

# THE VOLUME AND GEOGRAPHY OF REMITTANCES FROM THE EU<sup>1</sup>



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## Executive Summary

Literature on remittances flows has flourished in recent years. Remittances have become an increasing source of external funding for many countries with important impacts on their development, redistribution and, in particular, poverty reduction. According to World Bank figures, remittances are estimated at more than 170 billion US-dollars in 2005. This impressive amount means that flows of remittances not only exceed Official Development Aid (ODA) but they come also close to Foreign Direct Investment (FDI), representing the second largest source of external funding for developing countries (Ratha 2001). The welfare benefits of remittances are reviewed in Ratha (2001). He clearly sums up the evidence found on this topic in reducing poverty and increasing financial stability in recipient countries. Remittances increase the recipient individual's income and increase the recipient country's foreign exchange reserves. If they are invested they contribute to output growth and if they are consumed, they also generate positive multiplier effects. Moreover, they may help economic stabilisation, since there is evidence that they are more stable than other sources of external finance or even counter-cyclical relative to the recipient economy (Ratha and Riedberg, 2005).

While the true value of remittances is huge in the aggregate, remittance transactions are of small individual size and the transmission channel is, many times, an informal one. Therefore, the true value of remittances is very difficult to estimate. The scarcity and inaccuracy of official data and the inexistence of credible estimations (i.e. survey data) about remittances flows through informal channels are the main problems. In an effort to improve official statistics on remittances, the World Bank jointly with the International Monetary Fund, are leading a working group to better record remittances in national statistics. In the short-term, they are trying to get a better grasp of the extent of remittances by surveying Central Banks (WB, 2006). The European Commission Statistical Office of the European Community is also working on this subject. The Luxembourg Group is conducting a Second Special Survey on remittances of Member States while they are working on a guidance for collecting and processing this kind of data (Eurostat,2006). However, we believe that this effort must be combined with large scale individual remittances surveys.

The main purpose of this analysis is to complete the figures reported by official statistics trying to account both for the volume coming from formal as well as from informal channels. We estimate bilateral workers' remittance flows from the 27 European (EU) countries, to all (the relevant from the immigration perspective)

countries in the world. We address simultaneously the total volume and the geographical breakdown of remittances flows. In order to cover these purposes, we try to improve the methodology previously employed paying attention to model observed and unobserved heterogeneity in estimating disposable income and the propensity to remit.

We have estimated in this study both the volume and geographical breakdown of remittance flows from EU-27 to the rest of the world and within EU countries. In order to have a complete figure of the ways of remittances from the EU, we have faced a very important problem concerning data availability. We have proposed an unused methodology to account both for the lack of data as well as for the identification of remittance flows through informal channels. We believe that practically every single number obtained from the analysis can be improved in case better data (especially survey data) becomes available. Under these circumstances, all the results we get should be taken with caution.

The main results suggest that total remittance flows have been continuously increasing during the last five years. The evolution of the foreign population in the host countries is the most important determinant of remittances. In our most realistic scenario immigrants remit 18.7 billion of Euros to countries outside EU27 that accounts for more than 80 percent of total remittances from EU27. In this, say, medium scenario total remittance flows outside EU27 represents almost 16 percent of worldwide worker's remittances for that year, estimated by the World Bank at 160 billions of USD (129 billions of Euros of 2004). On average, EU15 remits in 2004 between 0.15 and 0.20 percent of its GDP depending on the assumption used to estimate the propensity to remit. Five countries (United Kingdom, Germany, Spain, France and Italy) concentrate more than 80 percent of total remittances from EU27. According to our estimations the main corridors from EU27 in year 2004 are France-Morocco; Germany-Turkey; Spain-Morocco; Spain-Ecuador; France-Algeria; France-Tunisia, Spain-Colombia, UK-Pakistan, UK-India, Germany-Afghanistan and Italy-Albania. Remittance flows increased from €25.3 billion in 2004 to €26.7 billion in 2005. This result is mainly driven by the evolution in the number of immigrants (20 MM in 2004 to 22 MM in 2005). Spain is the country with the highest growth in the number of immigrants between 2004 and 2005 and total remittances amounted to almost €5.0 billion. This figure represents 16 percent more than the corresponding figure for 2004 (€4.3 billion).

As a by-product, this report also emphasizes the need to improve data measurement. Most of the estimations can be improved if better data is available.

Improving information and data sharing with remittance transfer companies and harmonizing remittance definition between countries can help substantially to better analyze remittance flows and understand their potential effect in recipient countries.

## 1. Introduction

Literature on remittances flows has flourished in recent years. As remittances became an increasing source of external funding for many countries, the World Bank (WB), the International Monetary Fund (IMF), the European Commission (EUC) and National Financial Institutions have increased their interest on this topic. Remittances, along with migration, have increased markedly in recent years in a way such that the issue has become of great importance, especially for poor and developing countries. According to WB figures, remittances are estimated at more than 170 billion US-dollars in 2005. This impressive amount means that flows of remittances not only exceed Official Development Aid (ODA) but they come also close to Foreign Direct Investment (FDI), representing the second largest source of external funding for developing countries (Ratha, 2001). The welfare benefits of remittances are reviewed in Ratha (2001). He clearly sums up the evidence found on this topic in reducing poverty and increasing financial stability in recipient countries. Remittances increase the recipient individual's income and increase the recipient country's foreign exchange reserves. If they are invested they contribute to output growth and if they are consumed, they also generate positive multiplier effects. Moreover, they may help economic stabilisation, since there is evidence that they are more stable than other sources of external finance or even counter-cyclical relative to the recipient economy (Ratha and Riedberg, 2005).

In the above framework, the construction of a proper estimate of transfer flows from the EU to the rest of the world, in particular developing countries can be very important. It would allow enhancing efficiency in the implementation of EU policies on remittances and immigration as a whole, and, why not, Official Development Aid. Moreover, the quantification is also important in order to understand their impact on development, redistribution and, in particular, poverty reduction. Therefore, designing appropriate policies should require considerable efforts to improve data and analyze socioeconomic impact of migration and remittances. Consequently, the role of remittances in reducing poverty has been again put forward by academics and policy makers (e.g. Rapoport and Docquier, 2003). It should be combined with other instruments in pursuing objectives for developing countries which can be improved with a better knowledge of the whole mechanism and then designing and implementing different policies. Indeed, despite the challenges that researchers face on this field of study, their findings support that remittances have a positive impact on development and poverty reduction (Adams and Page, 2005).

While the true value of remittances is huge in the aggregate, remittance transactions are of small individual size and the transmission channel is, many times, an informal one. Therefore, the true value of remittances is very difficult to estimate. The scarcity and inaccuracy of official data and the inexistence of credible estimations (ie. survey data) about remittances flows through informal channels are the main problems. In an effort to improve official statistics on remittances, the WB jointly with the IMF, are leading a working group to better record remittances in national statistics. In the short-term, they are trying to get a better grasp of the extent of remittances by surveying Central Banks (WB, 2006). The European Commission Statistical Office of the European Community is also working on this subject. The Luxembourg Group is conducting a Second Special Survey on remittances of Member States while they are working on guidance for collecting and processing this kind of data (Eurostat, 2006). However, we believe that this effort must be combined with large scale individual remittances surveys.

The EU Commission published, by the end of 2006, the Second EU survey on workers' remittances from the EU to third countries. Although the survey is only a collection of official data available in Member States rather than a survey in a proper sense, it is a first step in order to increase the quality of remittances data inside EU countries. *"The survey shows that remittances from the EU to third countries increased from €6.2 billion in 2000 to almost €9 billion in 2004"* (ECFINDA, 2006). However, the results of the survey infra-estimates the true value of the remittances flows sent from the EU. *"These results of the survey may be distorted by problems of underreporting and misreporting. These problems arise for three main reasons: 1) lack of reporting by some member states; 2) heterogeneous concepts and methods of collection and estimation, and 3) the general difficulty of capturing certain remittances flows, especially the ones sent through informal channels"* (ECFIND4, 2006).

The purpose of this study is to complete the figures reported by official data while accounting in our simulations for remittances through informal channels. We estimate bilateral workers' remittance flows from the 27 European Countries, to all (the relevant from the immigration perspective) countries in the world. The study will address simultaneously two lines of enquiry: the total volume and the geographical breakdown of remittances flows. We considered as destination countries all the countries of the world except those suffering from serious data problems or lack of sample size that impede any estimation of reliable remittance flows.

For the purposes of this study, *remittance flows are defined widely as total private cross-border transfers from foreign persons living or working in the EU to their*

*countries of origin*. Cross-border transfer providers are defined widely, including in kind, cash, banks, postal services, and wire services as well as non-registered remittance systems. This definition comprises recorded and unrecorded flows. It is well documented that the true value of remittances flows is likely to be much higher than the amount recorded by the official statistics. According to the WB (2006) informal remittances may increase by 50 percent official statistics.

The task that we propose in this project is quite challenging because, in addition to the general problems (reported by the W, 2006, for instance), there are some EU-specific causes that impede reliable and comparable figures on remittances (Hallet, 2006), such as different definitions, intra-EU flows (commuting, seasonal work), no legal obligation to report on workers' remittances, the €12,500 reporting threshold for anti-money laundering and informal channels, and differences in data collection and reporting at different countries. In fact, while some studies are still based on data of the Balance of Payment Yearbook provided by the IMF, it is now widely acknowledged that remittances recorded in the recipient countries' balance of payments statistics grossly underestimate the actual level of remittances (Ghosh, 2006).

Our methodology partially follows standard accounting methodology. However we introduce some innovations trying to improve measurement of remittances coming both from formal and informal channels. Firstly, we give more attention to observed heterogeneity, especially in the estimation of disposable income and the propensity to remit. Secondly, we follow a sequential procedure in which we first trained the model for those countries with better data and then extended it to the rest of the countries. We believe that both the richer modelling and the sequential procedure allow us to better understanding the mechanism of remitting as well as to provide more accurate figures of the volume of remittances. We are, of course, aware that any statistical model cannot completely capture either unobservables affecting the propensity to remit or the absence of data about origin, destination or unrecorded ways of remitting. This means that, in our opinion, using the methodology proposed, any figure provided is susceptible of improvement with access to better data. Availability of better data than actual data is very important for the decision making process of EU authorities. It would allow enhancing efficiency in the implementation of EU policies on remittances and immigration as a whole and official development aid. Moreover, the accurate quantification is also very important to understand the impact of remittances on development, redistribution and poverty reduction in the destination countries. Therefore, the design of appropriate policies should require considerable efforts to improve data in order to be able to analyze the socioeconomic impact of remittances

and migration on the development, redistribution and poverty targets.

The rest of the report is organized as follows. In section 2 we review the literature. We next provide a tentative theoretical framework to understand individual remittances. This simple model also allows us to justify our procedure to estimate the propensity to remit. It follows section 4 that explores the link between theory and data. Section 5 shows the main results from the analysis, some explanations about them and about discrepancies to other sources of information as well as future trends on the issue.

## 2. Literature review

There has been a large body of theoretical and empirical literature in relation to the subject, both applying micro level and macro level perspective. Theoretical micro-level perspective has been focus on remittance motives. These models have been combining into three groups depending on remittances main determinants: “*pure altruistic models*”, “*pure self-interest models*” and “*tempered altruism or enlightened self-interest*” (Lucas and Stark, 1985).

