually did migrate (see Co et al., 2000; De Coulon and Piracha, 2005).

We consider two particular aspects of migration: (1) the role of migration on the productivity levels of return migrants, and (2) the role of remittances on the macroeconomic performance of selected CEE countries.[8] We hypothesize that returning migrants may bring skills that contribute to economic prosperity in the home country through higher productivity levels. In addition, remittances/retained savings may be used both to finance consumption and used in productive entrepreneurial activities which contribute to wealth generation and, therefore, creation of jobs.[9] We find that an increase in the number of return migrants increases labour productivity and that remittances encourage both investment and consumption.

The rest of the paper is organized as follows: in the next section we present a brief background on migration from the CEE countries, then, the theoretical model is outlined, followed by the empirical analysis and the conclusion.

MIGRATION FROM CEE COUNTRIES: A BRIEF BACKGROUND

Central and Eastern Europe has traditionally been an area of emigration. However, between 1945 and 1990 almost all countries in the region pursued a policy of social and economic isolation, totally restricting any movement of its citizens out of its borders. Therefore, following the collapse of communism, which resulted in a significant increase in political and social tensions, a large number of people, uncertain about the economic prospects in their countries, left the region. In 1989 and 1990 most of the migration was permanent, primarily consisting of minority ethnic groups. These flows were mainly directed to Germany,

Finland, and Turkey.[10] This trend, however, lasted for a short time and permanent migration started to stabilize by 1991 and has been steadily falling since 1992.

From 1993 on, most of the migration from the CEE countries was temporary, partly because individuals primarily migrated to acquire skills and/or funds to boost their earnings at home and partly because of the restrictive policies adopted by the receiving countries. Therefore, post-1992 labour movements predominate, facilitated by the framework of intergovernmental agreements for seasonal work and subcontracted employment. 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. Hence, as a rule, movement of temporary workers is fostered by regional proximity and regulated by bilateral agreements.[11]

Most of the migration to Austria is from the Czech and Slovak Republics, generally of a limited duration of one to two years. The other big groups in Austria are Poles, Romanians, and Hungarians. Nationals of the CEE countries there account for approximately one in five of the foreign nationals in possession of a short-term work permit, but barely one in ten of those with a permanent permit (SOPEMI, 2001). The trend is similar in other EU countries, though Germany and Austria are the most affected.

It appears that the phenomenon of very short-term migration, and hence a significant level of return migration, is very common in a number of countries in Central and Eastern Europe.[12] The marked economic disparities within the region or the proximity of a relatively high labour demand area explains the frequency of short-term movements in certain frontier regions. And the existence of historic and cultural links explains the "natural" short-term cross-border movements.

THEORETICAL FRAMEWORK

In the context of our model, the potential migrant may observe growing employment at home, but higher wages at the destination given an opportunity to move abroad, with the intention of returning within a defined period. A traditional model would expect that at a time of falling unemployment at home, out-migration would decrease. However, it is reasonable to assume that the potential migrant may feel more certain about the benefits of moving if they can expect to return to local employment within a specified period and, hence, out-migration increases but so does return migration.

Moreover, it has to be recognized that where there are different job structures or economic circumstances in each region, the migrant from the relatively poorer to more developed region may perceive migration as enhancing long-term job prospects in any labour market through the acquisition of skills or experience, or through the generation of savings which can finance future self-employment through the creation of small businesses. These possibilities affect both the duration of migration and intention of return migration.

The macroeconomic gains of migration and savings/remittances on the source country can be formalized along the lines of Mancellari et al. (1996) who extended the model of Aghion and Blanchard (1994) with the addition of migration. The model will allow us to extract a set of conditions under which migration and remittances may positively affect employment. It is primarily concerned with job creation and destruction after the privatization of industries since 1990.

We assume that a person could either be employed in the private or state sector or be unemployed.[13] The option for the unemployed is either to remain in the country and earn unemployment benefits or migrate and earn wages.[14] Note that in order to concentrate on the effect of return migrants and savings/remittances on the home region, we do not consider any uncertainty in terms of potential employment in the destination region. Furthermore, we assume that a decision to migrate incorporates any cost incurred due to any unemployment period in the destination region.