In the altruistic framework (Becker, 1974) the individual obtains utility from his/her own consumption and from the consumption of other members of their family. In an immigration context, altruism may be a significant motivation for transfer income to relatives (Lucas and Stark, 1985). In contrast to altruism, self-interest is also a motivation to remit. In this case, investment for the future is the most important motive. A less extreme view (“*tempered altruism or enlightened self-interest*”), try to model a situation in which all members of the family establish beneficial agreements. Both, the family and the migrant, benefit from migration through an implicit contractual arrangement. In this case, a migrant sends remittances home as repayments to the family (or any other lender) who finance migration first (Ilahi and Jafarey, 1999, Poirine, 1997), as the result of intergenerational transfers (Lucas and Stark, 1985), as a way to reduce family income risk (Stark, 1991), and as a payment for services provided by family members (Cox, 1987, Cox, Ester and Jimenez, 1998). In the last case, remittances are interpreted in the context of the new economics of labour migration (NELM). Migration and remittances are part of the overall family/household decision making process. Rapoport and Docquier (2005) provide an excellent review of theoretical models.

The macroeconomics of remittances, especially on the determinants of remittances is much less rich (Connell/Conway 2000, Martin 1990, Glytsos 1997, McCormick/Wahba 2000, Djajic 1986, Quibria 1996, Taylor et al., 1996, Taylor, 1999, Martin, 1990, Boone, 1995). In general, the literature considers remittances in a similar way as they consider other international flows. They focus mainly on the impact of remittances on the current account. Remittances increase external foreign exchange and they may have a positive impact on the recipient economy output and development. (Connell/Conway 2000). However, authors have different opinions about their effects. While one group of authors argue that remittance flows have a positive effect on the domestic economy, other strand of the literature (Martin, 1990) focus on the negative incentives that remittances might have on domestic policy. According to these authors a high dependency on remittance flows might decrease the incentives for creating an efficient domestic institutional framework. Bringing together the pros and cons of remittances, McCormick and Wahba (2000) believe that the impact of remittances on economic development depends on the domestic policy.

In the empirical framework, macro studies usually focus on the economic situation in the host and home country. The exchange rate, the relative interest rate, the institutional instability and the financial sector development are found as remittance flows determinants. Although there is no strong consensus about the *determinants* of remittances, the stock of active immigrants is seen as the main determinant in most of them (Freund and Spatafora, 2005).

While the consensus of empirical studies on the remittances determinants is not strong, the consensus of the empirical studies on the positive impact of remittances on the home country have increased in recent years (WB, 2006; IMF 2005, León-Ledesma/Piracha, 2001/2004). All of them have agreed that the main problems to obtain robust empirical results are both the lack and scarcity of the data. Recent efforts to improve data and empirical analysis are from OECD Harrison et al (2004), the GMig2 Data Base of Bilateral Labour Migration, Wages and Remittances of Walmsley et al. (2005), and more recently Freund and Spatafora (2005) and Ratha (2005).

The study by Freund and Spatafora (2005), commissioned by the WB for the Global Economic Prospects 2006 (WB, 2006) estimates the coefficients of some commonly identified determinants of remittances like per capita income in the host and origin country, the stock of migrants in the host country, the fee to be incurred when sending an amount of 200 US\$, and finally, the exchange rate spread. A dummy variable is included to control for capital account restrictions (dual exchange rates).

Using the coefficients on these variables, Freund and Spatafora (2005) predict what remittances would be if the values of these variables become closer to those prevailing in regions where informal flows are known to be small. The difference between these predicted remittances and the actual remittances are interpreted as an estimate of informal flows. Globally, their estimates suggest that informal remittances may range between 35 and 75 percent of official flows. In countries with well-functioning financial systems, large and regular users tend to send remittances through formal channels. This acts to put a bound on the size of the informal sector. On the other hand, in some countries, and especially those with large exchange-rate spreads, the informal sector may be much larger than the above average. However, the great disadvantage of this study for our relevant purposes is that it does not allow for a geographical breakdown of remittance flows.

The study by Ratha and Shaw (2005) reports preliminary results from an ongoing effort to improve data on bilateral migration stocks and sets out some working hypothesis on the determinants and socioeconomic implications of South-South migration drawing on a survey of the literature. They conclude that South-South migration is nearly as large as South-North migration (74 million of people). In 2005 they estimate that two of every five migrants were residing in a developing country. Most of them have come from other developing country and seemed to take place between contiguous borders and between countries with relatively small differences in income.

An updated and augmented bilateral migration matrix originally created by the University of Sussex for 162 countries (Persons et al., 2005) was used for the empirical estimation on the extent migration between developing countries. The database uses national censuses, population registers, national statistical bureaus data and a number of other secondary sources. The authors point out the problems found to correctly estimate the migration matrix such as irregular migration and they believe that the reported results underestimate the global migrant stocks.

Ratha and Shaw (2005) also report preliminary estimates of South-South remittances that range from 18 billion of dollars and 55 billion of dollars in 2005, depending on the allocation rule chosen to estimate bilateral flows. The estimate is higher when the estimation rules are based on migrant stocks and lower when the estimation rule is based on migrant incomes. The authors point out the weaknesses of the data used to estimate remittances. They state: "*Data on bilateral remittances are for the most part not available. Even when these are reported, they may not be accurate, because funds channelled through international banks may be attributed to*

*a country other than the actual source country (Ratha, 2005). Migration data, especially in developing countries but also in the high-income non OECD countries, are in need of serious overhaul in terms of availability, timelines, quality, and cross-country comparability*". However, they consider the database used as the most comprehensive one available at that moment.

With regard to the allocation rules used by Ratha and Shaw (2005) to estimate bilateral remittances we believe that they better improve the work done before but still have some caveats. The most simplistic scenario assumes that "a country's remittance receipts from various countries are proportional to its migrants stocks in those countries". Using this rule South-South remittances would amount 55.4 billion of dollars. As the authors recognize this rule overestimates remittance flows since does not take into account differences between immigrants (age, sex, tenure, income, etc.). Migration is a precondition for remittances. However, they are not totally correlated. The second scenario *"uses income levels as weights (using as a proxy per capita income in PPP terms in destination country multiplied by the number of migrants)*." The estimate for South-South remittance drops to 17.5 billion of dollars in this scenario. Underlying this rule there are strong assumptions: all migrants send a fixed fraction of their income regardless of their income level and consumption needs. Finally, the third scenario assumes that *"the amount sent by an average migrant increases with migrants income, but at a decreasing rate"*. They use per capita GNI as a proxy for the migrant's income abroad. Using this scenario remittance flows amount 34.3 billion of dollars. The problem with this assumption is that immigrants, in general, do only perceive labour income and using GNI in the estimations may overestimate immigrant's earnings.

Finally, to our knowledge, only two recent studies used aggregated bilateral data to estimate determinants of workers' remittances (Schiopu and Siegfried, 2006, and Lueth and Arranz, 2006). Schiopu and Siegfried (2006) created a new dataset containing information on bilateral remittance flows from 21 EU countries to 7 EU Neighbouring Region (ENR) countries and investigated influencing factors on the average remittance by migrant. The remittance data were matched with migration data from OECD (2002), resulting in a dataset of 97 pairs and 264 observations.

Lueth and Arranz (2006) estimate a gravity model of workers' remittances using bilateral data. They found that remittances flows are procyclical; therefore remittance flows tend to falter when exports weaken and GDP growth slows. They also decline when the home country depreciates. The authors also find a positive association between remittances receipts and dependency ratio in the home country

and between remittances receipts and inflation in the home country. They create a dataset of bilateral remittance flows for a limited set of 33 developing countries with significant remittance and 11 recipient countries: Bangladesh, Croatia, Indonesia, Kazakhstan, Macedonia, Moldova, Philippines, Serbia y Montenegro, Slovenia, and Tajikistan y Thailand. Variety of sources was used by the authors, including the International Transaction Recording System (ITRS), migrant surveys and statistics, as well as statements and surveys of banks and money operators (Lueth and Arranz, 2006).

A second strand of the literature has used survey data to study the microeconomic determinants of remittances (Gubert, 2002, Amuedo-Dorantes and Pozo, 2006, Holst and Schrooten, 2006). The main problems with these surveys are the sample size and the impossibility to extrapolate the results to other countries or regions. Different econometric techniques were used to estimate remittance determinants (from ordinary least squares (OLS) to Tobit and Heckman two-stage models). Migrant income, gender, length of stay in the host country and the size of the household are found significant variables to explain remittances from an altruistic motive. However, education and the income level of the migrant and his family are the main determinants of remittances. Pure self-interest motives were measured in looking at the effect of remittances on home country household wealth and on the intent to return home (Luckas and Stark, 1985, Brown, 1997, De La Briere, 1997). Luckas and Stark (1985) found that sons in Bostwana remit more to families that have large herds and if the household has a larger income. Brown (1997) found a positive correlation between intend to return home and remittances. Amuedo and Pozo (2006) measured the insurance motive. They found that those immigrants with greater income risk remit more. Almost all the authors found a positive relationship between the migrant's education level and remittances, which provides evidence for the loan repayment motive.

While the conventional approach to analyse the impact and determinants of remittances uses officially recorded remittances, it is widely known that these figures under-record total remittances amounts. In an effort to account for unrecorded remittances, survey based micro-level data was combined with official statistics for different countries (Mahmud, 1989, Adams, 1991, ESCAP, 1986, Kazi, 1989, Tan and Canlas, 1989, Brown, 1995, Rodrigo and Jayatissa, 1989, Browns, 1992, Tingsabadh, 1989). The degree of under recording varies from country to country. However, according to the WB (2005) informal remittances may increase, in average, 50 percent the figures in official statistics. One of the problems of combining official data and survey data is that survey data may not be representative of the population. Table 1

below shows a summary of the main results found in these studies.

**Table 1: Unrecorded remittances as a percentage of total remittances**

Remittances destination	Source	Estimation Period	Informal remittances as % of total estimated remittances
Bangladesh	Mahmud (1989)	1981-86	20%
Korea	Hyun (1989)	1980-85	8%
India**	ESCAP (1987)	1983	40%
Egypt	Adams (1991)	1985-86	33 %
Philippines	Alburo, Abella(1992) Tan & Canlas (1989)	1990-92	50%- 55%
Pakistan	ILO-ARTEP (1987)	1986	43%
Sri Lanka	Rodrigo and Jayatissa (1989)	1980-85	13%
Sudan	Choucri (1984)	1984	85%
Thailand	Tingrabadh (1989)	1977-86	18%
Tonga	Brown and Connell (1993b)	1992-93	43%
Western Samoa	Brown and Walker (1994)	1992-93	42%

Source: Shivani Puri and Tineke Ritzema (1999)

### 3. Theoretical framework

#### 3.1. General context

From previous work we know that remittance flows may arise by a combination of factors, from altruistic to self-interest motives. A lot of work has been done to better understand what motivates individuals to transfer income to relatives in their origin country.

In the altruistic framework (Becker, 1974) the individual obtains utility from his/her own consumption and from the consumption of other members of their family. In an immigration context altruism may be a significant motivation for transfer income to relatives (Lucas and Stark, 1985). Other theories view remittances as the results of intergenerational contracts (Stark, 1981), as partial insurance against income shocks (Agarwal and Horowitz 2002, Gubert, 2002), or as repayments to their families who help the immigrant in a first moment (Poirine, 1997, Ilahi and Jafarey, 1999).

In order to be able to better understand the determinants of remittances flows, we frame the estimation of remittances inside an altruistic framework. We formulate a very simple one period model, in which we assume the existence of a representative individual, migrant from country  $r$  to country  $c$ , who works in the destination country  $c$  and have to allocate income between his own consumption in country  $c$  ( $C_i$ ) and income transfers to their family in country  $j$  ( $R_{ij}$ ) given his/her disposable income ( $W_i$ ).

The immigrant's family consume from the transfer received ( $C_j$ ). The immigrant obtains utility from  $C_i$  and from  $C_j$  according to the altruistic coefficient ( $\omega$ ). The immigrant's family face a budget constraint given by their own disposable income ( $W_j$ ) and the remittances they receive ( $R_{ij}$ ).

In this setting, the migrant's optimization problem can be expressed as follows:

$$\underset{C_i, C_j}{\text{Max}} \{ u(C_i) + \omega u(C_j) \} \quad (1)$$

Subject to

$$W_i = C_i + \pi R_{ij}, \quad (2)$$

where  $\pi = (1 + \partial)$  and  $\partial > 0$ ,

$$C_j = W_j + R_{ij} \quad (3)$$

In order to solve the problem we assume a logarithmic utility function that fulfills all the properties needed and ensures an interior solution for  $C_i$ . The Lagrangian of problem (1) - (3) can be expressed:

$$L = \text{Log}(C_i) + \omega \text{Log}(W_j + R_{ij}) + \lambda(W_i - C_i - \pi R_{ij}) \quad (4)$$

We get the following first order conditions for the two arguments in (4):

$$(C_i) \quad \frac{1}{C_i} - \lambda \leq 0, \quad C_i \geq 0 \quad (5)$$

$$(R_{ij}) \quad \frac{\omega}{(W_j + R_{ij})} - \lambda \pi \leq 0, \quad R_{ij} \geq 0 \quad (6)$$

Given that a logarithmic transformation of the utility function ensures an interior solution for  $C_i$ , we get  $\frac{1}{C_i} = \lambda$ . Moreover, the solution for  $R_{ij}$  is interior only if

the degree of altruism ( $\omega$ ) is sufficiently large, that is if  $\omega > \pi \frac{W_i}{W_j}$ . Making the

assumption that  $R_{ij}$  is also interior at the optimum, we can express  $C_i$  and  $R_{ij}$  as functions of the parameter of altruism ( $\omega$ ,) and wages at the destination and origin ( $W_i$  and  $W_j$ ):

$$R_{ij} = \frac{\omega}{(1+\omega)} \frac{W_i}{\pi} - \frac{1}{(1+\omega)} W_j \quad (7)$$

$$C_i = \frac{1}{(1+\omega)} (\pi W_j + W_i) \quad (8)$$

### 3.2. A particular case

In order to have a manageable model for estimating remittances' determinants we need to simplify even more the above model given we do not observe consumption of the relatives in the country of origin of the immigrant. Therefore, we assume an altruistic immigrant that obtains utility from his own consumption and from the remittances he/she sent. The immigrant decides how much to allocate to consumption and how much transfers he/she does to his/her family.

The maximization problem is defined as follows:

$$\underset{C_i, R_{ij}}{\text{Max}} U_i = C_i^{(1-\beta)} R_{ij}^\beta \quad (1')$$

$$\text{s.t. :} \quad W_i = C_i + R_{ij} \quad (2')$$

where,  $C_i$  is the immigrants' consumption,  $R_{ij}$  is the remittance flow from immigrant  $i$  to his family;  $W_i$  is the immigrant disposable income and  $\beta$  is a coefficient. The Lagrangian of the problem is now:

$$L = C_i^{(1-\beta)} R_{ij}^\beta + \lambda(W_i - C_i - R_{ij}) \quad (4')$$

and the first order conditions are now given by:

$$(C_i) \quad \frac{\partial L}{\partial C_i} = (1-\beta) \left( \frac{R_{ij}}{C_i} \right)^\beta = \lambda \quad (5')$$

$$(R_{ij}) \frac{\partial L}{\partial R_{ij}} = \beta \left( \frac{C_i}{R_{ij}} \right)^{(1-\beta)} = \lambda \quad (6')$$

From (5'), (6') and (2') we obtain:

$$R_{ij} = \beta W_i \quad (7')$$

$$C_i = (1 - \beta) W_i \quad (8')$$

These expressions are now based on observables and allow us to develop an empirical specification for adjusting the propensity to remit ( $\beta$ ) of the immigrants that we develop in section 4.3. Since we can interpret  $\beta$  as the propensity to remit out of disposable income, which is the parameter we are interested in, we are able to link this simple model and the empirical specification used to estimate  $\beta$ . We will also allow some variables to condition the evolution of this parameter along time and its distribution across individuals and, as a result, the interpretation of their coefficients is straightforward.

## 4. Transition to empirical work

The methodology applied to estimate total remittances combines procedures used by different authors and different datasets. To do that, we assume a representative immigrant (except that we account for some demographic differences across countries as mentioned) and we use bilateral data on remittances and immigrants to find the determinants of the propensity to remit. As usual in this kind of studies, we have to face the important problem posed by the existence of informal remittances flows. Once we estimate immigrant's behaviour towards remittances we are able to recover the total amount of remittances flows. To the best of our knowledge, this is the first time in estimating the determinants of the propensity to remit at a first stage, and then using the obtained estimates to derive an approximation to the true value of remittances flows from EU to all countries outside and within the EU.

The methodology applied in linking different datasets is similar to that of synthetic panel estimation. The combination of information obtained from different

datasets was used by different authors in different economic contexts (see for instance, Arellano and Meghir, 1992, or Boldrin and Jimenez-Martín, 2006).

#### 4.1. Data sources

To date, the inaccuracy and scarcity of bilateral data is one of the main shortcomings to study workers' remittance flows. The IMF Balance of Payments statistics is one of the main sources of remittance data but it does not provide a breakdown by country of origin and infra-estimates the true value of remittance flows. Data on bilateral remittances are as a rule not available. But, even if they were reported, they may not necessarily be accurate. Funds channelled through international banks may be attributed to a country other than the actual source country (Ratha, 2005). In an attempt to estimate total remittance flows, researchers have used bilateral migrant stocks and assume different remittance behaviours of immigrants.

Since a good estimation of total EU remittance is not possible using a single source of data we combine various data sources. The key pieces of information are the National Balance Sheet of Payments statistics, the Second EU Survey on worker's remittances from the EU to third countries, surveys based on micro-level data, and data from various other less important sources. Combining micro-level data with official statistics allow us to estimate to some extent informal remittance flows. As we stated before, official data do not reflect the true value of remittance flows, mainly because not all countries collect data from all the financial and non-financial institutions, while informal transactions remain barely recorded (Ghosh, 2006). Even some new forms of remittances have started to appear such as duplicates of credit cards that are very hard to track (or to distinguish them from tourist's or businessmen expenditures). The reliable accounting of unrecorded remittance flows has proved to be an almost impossible task. In practice, researchers resort to econometric techniques that attempt to circumvent the problem of unavailable data (Mahmud, 1989; Adams, 1991; ESCAP, 1986; Kazi, 1989; Tan and Canlas, 1989; Brown, 1995; Rodrigo and Jayatissa, 1989; Brown, 1992; Tingsabadh, 1989; Freund and Spatafora, 2005).

On our part, we collected bilateral remittance data from 16 EU origins to 33 different destinations, resulting in a dataset of 89 pairs of countries and a total of 337 observations. Table A1 in Appendix A shows remittances from the European sending

countries, the receiving countries and the observed periods. The average remittance recipient country in the sample receives about € 84 million per destination country and year. Moreover, the dispersion between countries is very large: from less than €100,000 to 1.6 billion per year in the France- Morocco corridor.

The remittance data were then matched with migration statistics from Eurostat and OECD (2002). Eurostat reports immigrant population and immigrants' flows by citizenship or country of birth, age group and sex. Nevertheless, the information from Eurostat is not enough to cover all pairs of countries and years. For those pairs of countries and years for which we still do not have information from Eurostat we used the *International Migration Dataset of the United Nations* (OECD, 2005). For those pairs of countries for which we have more than two observations we interpolate them to impute missing values of the relevant variables (and we check the resulting value using stock of immigrants data from any source). As we do not have data to construct the migrants' matrix by time since migration, we calculate the relation between flows and stocks of migrants as a proxy that would allow us to take into account changes in migrants' behavior or adaptation to the host country. The main descriptive statistics corresponding to immigrants are reported in Table A2.

We feel that it is necessary to further explain the data on immigrant's education level. As we explained before, the education level of an immigrant is a very important variable to determine his/her propensity to remit. However, international comparable data on immigrant's education level scarcely exists. In an effort to improve existent data and, more particularly focus on the international mobility of highly-qualified workers, OECD National Statistical Offices (NSOs) collected data from different OECD countries to measure and characterize foreign-born populations. The database developed "... covers 227 countries of origin and 29 receiving countries within the OECD area. The level of education was reported for more than 98 percent of the population 15 years of age or older. Finally, complete information (i.e. detailed education and detailed place of birth) is available for 97.8 percent of the OECD population aged 15+. 'Emigration rates' by level of qualification have been calculated for more than 100 countries".

Additional data sources used are the annual macro-economic database of the European Commission's (AMECO), the International financial statistics dataset of the IMF (GDP, inflation rates, and interest rates) and the International Labor Organization statistics (Labor statistics). Data on average wages in the host country was obtained from Eurostat and the European Community Household Panel (Table A3). Data on average wages of immigrants by region of origin is obtained from the European

Community Household Panel (ECHP). Eurostat published statistics on wages and salaries for the 27 European Countries data is available for 2004 for 27 EU countries and for 2000 for 14 EU countries (BG, CY, CZ, DE, DK, EE, ES, FI, FR, GR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK, UK). All the economic variables are expressed in 2001 constant prices.

Instead of using GDP per capita to obtain an estimation of disposable income for missing values of data, we decide to impute the average wage in the region. We believe that GDP per capita does not fully replicate the true average disposable income of immigrant's families in the home country and it also overestimates the true disposable income of employees in destination countries.

#### 4.2. Methodology and inputs needed for bilateral remittances estimation

##### *Average disposable income estimation*

We define the propensity to remit ( $\beta$ ) as the percentage of the disposable income sent to home by a representative immigrant.<sup>2</sup> A crucial element to obtain an accurate estimate of  $\beta$  is the construction of immigrants' wages in destination countries. As we do not observe immigrant wages for all pairs of countries and years, we estimate the relationship between wages perceived by immigrants relative to the average wage in the host country. We obtained an estimate of the following parameter (we called it  $\delta$ ) for the EU15 countries in 2000 and 2004 using data from Eurostat and the ECHP:

$$\delta_{r,c,t} = W_{r,c,t} / W_{c,t} \quad (9)$$

where  $\delta$  is the ratio between the wages ( $W_{r,c,t}$ ) of migrants from country of origin  $r$  in the host country  $c$  in period  $t$  to the wage of individuals in the host country  $c$  in period  $t$ .