Assuming that a fraction remains in the source country, we have $U^S = \alpha U$, where U^S is the number of unemployed who remain in the source country and U is the total unemployment, i.e. unemployed who remain in the source country plus those who migrated.

The value functions of an unemployed and employed are written, respectively, as follows:

$$iV^U = \alpha b + (1-\alpha)w^* + (H/U)(V^N - V^U) + dV^U/dt \quad (1)$$

$$iV^N = w + dV^N/dt \quad (2)$$

where i is the interest rate, V^U is the value of being unemployed, V^N is the value of being employed in the private sector, b is the unemployment benefit received in the home country, and w^* is the wage rate in the foreign country net of costs. H is the job creation in the private sector which depends on the gap between the average product of labour γ and the cost of labour w, which is the wage rate.[15]

(3) $H = a\,(\gamma - w)$.

where a (> 0) is a parameter. We can now interpret eq (1). The first term on the right-hand side determines the expected return on unemployment in the first period, i.e. before migration. The second term is the expected return from employment in the host country while the third term is the difference between the value of being employed and unemployed weighted by the rate of outflow from unemployment *(H/U)*. The last term is the intertemporal value of being unemployed.

Subtracting eq (1) from (2) we get the wage equation:

(4) $$w = \alpha b + (1-\alpha)w^* + k(i + H/U)$$

where $k > 0$ is the difference between V^N and V^U, and is constant.[16]

Note that the foreign wage is net of any remittances sent home to the rest of the household who had forgone consumption to finance migration. A part of remittances (and retained savings that the migrant takes home upon his return) are in turn used to establish businesses at home which, along with the proportion of unemployed who migrate, could positively affect the average product in the source country. This is given by:

(5) $$\gamma = \gamma' + \beta(1-\alpha)\,w^*$$

where γ' is the average product in the absence of migration and b captures two different aspects of migration: (a) the extent to which foreign earnings are used in financing new businesses and (b) the effect migration has on the average product of labour through skill formation.[17]

Substituting equations (4) and (5) in (3) we get the final equation:

(6) $$H = \frac{aU}{U + ak}\left[\gamma' - ik - (1-\beta)(1-\alpha)\,w^* - \alpha b\right]$$

To determine the impact of emigration on the labour market of the source country differentiate equation (6) with respect to α,

(7) $$\frac{\partial H}{\partial \alpha} = \frac{aU}{ak + U}\left[(1-\beta)w^* - b\right]$$

which is negative when $\beta \geq 1$, i.e., migration has positive impact on the labour market if it improves the average product of labour in the source country and generates investment through remittances.[18] If we consider the total effect of migration, i.e. increased productivity due to the skill formation aspect of migration and increased investment due to remittances and/or retained savings then it is reasonable to assume that $\beta > 1$.

AN EMPIRICAL ASSESSMENT

The model presented in the last section illustrates the ways in which migration and remittances can have a positive impact on employment. From there we obtained three conditions under which migration would reduce unemployment. The first condition, i.e. a high wage gap and low social protection at home, can safely be considered true for migration from CEE countries to EU countries. The second and third conditions, i.e. that returned migrants have a positive impact on labour productivity and that remittances help start new businesses, are clearly open to empirical scrutiny. In this section we analyse the impact of migration on labour productivity as well as the effect of remittances and received employees' compensation on both investment and consumption in a panel of CEE countries. This analysis has relevance even outside the context of the particular model presented here. For instance, the mere analysis of the impact of remittances on investment and consumption will contribute to test the validity of the hypothesis that remittances encourage excessive consumption and dependency.

The econometric estimates consist of a productivity equation, an investment function, and a consumption function. The productivity equation includes ten countries: Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, Slovenia, and Ukraine. The investment and consumption functions exclude Russia and include the FYR Macedonia. The exclusion of Russia is due to problems of data availability for remittances in the balance of payments. The period of estimation is 1990 to 1999. The panel is unbalanced and for many countries we could only use a few contiguous years of data. Hence, the number of observations will change depending on the variables included. The main data sources are Countries in Transition (2000) from the Vienna Institute for International Economic Studies (WIIW), the TransMONEE 2000 database from the Innocenti Research Centre of the UNICEF, and the International Labour Organization (ILO) International Labour Migration Database. A more detailed description of the variables and sources used is given in the Appendix.