To estimate  $\delta$  we face many problems. First, the scarcity of the information available makes difficult to obtain a good estimator for all EU countries. Therefore, instead of calculating  $\delta$  for all EU countries we calculate it only for those countries for which we have information (EU15) from Eurostat or ECHP. Second, if we calculate  $\delta$  for each country of origin the number of observations to perform the estimation is

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<sup>2</sup> See section 3 for more details.

very small. Therefore, we grouped the countries of origin in eight categories: EU27, other EU countries, Africa, North America, Central and South America, Near East, Other Asia countries, Australia-Oceania and others and we impute the average  $\delta$  to all the countries in the origin region. We are aware that we are losing country heterogeneity to increase the sample size but this is a necessary trade-off. However, we believe that the average immigrant's gross wage by region of origin is a good proxy of the immigrant's wages by country of origin (Table A3.b). Finally, the lack of data for wages in the agricultural sector is another caveat of the study, given the high proportion of migrants working in the agricultural sector. However, this information is not available yet. Since average wages in this sector are well below average wages for the whole the economy in all EU countries, we should interpret the figures corresponding to countries with a big proportion on immigrants in the agricultural sector as an upper threshold of the true remittances from those countries.

Table B1 in Appendix B shows the average  $\delta$  by country of destination. As we can see, on average, immigrant's gross wages are 62 percent of native's gross wages.

Once we have an estimate of  $\delta_{r,c,t}$  (at least by region of origin and country of destination, i.e., 4,574 pairs of country of origin – country of destination), we are able to recover the unobservable values for  $\delta_{r,c,t}$ . In order to do that, we regress the already known values of  $\delta_{r,c,t}$  (in 2000 and 2004) against characteristics ( $X$  and  $Z$ ) of the country and the migrant population (those characteristics known in all the cases, such as gender, age structure, and region of origin) in order to be able to predict the missing values. We make the regression:

$$\delta_{r,c,t} = \phi_c + \alpha' X_{r,c,t} + \varphi_1' Z_{c,t} + \varphi_2' Z_{r,t} + \varepsilon_{r,c,t} \quad (10)$$

where  $X_{r,c,t}$  are characteristics that vary both with the country of origin, destination and time  $Z_{c,t}$  are characteristics that vary with the destination country and time period and  $Z_{r,t}$  are characteristics that vary with the origin country and time period.

The results of the above equation are shown in table B2. The determinants included to predict  $\delta$ 's are globally significant at 1 percent level and 45 percent of the variation in the dependent variable is explained with such a parsimonious specification. Explanatory variables such as the percent of women in the stock of immigrants, immigrant's age structure, and region of origin are included in the regression. All of them are statistically significant and they have the expected signs. Other variables such as GDP in the destination country and interactions between age and gender are included but they did not alter the results significantly.

Better data on immigrant's characteristics, not available at the moment, is needed to guarantee the robustness of our results or to improve the precision of estimates obtained. However, we believe this is a first step to get a better knowledge of immigrant's behaviour. Furthermore, the results obtained are in line with the studies found in the literature. For example, both Green and Worswick (2004) and Aydemir and Skuterud (2005) find that immigrants who arrived in Canada in the 1990s earned around 30 percent less than Canadian-born workers. Economic research concerning immigrants' economic behavior was initiated by Chiswick (1978).

After obtaining the corresponding vector of parameters, we use them to predict the unobservable values. We limit the predicted  $\delta$  to be less than two standard deviations from the average  $\delta$ . We proceed in this way with the aim that our results are not affected by outliers generated from this procedure

Then, we obtain an estimate of the disposable income from the following equation:

$$y_{r,c,t} = \delta_{r,c,t} W_{c,t}(1-\tau_c) \quad (11)$$

where,  $\tau_c$  is the average income tax in the host country  $c$ .<sup>3</sup> In the base case we assume it is fixed at 15 percent. We believe this is a good approximation to the effective average income tax paid by immigrants. On the one hand, immigrant's wages are, on average, 38 percent lower than native's wages; therefore their effective income tax, given the progressive nature of European tax system, must be lower too. We can take into account this issue using the minimum tax rate paid in each country (as we do in a second scenario). Moreover, there are fiscal benefits and allowances and other non-pecuniary transfers to low income individuals that compensate, almost partially, the amount paid by them as income tax. As we do not observe all these benefits and allowances, we believe that assuming a 15 percent income tax rate can constitute a good approximation.

In a second scenario we add variation on the tax rate by country using the information obtained by the "Survey of the taxes in force in the Member States of the European Union". We use the minimum marginal tax rate obtained for each country of destination of the immigrants within the EU27. We understand that by using these minimum marginal tax rates by country we are underestimating the true disposable

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<sup>3</sup> Although we can include time variation in the tax rate, we assume this coefficient is constant over time because the span is small and tax rates have remained constant in most of the countries during the period.

income of immigrants, although the results presented are intended to show the sensitivity to this parameter.

A third disposable income scenario was constructed assuming that 20 percent of total immigrants are illegal and do not paid income taxes. The remaining 80 percent pay the minimum marginal tax rate. Taxes applied and estimates of disposable income are shown in Tables B3 and B4.

At the end, we have some problems for using disposable income which is underestimated (the non-presence of agricultural workers) and some problems for using disposable income which can be overestimated (the unobserved nature of individual tax rates). In any case, the three scenarios can help in understanding the importance both of the hypotheses used as well as the need for better data.

*Estimation of the propensity to remit*

At this stage, we can come out with an initial estimate of the propensity to remit for all the pairs for which we have data from our estimate of disposable income and the total registered remittances:

$$\beta_{r,c,t} = R_{r,c,t} / (y_{r,c,t} a_{r,c,t}) \quad (12)$$

where  $R_{r,c,t}$  are reported remittances sent per migrant originating in country  $r$  and located in country  $c$  and  $y_{r,c,t}$  is the disposable income of migrants originating in country  $r$  and located in country  $c$ . To obtain  $R_{r,c,t}$  we divide the total reported remittances by the total number of immigrants. Calculating  $R_{r,c,t}$  underestimates the true value of the propensity to remit because only active immigrants remit. For our purposes would be better to calculate the propensity to remit by active immigrant. But, the lack of data on active immigrants by pairs of countries (destination-origin) make impossible to calculate it.

Using the disposable income estimated in the section below and the observable remittance flows, we obtain  $\beta$  for 79 pairs of origin destination countries.<sup>4</sup> For many countries we have data for different years, summing up 333 observations. The average obtained  $\beta$  for these pairs of countries is 0.106 and the standard deviation

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<sup>4</sup> (BE-CO, BE-EC, BE-IL, BE-MA, BE-PE, BE-TN, CY-EG, CY-GE, CY-LB, CY-LY, CY-MD, CY-SR, CY-SY, CY-UA, DE-LB, DE-MA, DE-TN, DE-UA, ES-AR, ES-BG, ES-BO, ES-BR, ES-CO, ES-DO, ES-EC, ES-MA, ES-PE, ES-RO, ES-US, FR-DZ, FR-MA, FR-TN, GR-EG, GR-IL, GR-JO, GR-LB, GR-UA, HU-IL, HU-UA, IE-BR, IE-BY, IE-MD, IE-UA, IT-AL, IT-AR, IT-BR, IT-CO, IT-EC, IT-EG, IT-MA, IT-PE, IT-UA, IT-VE, LT-BY, LT-MD, LT-UA, LV-AM, LV-BY, LV-IL, LV-MD, LV-UA, NL-MA, NL-SR, PL-BY, PL-SY, PT-BR, PT-GE, PT-MA, PT-MD, PT-UA, PT-VE, SI-AR, SI-BR, SI-UA, UK-BD, UK-CN, UK-GH, UK-NG, UK-PK)

0.15. However, the distribution of  $\beta$  is not normal: 25 percent of the immigrants remit less than 1.71 percent of their disposable income, 50 percent remit less than 4.44 percent and 75 percent remit less than 14 percent.

In order to come out with an estimate of  $\beta$  for all the relevant triples, year ( $t$ ), country of origin ( $c$ ) and country of destination ( $r$ ), we assume that  $\beta$  is related to the previous parameters and some characteristics of the population ( $Y$ ):

$$\beta_{r,c,t} = \eta_c + \pi_1 \delta_{r,c,t} + \pi_2 Z_{c,t} + \pi_3 Z_{r,t} + \theta Y_{r,c,t} + \xi_{r,c,t} \quad (13)$$

The meaning of every variable in (13) has been explained above, except  $\eta_c$ , which capture unobserved country specific factors affecting the propensity to remit (i.e, cultural effects, for instance).

We estimate the propensity to remit using the methodology of panel data, taking into account that our dataset is unbalanced. In doing so, we are including unobserved factors affecting the propensity to remit which are different across EU countries. Table B.3 in the Appendix presents the estimation results. We run several alternative specifications in order to check the robustness of our results as explained below.

The variables included in the specification used to estimate  $\beta$  are the age, gender, education and region of origin and destination of the immigrant. Age is defined in four categories: percent of individuals aged less than 29 years old, percent of individuals between 20 and 35 years old, percent individuals aged between 35-59 years old and percent of individuals aged more than 59. Gender is defined as the percentage of women in the immigrant population. The region of origin was included using a dummy variable for each of the origin region. Each variable takes value one if the individual belongs to that region and zero otherwise. The education level is defined in two categories: percent of individuals that report high level of education and percent of individuals that do not report it. The average household size of the immigrants could not be taken into account because of the lack of data for a great majority of pairs origin-destination country.

From our theoretical model we know that remittances depend positively on immigrant income in the destination country and negatively on family's income in the origin country. Instead of using wage differentials, we use GDP per capita in the host and home country to control for income differences between origin and destination. However, we have considered various specifications for this variable. In the first specification we include a variable (EU15) that takes value one if the individual's

destination country was one of the EU15 countries and the log of the GDP per capita in the home country. We do not include the GDP per capita in the destination country because the correlation between these two explanatory variables is very high (more than 70%) and it generates important problems of collinearity. In the second specification we have included the ratio between the log of the GDP per capita in the destination country and the log of the GDP in the home country.

An important determinant of remittances should be the seniority of immigrants in the destination country. Since we do not observe this variable in a majority of cases we follow an IV approach and proxy it by either including the difference between the stocks of immigrants between two consecutive periods; or alternatively, the ratio between the flow and stock of immigrants. In our empirical specification we have chosen the second because we feel the relative measure is more suitable, in econometric terms, in the model we are adjusting.

Education is one of the most important determinants of the propensity to remit. In our model we include the percentage of immigrants in each country of destination that reports a high level of education. Immigrants that finished academic tertiary, vocational tertiary or advanced research are included in this category. We found that the partial effect of skilled migration is significant and positive.<sup>5</sup> This means that skilled migration may be positively associated with a larger flow of remittances. This result is in line with the results obtained by other studies (Gubert , 2002; Amuedo-Dorantes and Pozo , 2006; Holst and Schrooten,2006) and provides evidence for the loan repayment motive. However, different effects may affect the relation between education and the propensity to remit. On the one hand, the loan repayment motive is an explanation about the positive relation between education and the propensity to remit. Moreover, education is a proxy for income which is subject to measurement error, so as education can capture the effects of unmeasured income. On the other hand, skilled workers are likely to come from relatively wealthy families and, hence their propensity to remit may be lower. At the end the positive effects dominate in our results. To allow for a non-linear shape of education on the propensity to remit we also include interactions between the education level and the sex of the immigrants. We found that females remit more than males but high educated females remit less.