Table 1 provides the results for the productivity equation. We regressed the log of labour productivity on the migration ratio, measured as the ratio of population

inflows to outflows, and a set of control variables. The MIGRAT variable is used as a proxy of the intensity of return migration. Given the temporary nature of migration in these countries, large part of the inflows are nationals returning to their country of origin. It would be desirable to have a direct measure of return migration. However, this data was not available for the countries considered and we had to use a proxy variable. We will address the problem of measurement error in this variable later in this section. According to the model, returning migrants will have a positive effect on productivity and we expect the coefficient on the migration ratio (MIGRAT) to have a positive sign.

TABLE 1

PANEL ESTIMATES OF THE PRODUCTIVITY EQUATION ($PROD_t$)

	FE	FE	FE	GMM	GMM	GMM
MIGRAT	0.005 (2.405)*	0.003 (2.286)*	0.003 (1.918)**	0.003 (1.960)*	0.003 (1.760)**	0.002 (1.695)**
IO	0.029 (7.117)*	0.024 (5.962)*	0.022 (5.436)*	0.027 (5.963)*	0.023 (4.978)*	0.019 (4.030)*
AS	0.023 (2.538)*	0.022 (2.761)*	-0.001 (-0.138)	0.026 (2.934)*	0.026 (2.975)*	-0.005 (-0.490)
FDI	3.410 (2.538)*	3.804 (2.764)*	2.845 (2.295)*	2.904 (2.393)*	3.334 (2.458)*	2.445 (1.893)**
EDU	0.033 (5.138)*	0.031 (5.125)*	0.036 (6.134)*	0.038 (5.885)*	0.034 (5.147)*	0.037 (5.955)*
OPEN		0.294 (3.021)*	0.205 (2.107)*		0.247 (2.204)*	0.227 (2.099)*
INFL			$0.277 \cdot E^{-3}$ (3.561)*			$0.365 \cdot E^{-3}$ (3.572)*
$INFL^2$			$-0.391 \cdot E^{-7}$ (-2.702)*			$-0.548 \cdot E^{-7}$ (-2.976)*
Nobs	68	68	68	64	64	64
R^2	0.963	0.968	0.974	0.967	0.970	0.976
F no eff (p-value)	57.150 (0.000)	56.866 (0.000)	67.649 (0.000)	n.a.	n.a.	n.a.
Hausman (p-value)	22.820 (0.000)	18.581 (0.005)	20.365 (0.000)	n.a.	n.a.	n.a.

Notes: (1) * and ** denote significant at the 5 per cent and 10 per cent confidence level respectively; (2) FE is the Fixed Effects estimation and GMM is the Generalized Method of Moments estimation instrumentalizing the migration variable; (3) T-ratios in parenthesis. All standard errors are White (1980) heteroskedasticity consistent; (4) F no eff. is an F-test for the null of no fixed effects in the equation; (5) the explanations of the variables can be found in the text and Appendix.

The first three columns provide the fixed effects estimates of the different specifications. As control variables we have included other relevant determinants of productivity that usually appear in growth equations. These include the investment-output ratio (IO), share of agriculture in GDP (AS), foreign direct investment flows as a percentage of GDP (FDI), and the gross enrolment rate in secondary education (EDU). All the variables are significant at the 95 per cent level and have the expected sign, except AS which has a positive and significant impact on productivity. This may be due to the fact that many of the workers in agriculture belong to the informal sector, hence contributing to output but not accounted as employed. In column two we include an openness variable (OPEN) measured as exports plus imports as a share of GDP. This variable has a positive and significant impact on labour productivity. In column three we introduced measures of inflation that account for macroeconomic uncertainties affecting growth and productivity. As in the inflation and growth literature,[19] we included inflation and inflation squared to capture the possible non-linear inverted U-shaped impact of inflation. We found this variable to also be significant and with the expected sign. Overall, all equations have a high R^2 and the estimated parameters seem robust to the inclusion of new variables with the exception of AS.[20]

The important aspect of these estimates is that the coefficient of MIGRAT remains stable and significantly greater than zero in all equations. The semi-elasticity of productivity with respect to migration seems to be robust and takes a value of around 0.003. This implies an average elasticity across the ten countries of around 0.0116. Given a standard deviation of net migration across the panel of more than 6.2, this could imply a moderately large effect. Therefore, it could be concluded that return migrants have had a positive impact on labour productivity in the last decade in CEE countries.