Finally we account for the source of data of the remittances. The variable "survey" takes value one if the remittance data come from survey data and zero otherwise. We do not have survey data for all the pair's origin-destination countries but we have it for some remittance destinations in Spain, UK, Italy and France. We

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<sup>5</sup> To obtain it we calculate the partial derivative of the propensity to remit respect to education.

understand that this variable could be a proxy to account for informal remittance flows, although we are aware it can capture effects of other unobservable variables. We have proceeded in this way due to the scarcity of remittance data.

The main descriptive statistics of the variables included in the regression are presented in Table B.3.a. The results we get are in line with previous estimations and with the theoretical model. As we expected the GDP differential between the sending and the home country has a significant positive impact on the average propensity to remit. On average, people remit more the poorer the receiving country is, relative to the sending country. Also, being female, aged 30 to 35 years old and coming from a country not included in the EU increased, in average, the propensity to remit. The results are robust to different specifications of the model.

Specially interesting are the results for the "survey" dummy, which takes the value one if the propensity to remit, for a given pair country of origin-destination, comes from a survey. The estimated parameter is positive and significant. We believe that this parameter may be a proxy of the difference between recorded remittance flows in official statistics and the true value of remittance flows. The survey data variable shows positive and significant effects in all the specifications of the model. However, its value is very sensitive to changes in the specification of the model. For only 25 pairs of countries of 333 pairs for which we have data on remittances, survey information is available (8.1 percent). The relative variation of  $\beta$  can be obtained from the log model:

$$\% \Delta \beta_{r,ct} \approx (100\kappa) \quad (14)$$

where  $\kappa$  is the estimated parameter of the survey variable. Therefore, from results in Table B.2 in appendix we can obtain that using survey data increase in 91 percent the results obtained using official data. After having estimated the parameters characterizing the above relationship, we predict the values of beta for the missing years and pairs of origin-destination countries. In order to keep the coherence of our predictions we have established limits for them. The predicted beta cannot be greater than two standard deviations apart from the average by country of destination. The estimated  $\beta$  by host countries and years is shown in Table B.3.c (see Appendix B).

## 5. Results

### 5.1. Overall remittance estimation

Once we have an estimate of  $\beta$  for all the relevant pairs of origin-destination countries we recover remittance flows in the following way:

$$r_{r,c,t} = \beta_{r,c,t} y_{r,c,t} AM_{r,c,t} \quad (15)$$

$$R_{c,t} = \sum_c r_{r,c,t} \quad (16)$$

where  $r_{r,c,t}$  are the expected remittances sent per migrant originating in country  $r$  and located in country  $c$ , at time  $t$ ;  $\beta_{r,c,t}$  is the propensity to remit of migrants from originating country  $r$  and located in country  $c$ , at time  $t$ ,  $y_{r,c,t}$  is the disposable income of migrants originating country  $r$  and located in country  $c$ ,  $AM_{r,c,t}$  the number of migrants originating country  $r$  and located in country  $c$ ,<sup>6</sup> and, finally,  $R_{c,t}$  are total remittance flows from the EU countries to country  $r$ .

#### *Global amount of annual remittances*

In this section, we describe and analyze the total amount of remittance transfers from EU27 to third countries and the redistribution inside EU27. Our findings complement the data that already exists from different sources. However, in order to have a complete figure of the ways of remittances from the EU, we have faced a very important problem concerning data availability. We believe that practically every single number obtained from the analysis can be improved in case better data (especially survey data) becomes available. Under these circumstances, all the results we get should be taken and interpreted with caution.

Since a precise estimation of total remittances is very difficult because of the lack of data, we present estimates under different scenarios defined by changes in the most important assumptions of our model (propensity to remit and disposable income). The main assumptions made and their corresponding results for the most plausible scenarios are reported in Tables 2.a and 2.b, respectively. We make some sensitivity analysis in sub-section 5.2.

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<sup>6</sup> Remember that we calculate the propensity to remit by migrant, therefore to recover total remittances we have to multiply by the total number of immigrants.

In our intermediate scenario, we assume that the average propensity to remit is 0.109 and the median is 0.06. Following Freund and Spatafora (2005), we assume that remittances sent through informal channels may increase average total remittance flows by 50 percent. Therefore we re-calculated beta multiplying it by 1.5 for those pairs of origin - destination countries for which we have only official data. Under this assumption and assuming an income tax rate of 15 percent, total remittance flows from EU to Non-EU countries amount 19.1 billion, and redistribution inside EU27 amounts 6.3 billion. Thus, we estimate remittances of 25.4 billion. We believe this is a good approximation to the true value of remittance flows. However, better data is needed to improve the knowledge about remittance flows and the robustness of the estimations. In order to assess the validity of the estimation we compare the results obtained with the WB estimations (Migration and Remittances Factbook) and the 2nd EU information on remittances for 2000 and 2004, in subsection 5.3.

**Table 2.a: Assumptions**

Assumptions	
Times remitting per year	12
Average Tax Rate	15%-20%
Disposable Income per migrant by country (€) (Weighted Average by immigrants) <sup>1</sup>	1,189-1,254
Average Beta ( <i>Estimated</i> )	0.08-0.10-0.12
Median Beta ( <i>Estimated</i> )	0.04-0.06-0.08
Minimum Beta ( <i>Estimated</i> )	0
Maximum Beta ( <i>Estimated</i> )	0.39

Notes.

1. A complete figure of disposable income estimation is shown in Table B.2.c for the base case

The main results found, suggest that total remittance flows have been continuously increasing during the last five years according with the evolution of immigrants flows. In our most realistic scenario total remittance flows outside EU27 represents almost 16 percent of worldwide worker's remittances for that year, estimated by the WB at 160 billions of USD (129 billions of Euros of 2004).

**Table 2.b: Results in billion of € at constant prices of 2001**

Intermediate scenario	Tax=15%
Total Remittance Flows from EU27 to countries worldwide Non EU27 (Billion of €)	<b>18.7</b>
Total Remittance Flows inside EU27 (Billion of €)	<b>6.5</b>
<b>Total Remittance Flows (Billion of €)</b>	<b>25.2</b>

Notes.

Low scenario assumptions: all immigrants remit 8.3 percent of their income once per month. They have average disposable income of 1,254 €.

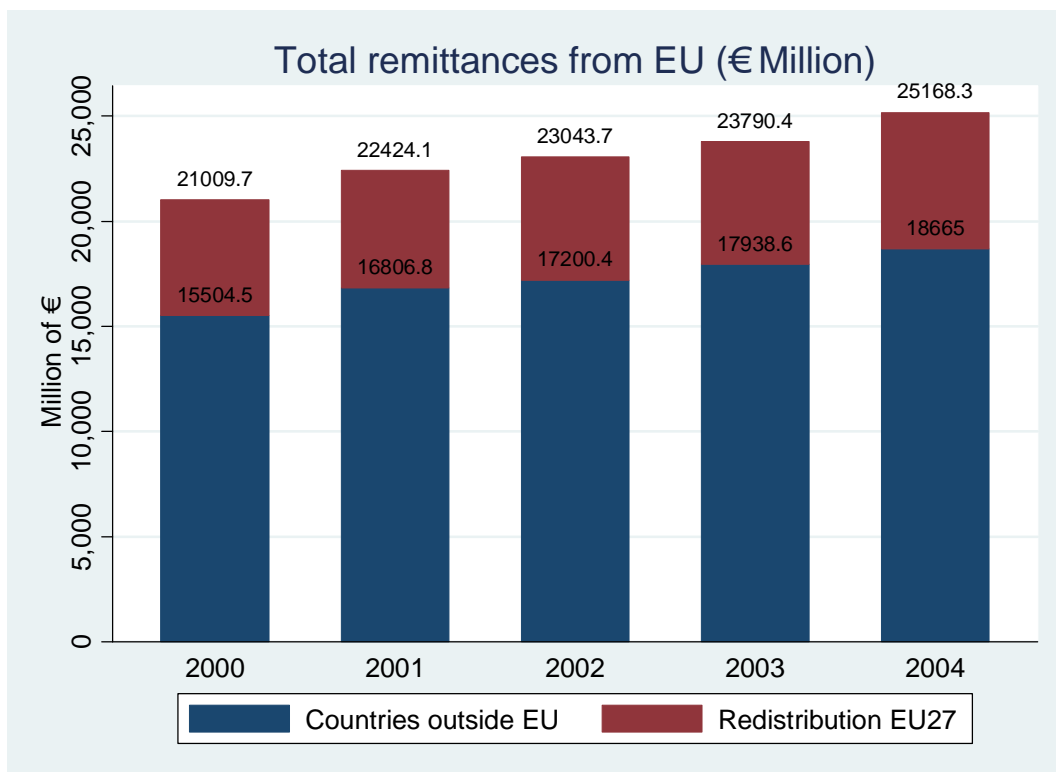
Mid scenario assumptions: 100 percent of immigrants remit 11.3 percent of their income once per month. They have average disposable income of 1,254 €.

High scenario assumptions: 100 percent of immigrants remit 13 percent of their income once per month. They have average disposable income of 1,254 €.

As can be seen in the figure below, remittance flows to non-EU countries increase almost 25 percent during the period 2000-2004 from 15.5 billion estimated in

2000 to 18.7 billion in 2004. This huge increase is explained by the evolution of immigrant’s flows from countries worldwide to EU27 and from new EU members to EU15. Spain and Italy are the countries with greater remittance growth during the period, in absolute (2,345 and 887 respectively) and in relative terms (200 and 150 percent respectively).

**Figure 1: Remittances evolution (2000-2004)**



**5.2. Sensitivity analysis**

Sensitivity analyses are used to assess how robust the results are to the assumptions made on the data, the parameters and the methods that were used in the estimation. In this case, we evaluate the sensitivity of the most important parameters of the model and we see how they affect total remittance flows. As it is expected, the results are very sensitive to changes in the propensity to remit, and to changes in the number of immigrants. In our model, all of them have a linear relationship with the total remittance flows; therefore the changes in remittances should be proportional to changes in each one of them.

To perform the sensitivity analysis we estimate a base scenario in which we assume that immigrants transfer money once per month and pay a fix income tax rate

of 15 percent in all the destination countries. Under these assumptions, and using the estimates obtained for  $\beta$ , total remittance flows from EU to non-EU countries amount, in 2004, 13.3 billion, and redistribution inside EU27 amount 4.3 billion. Thus, we estimate a total flow of remittances of 17.6 billion. However, we believe this scenario underestimates the true value of remittance flows because it does not take into account informal flows for those countries for which we have only official data. We define this scenario as the lowest one.

As we say in the previous sub-section our intermediate scenario assumes an increase of 50 percent in the average propensity to remit due to “*informal remittances*” according to average figures in the literature. The results are shown in Tables 2.b, 3.a and 3.b.