However, two problems may arise with this conclusion from the fixed effects estimations. First, reverse causality between productivity and the migration ratio is likely to occur. Given that productivity determines wages, and that migration flows depend on wages, among other factors, MIGRAT could be highly endogenous. Secondly, as mentioned earlier, the variable used to measure the intensity of return migration is an imperfect proxy. It is likely that this variable is subject to a large measurement error that needs to be addressed before reaching any conclusion about its effect. Measurement error in a multivariate context can, *a priori*, potentially bias the estimation coefficients of all the independent variables in an unknown direction.

We have tackled the two problems together, using instrumental variables. Following Biørn (2002), we estimated the three specifications using GMM methods. In a panel context, instruments are easier to obtain since one can use the time series dimension of the data. We carried out the GMM regressions using

the equations in levels and instrumenting MIGRAT with the first difference of MIGRAT and the rest of independent variables.[21] Columns four to six show the results. As it can be seen, the results are consistent with those using fixed effects. The main difference is that MIGRAT now appears to be less significant than before, and the inflation variables' coefficients have changed substantially. Overall, however, controlling for endogeneity and measurement error has not made a substantial difference to our previous results.

Table 2 reports the estimates of the investment function. The dependent variable is Gross Fixed Capital Formation over GDP (the investment-output ratio), excluding FDI. We want to test whether remittances contribute to an increase or a decline of investment as a share of GDP. The variable REMIT is the sum of migrant remittances and compensation of employees working abroad as a share of GDP. Hence, it includes all the *legal* economic flows generated by migrants to their country of origin. The four columns provide the results for the different control variables used. In column one we include real output growth to capture accelerator effects (YGR), the real interest rate (RR) and GDP per capita (GDPpc) to capture the effect of the level of income on investment through the generation of savings. Data on the relative price of capital is not available but, if its change is correlated with the rate of growth of output, its impact would be captured by the YGR variable. Only REMIT and GDPpc seem to be significant. In column two we separated RR into its two components, nominal interest rate (NR) and inflation, and included inflation squared to capture non-linearities as in the productivity equation. Although NR remains insignificant, we can see that both the coefficient on INFL and on $INFL^2$ are significant and suggest an inverted U-shaped relationship between investment and inflation. Finally, in columns three and four we included the effect of the agricultural share and FDI. We expect AS to have a negative impact on investment, given the labour intensive nature of this sector in the economies considered. The impact of FDI will depend on its crowding-in/crowding-out effect on domestic activities (Misun and Tomsik, 2002). We found that AS has a negative impact on IO as expected, while FDI does not have a significant effect.

Regarding the impact of REMIT, we can see that, in all cases, its coefficient is positive and significant. Its value is again robust to the choice of control variables and distributed around 0.375.[22] This is in itself an important result. We can see that in the CEE countries, migrant remittances have contributed to an increase in investment. The average investment share in these countries is 0.21, which is below the values of our point estimates of investment out of remittances income. Hence, we can see that remittances are more intensively used for the formation of fixed capital. Hence, this is also an indirect channel linking migration with productivity.

TABLE 2

PANEL ESTIMATES OF THE INVESTMENT-OUTPUT EQUATION (IO_t)

	FE	FE	FE	FE
REMIT	0.272 (2.356)*	0.461 (3.146)*	0.365 (2.590)*	0.399 (2.637)*
YGR	-0.001 (-0.763)	-	-	-
RR	0.024 (0.922)	-	-	-
NR	-	-0.014 (-1.030)	-0.015 (-1.101)	-0.015 (1.093)
INFL	-	0.026 (2.666)*	0.026 (2.985)*	0.026 (2.960)*
$INFL^2$	-	-0.002 (-3.090)*	-0.002 (-2.914)*	0.002 (2.748)*
GDPpc	0.087 (4.440)*	0.110 (5.766)*	0.101 (5.626)*	0.105 (5.712)*
AS			-0.004 (2.001)*	-0.004 (2.019)*
FDI				-0.159 (-0.924)
Nobs	66	66	66	66
R^2	0.831	0.851	0.859	0.860
F no eff (p-value)	0.000	0.000	0.000	0.000
Hausman (p-value)	0.050	0.034	0.040	0.048

Notes: (1) * and ** denote significant at the 5 per cent and 10 per cent confidence level respectively; (2) FE is the Fixed Effects estimation; (3) T-ratios in parenthesis. All standard errors are White (1980) heteroskedasticity consistent; (4) F no eff. is an F-test for the null of no fixed effects in the equation; (5) the explanations of the variables can be found in the text and Appendix.

Finally, in order to have a better grasp of the impact of remittances by expenditure component, we estimated a consumption function in which the ratio of private consumption to GDP is the dependent variable. This is reported in Table 3. We included again GDPpc and RR according to the Keynesian and intertemporal substitution models of consumption. GDPpc shows the wrong (positive) sign, although when we substitute RR by NR and INFL, it loses its significance, pointing toward a consumption smoothing process. The positive value of the nominal interest rate points out to a stronger income than substitution effect,

although the impact of inflation is not symmetric to that of NR. CO and inflation show a U-shaped relationship. Periods of moderate inflation would reduce consumption and periods of high inflation – above 6 per cent in our function – would increase it as expected. We also included the inverse of the GDPpc (1/GDPpc) in order to test for a non-linear relationship between the consumption ratio and income but, again, found it not significant. Finally, we also controlled for the growth of GDP[23] and the unemployment rate. None of these variables was found to have a significant impact on CO.

TABLE 3

PANEL ESTIMATES OF THE CONSUMPTION-OUTPUT EQUATION (CO_t)

	FE	FE	FE	FE	FE
REMIT	0.685 (2.540)*	0.631 (3.040)*	0.638 (3.048)*	0.635 (3.034)*	1.163 (3.958)*
GDPpc	0.059 (2.480)*	0.018 (0.887)	-	0.019 (0.934)	0.031 (1.350)
1/GDPpc	-	-	-1.172 (-0.899)	-	-
RR	0.006 (1.096)	-	-	-	-
NR		0.091 (5.728)*	0.090 (5.625)*	0.094 (6.146)*	0.064 (4.036)*
INFL		-0.062 (-4.885)*	-0.061 (-4.618)*	-0.066 (-5.118)*	-0.035 (-3.037)*
$INFL^2$		0.005 (4.733)*	0.005 (4.477)*	0.005 (4.996)*	0.003 (2.840)*
YGR				-0.083 (-0.875)	-
UNEMP					0.068 (0.451)
Nobs	66	66	66	66	53
R^2	0.870	0.934	0.934	0.935	0.943
F no eff (p-value)	0.000	0.000	0.000	0.000	0.000
Hausman (p-value)	0.000	0.002	0.001	0.003	0.010

Notes: (1) * and ** denote significant at the 5 per cent and 10 per cent confidence level respectively; (2) FE is the Fixed Effects estimation; (3) T-ratios in parenthesis. All standard errors are White (1980) heteroskedasticity consistent; (4) F no eff. is an F-test for the null of no fixed effects in the equation; (5) the explanations of the variables can be found in the text and Appendix.

Overall, we can see that, as in the previous cases, the impact of remittances on consumption is stable except for the results in column five. This impact is positive and has a value of around 0.647.[24] Given that the average consumption-output ration for the sample is 62 per cent, these values indicate that, contrary to what some theories suggest, remittances are not used more intensively for consumption purposes. That is, our results show that remittances are used for investment and consumption in a similar way as other income, although biased more toward investment.

Although data limitations constrain our empirical results and give little space for further analysis, our results are theoretically consistent and statistically robust. Migration in the CEE countries can potentially reduce unemployment because it has a positive impact on labour productivity and it generates economic transfers that help increasing investment in the countries of origin.