We made a third assumption about beta using the coefficient of the variable that account for survey data. We think survey data helps in identifying alternative channels used by immigrants to send remittances as well as some factors affecting its use, because there are no reasons to lie or misreport in this kind of data. Using the partial effect obtained for the variable survey in the propensity to remit estimation we recalculate total remittances increasing  $\beta$  by 92 percent (We obtained this value from the regression explained in section 4.2) in the interval between percentile 20 and 90. We employ this trimming to avoid outliers arising from the estimates. Using this assumption, total remittances and remittances to non-EU countries amounted, in 2004, to 29.9 Billion and 21.9 Billion of Euros, respectively.

Finally, we add variation to the average tax rate paid by the immigrants in the destination country. Instead of using the minimum income tax rate of 15 percent paid in Spain we used the minimum income tax rate paid in each country (Table A4). On average, the income tax rate used was 20 percent, 5 percent greater than the income tax used in the base case. From this scenario and using our most plausible distribution of Beta we obtain an estimate of remittance flows to non EU27 of about €13.4 billion in 2004, €5 billion lower than the estimates obtained from the intermediate scenario. We take into account that not all the immigrants pay income taxes. We assume that only 80% of the immigrants in each country pay the minimum marginal income tax rate. From this scenario total remittance flows to Non-EU27 countries go down to €17.6 billion in 2004 comparing with the most plausible scenario. Tables 3.a and 3.b sum up the results of the sensitivity analysis. At the end, we only do not take into account that some proportion of the immigrant are remitting while another proportion are not. We do not have information by country (of origin and destination) and year to assume credible proportions. We believe, however, that this determinant can have

effects of reducing the total remittance flow and that the three scenarios present a picture of the whole situation.

**Table 3.a: Total Remittances (billion € at constant 2001 prices)**

<i>Taxes / Beta</i>	<i>Estimated Beta</i>	<i>Beta adjusted by World Bank Informal remittance estimation</i>	<i>Beta adjusted by estimate difference between survey and official data</i>
	16.7	23.7	28.5
<i>Marginal Tax</i>			
<i>Effective Tax</i>	17.6	24.9	29.9
<i>Min Tax</i>	17.7	25.2	30.2

**Table 3.b: Remittances to Non EU27 countries (billion € at constant 2001 prices)**

<i>Taxes / Beta</i>	<i>Estimated Beta</i>	<i>Beta adjusted by World Bank Informal remittance estimation</i>	<i>Beta adjusted by estimate difference between survey and official data</i>
	12.6	17.6	20.8
<i>Marginal Tax</i>			
<i>Effective Tax</i>	13.3	18.5	21.9
<i>Min Tax</i>	13.4	18.7	22.1

### 5.3. Comparison with the 2<sup>nd</sup> EU Survey on remittances and World Bank estimates.

#### 2<sup>nd</sup> EU Survey on remittances

In this section we compare our estimations with the amounts reported by EU Survey for 2004 (see Table 4). Data should be taken with caution because the 2<sup>nd</sup> EU Survey on remittances is only a collection of official data available in Member States rather than a survey in a proper sense and therefore they are not necessarily comparable. Distortions in the information reported by Central Banks, heterogeneous concepts and methods of collection and estimation, and certain difficulties to capture informal remittance flows may explain the differences. We compare results country by country because not all EU countries answered the EU survey. From the numbers reported in Table 4 it seems absolutely clear that the 2<sup>nd</sup> EU survey underestimates total remittances by an important amount (4.6 billion euros or 53 percent of our base

case scenario) even in the most conservative scenario for all EU15 countries. In the alternative, intermediate or most realistic scenario, the difference is much large.

**Table 4: Worker's remittances in 2004 by region of origin: EU Survey vs. estimation.**

<i>Country</i>	<i>MM of €</i>				<i>% of GDP</i>			
	<i>2004 2nd EU Survey</i>	<i>Low scenario</i>	<i>Most Plausible scenario</i>	<i>High scenario</i>	<i>2004 2nd EU Survey</i>	<i>Low scenario</i>	<i>Intermed. scenario</i>	<i>High scenario</i>
Spain	3,258.30	3,075.70	4,034.70	4,524.60	0.39	0.37	0.48	0.54
Germany	2,038.00	3,860.90	5,740.40	7,017.10	0.09	0.17	0.26	0.32
France	1,398.00	3,327.10	4,963.10	6,194.50	0.08	0.20	0.30	0.37
Italy	782.70	1,471.50	1,943.30	2,305.90	0.06	0.11	0.14	0.17
Netherlands	452.50	566.80	836.80	1,000.10	0.09	0.12	0.17	0.20
Portugal	405.20	297.20	361.80	411.20	0.28	0.21	0.25	0.29
Greece	240.90	100.50	150.80	189.90	0.14	0.06	0.09	0.11
Belgium	226.90	632.40	933.20	1,115.70	0.08	0.22	0.32	0.39
Ireland	90.20	210.80	313.90	389.50	0.06	0.14	0.21	0.26
Slovenia	56.40	14.30	21.50	23.60	0.22	0.05	0.08	0.09
Cyprus	30.10	31.30	46.60	55.20	0.24	0.25	0.37	0.43
Hungary	5.50	6.20	9.20	8.60	0.01	0.01	0.01	0.01
Lithuania	1.20	1.50	2.20	2.60	0.01	0.01	0.01	0.01
Poland	2.80	9.70	13.30	10.70	0.01	0.00	0.01	0.01
<b>Total</b>	<b>8,988.70</b>	<b>13,605.90</b>	<b>19,370.80</b>	<b>23,249.20</b>	<b>0.12</b>	<b>0.18</b>	<b>0.25</b>	<b>0.30</b>

Notes.

1. Gross domestic product expressed at constant market prices of 2001. Source: AMECO.

*World Bank Migration and Remittances Fact book*

The Migration and Remittances Fact book “provides a snapshot of migration and remittances for all countries, regions and income groups of the world, compiled from available data from various sources”.<sup>7</sup> Table 5 shows the differences found between our estimates and WB estimates. In the intermediate scenario our estimate of the total amount of remittances differs only 5 percent with respect to WB figures. However, huge differences are observed for Spain, Germany and France both in the number of immigrants and in the average of remittance by immigrant. The global amount or remittances flows from these two countries estimated by us and provided by the WB are similar. Since we are using the same data sources for all EU countries, we do not believe that the proportion of working population of migrants contributes to explain the differences. At the end, we only have the explanation for France and Germany that we underestimate the effect that the seniority proxy has on the propensity to remit.

**Table 5: Worker’s remittances in 2004: World Bank vs. estimation**

<i>Country</i>	<i>WB Work. Remm.<sup>1</sup></i>	<i>Low Scenario</i>	<i>Diff (World Bank)</i>	<i>Intermed. scenario</i>	<i>Diff (World Bank)</i>	<i>High scenario</i>	<i>Diff (World Bank)</i>
Spain	6,065	3,076	2,989	4,035	2,030	4,525	1,540
Germany	4,250	3,861	389	5,740	-1,490	7,017	-2,767
France	3,701	3,327	374	4,963	-1,262	6,195	-2,494
Italy	3,042	1,472	1,571	1,943	1,099	2,306	736
Austria	1,050	504	546	749	301	923	127
Ireland	856	211	645	314	542	390	467
Netherlands	751	567	184	837	-86	1,000	-249
Portugal	704	297	407	362	342	411	293
Poland	511	10	501	13	498	11	500
Belgium	485	632	-147	933	-448	1,116	-631
Greece	306	101	206	151	155	190	116
Luxembourg	76	107	-31	160	-84	193	-117
Cyprus	63	31	32	47	16	55	8
Sweden	30	329	-299	483	-453	568	-538
Bulgaria	26	0	26	1	26	1	25
Hungary	20	6	14	9	11	9	11
Latvia	5	2	3	2	3	3	2
Malta	3	2	1	4	-1	5	-2
Lithuania	2	2	1	2	0	3	-1
Estonia	1	1	0	1	0	1	0
Romania	1	3	-2	4	-3	3	-2
Slovenia	1	14	-13	22	-21	24	-23
<b>Total (%)</b>	<b>21,949</b>	<b>14,552</b>	<b>7,397 (33.7)</b>	<b>20,774</b>	<b>1,175 (5.35)</b>	<b>24,945</b>	<b>-2,996</b>

Notes. MM of Euros of 2001. Average Exchange rate: 1.2439. IPCA (Euro-Zone 2000).

<sup>7</sup> We take this information from the web page of the World Bank.

#### 5.4. Global amount of annual remittances by origin and destination countries

##### *Global amount of annual remittances by origin countries*

The estimates of total remittances significantly vary by countries of origin and destination. Remittance flows were made up by countries amounts that rank from less than €200 thousand (Estonia and Bulgaria) to more than 3.0 billion (Spain, Germany, France, Italy and UK). However, more than 80 percent of total remittances flows from EU27 were registered in Germany, Spain, UK, Italy and France. Comparing 2000 and 2004, Spain has a significant increase in total EU27 remittances outflows, from 6 percent in 2000 to almost 17 percent in 2004. On the contrary, France reduces its participation from 26 percent in 2000 to 18 percent in 2004.

Table 6 present the volume of remittances by country of origin. We can observe four countries where the growth rate of remittances from 2000 to 2004 is very big: Spain, Poland, Italy and Portugal. The explanation for the figures in Spain, Italy and Portugal, beside the trends in the immigrant arrivals, could be the introduction of flexibilities in their respective immigration laws. The years where these flexibilities were introduced took place in Italy in 1998, in Spain in 2000 and in Portugal in 2001. Moreover, Italy in 2002 and Spain in 2004 did regularization of illegal immigrants that have then accessed to all channels for sending remittances to their countries of origin. Even in the case that the amount of remittances per capita remains constant through this period (because the propensity to remit remains constant), the amount of legal immigrants experienced important increases. We do not have any explanation for the case of Poland. Belgium, France and Germany experienced decreases in the total volume of remittances related to the decrease in the propensity to remit mainly driven by the seniority of the population of immigrants in these countries. The volatility of the number of immigrants in Slovenia, Latvia and the Slovak Republic explain the differences between years in these countries. Figures 2.a and 2.b present a geographical breakdown by sending countries.