CONCLUSION

This paper is a first attempt at analysing the role of return migration and remittances in the development process of transition countries. We have argued, based on our theoretical model, that *a priori* remittances may have an important effect due to the large size of, primarily, short-term migration from CEE countries to Western Europe. Part of remittances (and retained savings that the migrant takes home upon his return) are in turn used to establish businesses at home which, along with the proportion of unemployed who migrate, could positively affect the average product in the source country. The impact of migration on unemployment would thus depend on its direct effect on productivity growth and indirectly through the use of remittances in self employment activities of return migrants.

Our econometric tests on data from CEE countries show that return of migrants has had a positive and significant effect on the productivity level of the source country. Furthermore, we find that remittances significantly contribute in increasing the investment level in the source country. We also estimated a consumption function and found it to be positively affected by remittances though the effect is not as strong as on investment. This result is quite different from the previous work on the impact of remittances in the traditional emigration countries in which consumption was by the far the biggest component of the remitted funds.

Data limitations constrain the scope of our empirical analysis. However, although the study is aggregative, the results help disentangling some interesting

stylized facts that may be of relevance when examining the role of migration on the development of transition economies.

NOTES

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2. For a more detailed discussion of costs and benefits of international migration see Finkle and McIntosh (1982), Russell (1986), and Keely and Tran (1989).
3. Total remittance credit for selected CEE countries in 1999 was US$7 billion. However, this figure is probably much lower than the real one since transfers of illegal immigrants are not included in the official calculation.
4. Most studies on the use of remittances conclude that a substantial portion of remittances is consumed rather than invested in productive activities. For reviews see Papademetriou and Martin (1991) and Taylor et al. (1996).
5. For an overview of CEEC migration and its impact on the EU, see Piracha and Vickerman (2003).
6. For instance, the unemployment rate in Bulgaria and Poland was nearly 11 per cent in 1991 and is still quite high (around 16%).
7. This is a well established fact in most of the traditional migrating countries. For example, Adelman and Taylor (1990) show that Mexico's GNP increased by at least US$2.69 for every dollar remitted or brought back from migrants earning abroad. See Taylor (1999) for a longer bibliography of studies that show positive effects of migration on countries like South Korea, Bangladesh, Sri Lanka etc.
8. Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Poland, Romania, Russia, Slovakia, Slovenia, and Ukraine.
9. Note that we are only concerned with the macroeconomic effects of migration. For an analysis of the optimal activity choice of migrants after returning, see Dustmann and Kirchkamp (2001).
10. Germany, for instance, took nearly 600,000 *Aussiedler*, primarily from Poland and Romania, whereas flows to Finland were from the former Soviet Union and the Baltic states. Turkey took a little more than 300,000 Bulgarians of Turkish origin.
11. For a more detailed analysis of this trend, see OECD (2001) and OECD Secretariat (2001).
12. For instance, nearly 90 per cent of Albanians return home after spending a few months in Greece and a similar picture emerges for Bulgarians and Croatians. Polish workers, as mentioned earlier, move to Germany on short-term contracts dictated by their employers.

13. Note that we restrict our attention to the role migration and remittances play in achieving higher investment and productivity levels in Central and East European countries. Therefore we use the option of employment in the state and private sector only to make the model tractable rather than for any analysis of flow of employment from state to private sector.
14. To keep the model tractable we assume that a person who intends to migrate has to become unemployed first. This is not a crucial assumption and relaxing it will not change the results considerably, although it will make the analysis a bit more complicated.
15. The wage rate includes the tax per employee paid by the firm.
16. This is due to efficiency wage considerations. It also implies that $dV^N/dt - dV^U/dt=0$.
17. Skills include experience of working in an efficient, market-oriented, and entrepreneurial environment.
18. In dynamic terms one can think of $(1-\alpha)$ as net migration effect, i.e. the effect of return migrants on average labour productivity. Therefore differentiating eq (6) with respect to $(1-\alpha)$ we get $(\beta-1)w^*$ which is positive for $\beta>1$ and hence migration has a positive impact on job creation.
19. See, for instance, Khan and Senhadji (2001).
20. It would have been desirable to introduce some measure of technology licensing as a determinant of productivity. However, this data was not available for our countries and, furthermore, we believe that most of the technological improvement effects would be captured by the FDI variable.
21. This proved to be a better procedure in our case than estimating the equation in differences using instruments in levels. See Biørn (2002) for a detailed explanation of these methods.
22. This implies an elasticity of IO with respect to REMIT of 0.0541, for the whole sample of countries. This impact is relatively small given that remittances have a low sample variance.
23. The growth of GDP is included as suggested by the Life Cycle hypothesis. We would expect a lower consumption-output ratio the higher the rate of growth.
24. The average elasticity of CO with respect to REMIT for all the countries is 0.0326, which is lower than that for IO.