Figure 2a: Remittance by sending countries-2000-2004

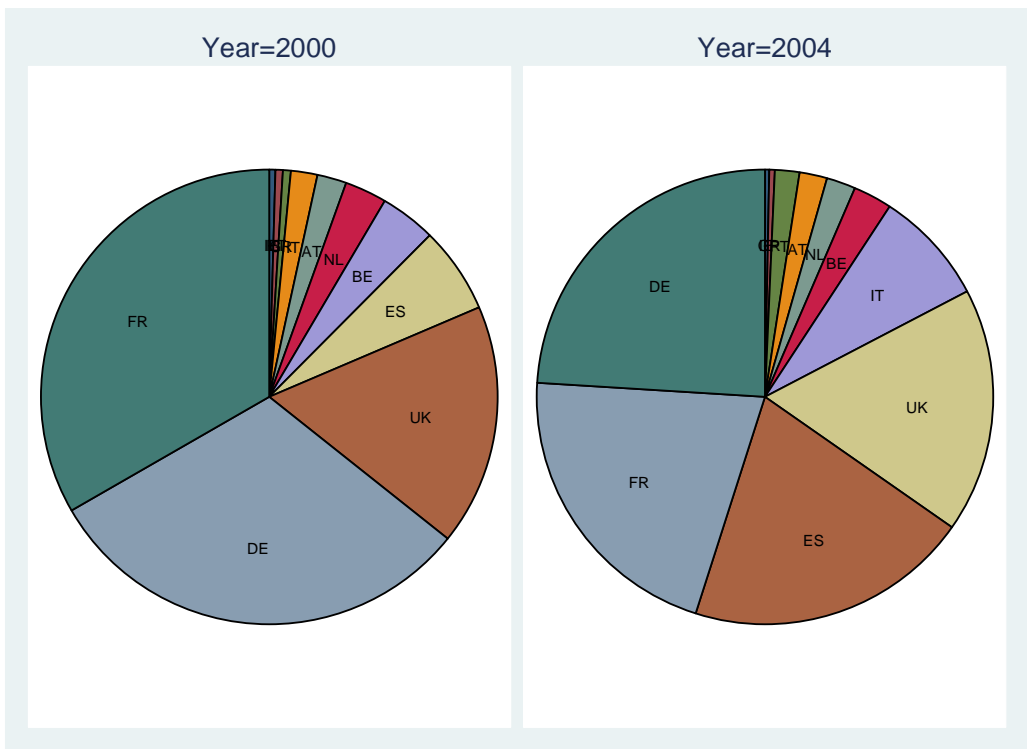
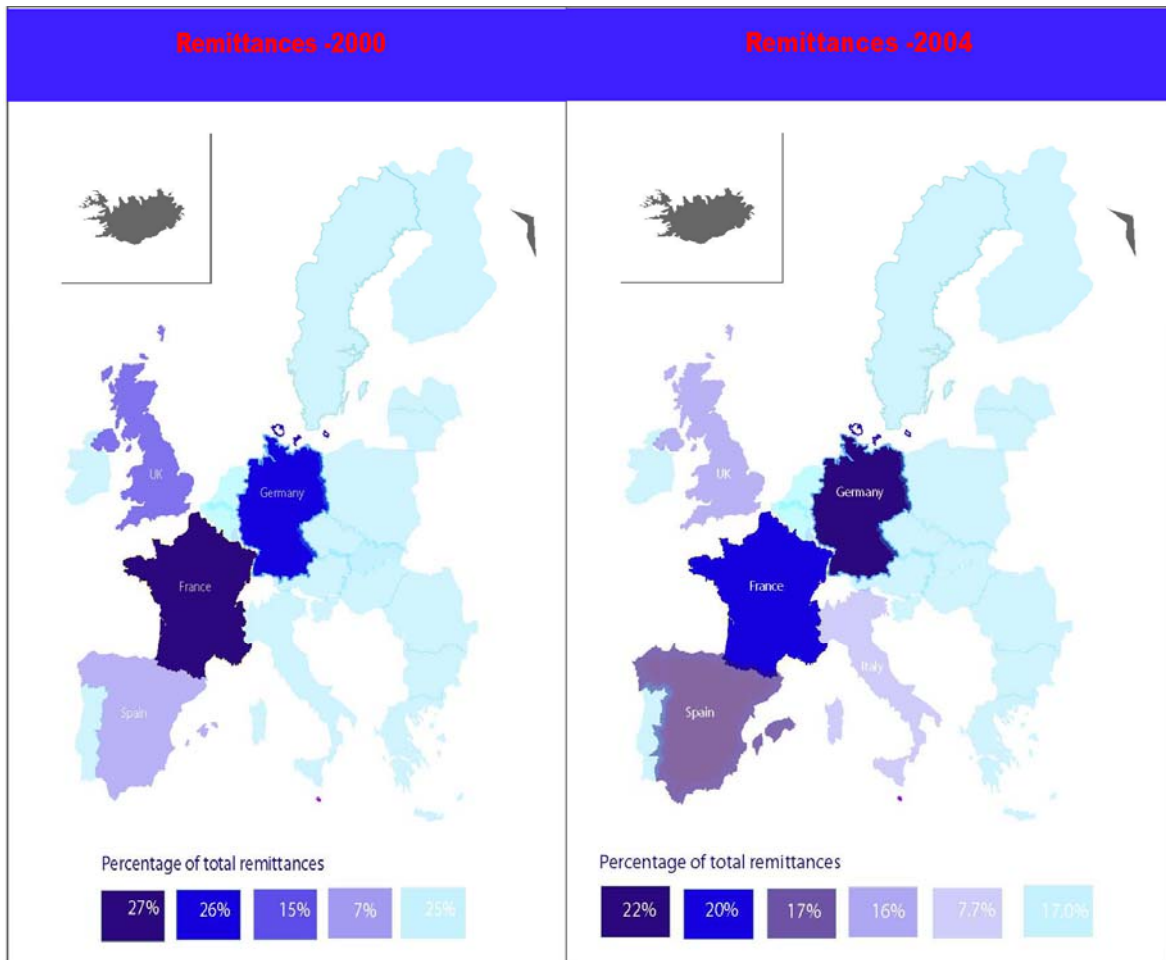


Figure 2b: Remittance by sending countries-2000-2004



**Table 6: Remittance flows by country of origin  
(intermediate scenario)**

Country	Remittance inside EU27 Countries - MM of € - 2000	Remittance to Non EU27 countries MM of € - 2000	Remittance inside EU27 - MM of € - 2004	Remittance to Non EU27 countries MM of € - 2004
Austria	238.64	418.75	311.96	437.05
Belgium	345.18	680.15	372.34	560.82
Bulgaria	0.12	0.4	0.12	0.4
Cyprus	16.65	26.27	15.95	30.66
Czech Republic	7.44	12.86	17.18	23.85
Germany	1351.36	4254.95	1621.72	4118.72
Denmark	59.94	309.05	63.62	306.36
Estonia	0.16	0.54	0.2	0.65
Spain	352.75	1035.99	653.54	3381.17
Finland	15.74	22.82	17.31	26.49
France	1561.86	4143.32	1520.77	3442.33
Greece	30.83	127.41	29.01	121.78
Hungary	3.88	2.78	5.66	3.55
Ireland	116.7	202.34	111.88	202.02
Italy	137.96	739.09	316.89	1626.39
Lithuania	0.03	0.57	0.03	2.21
Luxembourg	162.87	0	159.82	0
Latvia	0.14	2.87	0.26	2.16
Malta	1	2.01	1.35	2.31
Netherlands	205.13	543.39	243.03	593.79
Poland	1.27	4.75	3.08	10.17
Portugal	15.77	162.26	17.06	344.76
Romania	0.17	2.75	0.22	3.52
Sweden	103.26	335.26	119.86	363.28
Slovenia	0.99	22.37	0.97	20.49
Slovak Republic	1.68	1.33	1.71	0.95
United Kingdom	773.77	2450.2	897.78	3039.14
<b>Total</b>	<b>5505.29</b>	<b>15504.48</b>	<b>6503.32</b>	<b>18665.02</b>

In Table 7, we report the shares of remittances flows on GDP for the 27 countries as well as for the aggregates EU15 and EU27. On average, EU15 countries remitted in 2004 0.25 percent of their GDP. Luxembourg reported the highest amount in all the scenarios (0.49 percent), followed by Spain (0.47 percent), Cyprus (0.44 percent). Except for the Scandinavian countries where the number of immigrants is small, Cyprus and Slovenia, EU15 countries are the leaders in outflows.

**Table 7: Remittance flows as percent of GDP<sup>1</sup> in origin countries**

<i>Remittance Flows year</i>	<i>Total Remittance: (2000)</i>	<i>Total Remittance: (2004)</i>	<i>Remittance to Non-EU27 (2000)</i>	<i>Remittance to Non-EU27 (2004)</i>
Luxembourg	0.62	0.49	0.00	0.00
Cyprus	0.22	0.47	0.18	0.40
Belgium	0.51	0.44	0.32	0.30
France	0.15	0.35	0.14	0.34
Austria	0.22	0.30	0.18	0.26
Ireland	0.34	0.25	0.29	0.21
Germany	0.24	0.24	0.16	0.16
Spain	0.11	0.23	0.10	0.20
Denmark	0.25	0.22	0.17	0.15
United Kingdom	0.24	0.21	0.18	0.15
Netherlands	0.18	0.15	0.14	0.11
Sweden	0.21	0.15	0.18	0.13
Portugal	0.21	0.15	0.20	0.14
Greece	0.14	0.14	0.11	0.11
Slovenia	0.20	0.13	0.13	0.08
Italy	0.14	0.12	0.11	0.10
Malta	0.07	0.08	0.04	0.05
Latvia	0.05	0.04	0.04	0.03
Czech Republic	0.03	0.03	0.02	0.02
Finland	0.07	0.02	0.06	0.02
Slovak Republic	0.02	0.02	0.01	0.01
Hungary	0.01	0.02	0.01	0.02
Estonia	0.01	0.02	0.01	0.01
Romania	0.00	0.01	0.00	0.01
Lithuania	0.01	0.01	0.01	0.01
Bulgaria	0.02	0.01	0.01	0.00
Poland	0.01	0.00	0.00	0.00
<b>EU15</b>	<b>0.22</b>	<b>0.25</b>	<b>0.18</b>	<b>0.20</b>
<b>EU27</b>	<b>0.21</b>	<b>0.24</b>	<b>0.17</b>	<b>0.19</b>

Notes.