REFERENCES

Adelman, I., and J.E.Taylor
1990 "Is structural adjustment with a human face possible? The case of Mexico", *Journal of Development Studies*, 26: 387-407.

Aghion, P., and O. Blanchard
1994 "On the speed of transition in central Europe", Discussion Paper in Economics no. 87, Nuffield College, Oxford.

Biørn, E.
2002 "Handling measurement error by means of panel data: moment methods applied on firm data", in B.P. Stigum (Ed.), *Econometrics and the Philosophy of Economics*, Princeton University Press, Princeton.

Birks, J.S., and C.A. Sinclair
1980 "International migration and development in the Arab region", ILO, Geneva.

Co, C., et al.
2000 "Returns to returning", *Journal of Population Economics*, 13(1): 57-79.

De Coulon, A., and M. Piracha
2005 "Self-selection and the performance of return migrants: the source country perspective", *Journal of Population Economics*, forthcoming.

Dustmann, C., and O. Kirchkamp
2001 "The optimal migration duration and activity choice after re-migration", IZA Discussion Paper 266, Institute for the Study of Labor (IZA), Germany.

Ebiri, K.
1985 "Impact of labour migration on the Turkish economy", in R. Rogers (Ed.), *Guests Come to Stay: The Effects of European Labour Migration on Sending and Receiving Countries*, Westview, Boulder.

Finkle, J., and C. McIntosh
1982 "The consequences of international migration for sending countries in the third world", *Report for the Bureau of Policy and Program Coordination*, USAID, Washington, D.C.

Gilani, I., et al.
1981 "Labour migration from Pakistan to the Middle East and its impact on the domestic economy", *Final Report, Research Project on Export of Manpower from Pakistan to the Middle East*, World Bank, Washington, DC.

Gunatilleke, G.
1992 *The Impact of Labour Migration on Households: A Comparative Study in Seven Asian Countries*, United Nations University Press, Tokyo.

Ilahi, N., and S. Jafarey
1999 "Guestworker migration, remittances and the extended family: evidence from Pakistan", *Journal of Development Economics*, 58: 485-512.

Keely, C., and B.N. Tran
1989 "Remittances for labour migration – evaluations, performance and implications", *International Migration Review*, 3: 500-525.

Khan, M.S., and A.S. Senhadji
2001 "Threshold effects in the relationship between inflation and growth", *IMF Staff Papers*, 48: 1-21.
Lucas, R.E.B., and O. Stark
1985 "Motivations to remit: evidence from Botswana", *Journal of Political Economy*, 93: 901-916.
Mancellari, A., et al.
1996 "Job creation and temporary migration: the case of Albania", *The Economics of Transition*, 4: 471-490.
Misun, J., and V. Tomsik
2002 "Does FDI crowd in or crowd out domestic investment?", *Eastern European Economics*, 40: 38-56.
OECD
2001 *Trends in International Migration*, SOPEMI, Paris.
OECD Secretariat
2001 "Trends in migration flows in Central and Eastern Europe", in *Migration Policies and EU Enlargement: The Case of Central and Eastern Europe*, OECD, Paris.
Papademetriou, D.G., and P.L. Martin
1991 *The Unsettled Relationship: Labour Migration and Economic Development*, Greenwood, New York.
Piracha, M., and R.W. Vickerman
2003 "Immigration, labour mobility and EU enlargement", in C. Jenkins and J. Smith (Eds), *Through the Paper Curtain: The Insiders and Outsiders in Europe*, Chatham House Papers, Blackwell Publishers, London.
Russell, S.
1986 "Remittances from international migration: a review in perspective", *World Development*, 14: 677-696.
Taylor, J.E.
1999 "The new economics of labour migration and the role of remittances in the migration process", *International Migration*, 37: 63-88.
Taylor, J.E., et al.
1996 "International migration and community development", *Population Index*, 62: 397-418.
White, H.
1980 "A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity", *Econometrica*, 48: 817-838.
WIIW (The Vienna Institute for International Economic Studies)
2000 *Countries in Transition 2000*, The Vienna Institute for International Economic Studies, Vienna.
UNICEF Innocenti Research Centre
2000 *TransMONEE 2000 database*, UNICEF-IRC, Florence, Italy.

APPENDIX

The definition and source of the variables used for estimation are as follows:

PROD: the log of the GDP measured in constant 1990 US$ per total employment. Source: WIIW (2000).
MIGRAT: measured as total (employed and non-employed) population inflows over outflows. Source: ILO, International Migration Database.
IO: Gross Fixed Capital Formation in current US$ over GDP in current US$. Source: WIIW (2000).
AS: share of agriculture gross value added in total gross value added. Source: WIIW (2000).
FDI: total FDI inflows over GDP (both in current US$). Sources: UNICEF Innocenti Research Centre (2000) and WIIW (2000) where data from the former was not available.
OPEN: current exports plus imports in US$ over current US$ GDP.
EDU: percentage of persons enrolled in secondary education over total population. The gross enrolment rates are based on the number of students, regardless of age, enrolled in general upper secondary education, divided by the total number of the population that corresponds to the age group specified for this level of education, typically age 15 to 18. Source: UNICEF Innocenti Research Centre (2000).
INFL: annual average percentage change of the consumer price index. Sources: UNICEF Innocenti Research Centre (2000) and, where not available, WIIW (2000).
NR: is the average lending rate of the financial system. For Romania the refinancing rate of the National Bank of Romania was used. Source: WIIW (2000).
RR: NR – INFL.
CO: is the share of private domestic consumption on GDP both measured in current US$.
REMIT: workers' remittances plus compensation of employees received from abroad – as defined in the UN Balance of Payments statistics – over GDP, both measured in current US$. For some cases we used the item "private transfers" when workers' remittances was not explicitly available. Source: WIIW (2000) based on IMF statistics.
UNEMP: is the average rate of registered unemployment per total labour force. Source: UNICEF Innocenti Research Centre (2000).

LA MIGRATION INTERNATIONALE ET LE RÔLE DES RAPATRIEMENTS DE FONDS EN EUROPE ORIENTALE

Nous analysons dans cet article l'effet des rapatriements de fonds sur la situation de l'emploi dans les économies d'Europe centrale et orientale. Nous montrons que l'impact des rapatriements de fonds sur le chômage dépend de leurs effets sur l'augmentation de la productivité et l'investissement. Pour analyser de manière empirique l'impact des rapatriements de fonds, nous posons une équation de productivité pour un ensemble de 11 pays en transition pendant la période 1990-1999. Nos résultats viennent étayer l'idée que les rapatriements de fonds ont un impact positif sur la productivité et l'emploi tant directement qu'indirectement, par leurs effets sur l'investissement.

MIGRACIÓN INTERNACIONAL Y LA FUNCIÓN DE LAS REMESAS EN EUROPA ORIENTAL

En este artículo se analiza el efecto de las remesas en el rendimiento del empleo para las economías de Europa central y oriental. Ello demuestra que la repercusión de las remesas en el desempleo depende de su efecto en el crecimiento de la productividad y de las inversiones. A fin de analizar empíricamente las repercusiones de las remesas, se establece una ecuación de productividad utilizando para ello una serie de 11 países con economías en transición durante el periodo comprendido entre 1990 y 1999. Los resultados obtenidos corroboran que las remesas repercuten favorablemente, ya sea directa o indirectamente, en la productividad y en el empleo a través de su efecto en las inversiones.