1. GDP is defined in market prices in constant € of 2001. Source: AMECO.

**Table 8: Remittance flows by country of origin and region of destination - 2004 (as % of total remittances)**

Country	EU15	Other EU countries	África	North America	Central and South America	Near East	Other Asia	Australia-Oceanita	Total
Austria	16.99	64.88	4.22	1.61	3.64	2.86	5.65	0.14	100
Belgium	31.19	20.77	35.94	3.27	3.83	0.27	4.63	0.10	100
Bulgaria	7.69	69.23	1.92	1.92	1.92	11.54	5.77	0.00	100
Cyprus	23.11	25.78	6.93	6.22	0.53	27.70	9.29	0.44	100
Czech Republic	4.47	76.73	2.72	4.34	1.19	3.18	7.19	0.18	100
Germany	10.08	61.55	7.43	3.32	4.57	4.78	8.16	0.12	100
Denmark	10.30	22.70	30.10	2.89	5.14	8.04	20.53	0.30	100
Estonia	20.00	75.00	0.00	2.50	0.00	1.25	1.25	0.00	100
Spain	6.31	11.65	27.54	1.02	52.00	0.54	0.90	0.04	100
Finland	18.68	25.05	20.79	5.20	0.00	29.21	1.08	0.00	100
France	25.74	5.51	59.61	0.32	3.48	1.61	3.69	0.03	100
Greece	4.75	82.02	0.00	10.32	0.00	1.12	0.66	1.12	100
Hungary	8.96	67.98	4.15	1.09	2.51	7.21	7.98	0.11	100
Ireland	31.62	18.03	19.38	12.80	3.48	7.29	4.62	2.77	100
Italy	4.09	42.80	30.67	2.00	8.74	8.28	3.36	0.06	100
Lithuania	0.89	95.98	0.45	0.89	0.00	0.89	0.89	0.00	100
Luxembourg	99.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	100
Latvia	7.05	85.06	0.41	1.66	0.83	3.73	1.24	0.00	100
Malta	39.58	0.00	0.00	45.83	0.00	0.00	0.00	14.58	100
Netherlands	19.87	24.47	31.23	4.22	8.03	3.47	7.93	0.79	100
Poland	20.44	61.78	3.75	2.66	0.68	2.59	8.04	0.07	100
Portugal	4.27	34.11	11.64	0.42	48.64	0.17	0.70	0.06	100
Romania	3.91	85.33	0.00	0.73	0.00	9.54	0.49	0.00	100
Sweden	15.39	29.20	19.03	4.23	9.09	9.61	12.71	0.73	100
Slovenia	3.24	94.74	0.34	0.44	0.59	0.44	0.15	0.05	100
Slovak Republic	8.76	76.10	3.59	3.19	1.20	4.78	2.39	0.00	100
United Kingdom	15.63	9.35	30.16	6.46	9.44	9.82	14.52	4.63	100

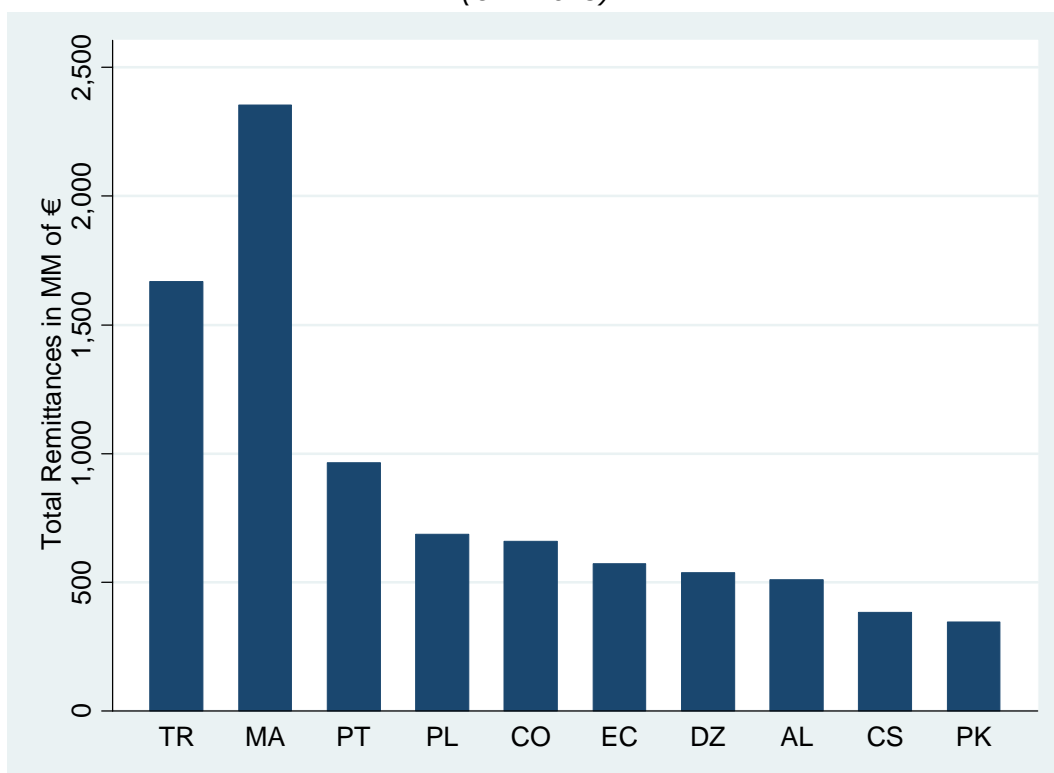
From Table 8 we can also confirm that geographical, cultural and linguistic proximities, as well as legal accessibility are very important determinants to choose the emigration country and, as a result, to the differences in the volume and destination of remittances from EU countries.

**Global amount of annual remittances by destination countries**

According to our estimations, in 2004, Africa and other European countries are the main beneficiaries of EU remittance flows (28.5 and 27.5 percent respectively), followed by Central and South America (15 percent). Most of remittances to other European countries were originated in Germany; remittances to Africa were originated in France, Spain and the UK and remittance to Central and South America were originated in Spain.

A breakdown using a finer classification of the destination countries shows that Morocco was the largest recipient of EU remittance flows. Its remittance inflows account, in 2004, to 11.5 percent of total remittance flows from EU. Morocco was followed by Turkey (8.1 percent) and Colombia (3.54 percent)). Top 10 remittance recipients countries are shown in next diagram.

**Figure 3: Top 10 Remittance-Receiving Countries, 2004**  
(€ Millions)



**Table 9: Top remittance receiving countries from EU27 - Worldwide.  
Remittance flows ( in € and % of GDP) – Intermediate scenario**

Country	Total Remittance 2004, Millions of € (constant prices of 2000)	Remittances as percentage of total remittances	GDP market prices 2004 constant prices of 2000 (Billion of €)	% Rem / GDP 2004
Somalia	236.93	1.27	1.31	18.09
Sao Tome and Principe	8.27	0.04	0.07	11.05
Guinea-Bissau	29.93	0.16	0.32	9.48
Albania	618.51	3.31	8.72	7.10
Cape Verde	69.83	0.37	1.08	6.45
Gambia	29.37	0.16	0.47	6.26
Eritrea	44.68	0.24	0.74	6.01
Morocco	2918.93	15.64	58.53	4.99
Sierra Leone	54.8	0.29	1.26	4.37
Moldova	106.33	0.57	3.04	3.50
Zimbabwe	173.9	0.93	5.50	3.16
Congo, Rep.	151.69	0.81	5.09	2.98
Ghana	290.45	1.56	10.38	2.80
Afghanistan	190.92	1.02	6.98	2.73

Notes.

1. GDP of origin countries are expressed in constant Euros of 2001.

The dependency of a country on remittances is often measured in terms of the GDP, exports or foreign direct investment. In our case, we used the ratio between total remittances and GDP. As we can see in Table 9 the highest dependence on remittances, measured in percent of GDP, was reached in Somalia, where remittances amounted for almost 19 per cent of GDP. But also a share as reported in Albania, Morocco, Zimbabwe, Guinea, Afghanistan, Ghana and Senegal can be considered as high in an international comparison.

The positive evolution of the volume of remittances has compensated, to some extent, the negative trend in the amount of direct investment of EU countries outside EU. On average in the intermediate scenario, remittances to non-EU countries represent 10 percent of foreign direct investment and while foreign direct investment decreases by 3 percent during the period of analysis, remittances flows increases by more than 24 percent. The conclusions obtained from the results about remittance flows from EU15 to third countries in terms of GDP are the same as the previous ones.

## 5.5. Remittances by origin and recipient countries: Main corridors

### *EU27- rest of the world*

To obtain a detailed picture of bilateral remittances corridors can be important for assessing priorities and implementing policy measures. We present in this subsection the main corridors identified according to our estimates. Tables 10 to 19 sum up the main pairs of origin destination countries in the intermediate scenario for 2004. The geographical breakdown of remittances reflects strongly the main origins of the immigrants in destination countries. In fact, we believe that there is a relationship between the main remittance corridors and the “psychological” and physical proximity between the sending and the receiving country. We understand as “physiological” distance, the existence of links due to ancient colonies or strong relations between the pair of countries. The data confirm this hypothesis. For example, as we are going to see in the next tables the main corridors from UK were made up by Commonwealth associated countries, from France to former colonies in the Maghreb region, and from Spain were made up by Central and South America countries (colonized by Spain up the 18<sup>th</sup> century).

In most of the cases (UK, France, Spain, Germany, Portugal and the Netherlands), two recipients countries account for more than 30 percent of total remittance flows. We identified these pairs as the main corridors of each EU country. In the case of UK (see Table 10 for detailed results), Pakistan and India account for 36 percent of total remittances sent. The total amount sent to Pakistan from EU27 in 2004 was €700 MM and more than 90 percent was sent by UK. The same result is obtained for India. According to our estimations 75 percent of total remittance receipt in India from EU27 is sent by the UK. Other examples worth mentioning are Spain-Morocco, Spain-Ecuador, Spain-Colombia, France-Morocco, France-Algeria, Germany-Turkey, German-Serbia, Portugal-Brazil, Netherland-Morocco, Netherland-Turkey, Belgium-Morocco, Austria-Bosnia, Austria-Turkey, and Italy-Senegal, Italy-Romania.<sup>8</sup>

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<sup>8</sup> For a detailed description of the whole matrix of remittances flows by pairs of origin - destination countries for 2004 we attach Tables C2 to C6 in excel spreadsheets. They present figures for all the possible scenarios.

**Table 10: Main corridors - UK -**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
<b>Pakistan</b>	<b>346.9</b>	<b>8.81%</b>
<b>India</b>	<b>327.4</b>	<b>8.32%</b>
Jamaica	197.3	5.01%
Ireland	187.8	4.77%
Nigeria	185.8	4.72%
Zimbabwe	167	4.24%
Australia	162.1	4.12%
United States	137.5	3.49%
Ghana	136.2	3.46%
South Africa	119.2	3.03%

**Table 11: Main corridors - Spain -**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
<b>Morocco</b>	<b>921</b>	<b>22.83%</b>
<b>Colombia</b>	<b>658.5</b>	<b>16.32%</b>
<b>Ecuador</b>	<b>571.4</b>	<b>14.16%</b>
Romania	310.6	7.70%
Bolivia	139	3.45%
Dominican Republic	126.8	3.14%
Brazil	99	2.45%
Peru	91.4	2.27%
Algeria	73.3	1.82%
Venezuela, RB	40.3	1.00%

**Table 12: Main corridors - France -**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
<b>Morocco</b>	<b>1431</b>	<b>28.83%</b>
<b>Algeria</b>	<b>538.3</b>	<b>10.85%</b>
Portugal	964	19.42%
Tunisia	157.2	3.17%
Congo, Rep.	130.9	2.64%
Spain	318.7	6.42%
Congo, Dem. Rep.	69.3	1.40%
Cameroon	56.4	1.14%
Turkey	159.9	3.22%
Senegal	60.6	1.22%

**Table 13: Main corridors - Germany-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
<b>Turkey</b>	<b>1667.7</b>	<b>29.05%</b>
<b>Poland</b>	<b>686.8</b>	<b>11.96%</b>
Serbia and Montenegro	384	6.69%
Greece	167.2	2.91%
United States	155.7	2.71%
Croatia	155.2	2.70%
Afghanistan	148	2.58%
Romania	119.8	2.09%
Bosnia and Herzegovina	118.7	2.07%
Ukraine	101.4	1.77%

**Table 14: Main corridors – Italy-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
<b>Albania</b>	<b>509.9</b>	<b>26.24%</b>
<b>Romania</b>	<b>181.1</b>	<b>9.32%</b>
Senegal	115	5.92%
Nigeria	109.5	5.63%
Tunisia	103.7	5.34%
India	75.6	3.89%
Egypt	57.4	2.95%
Ghana	49.1	2.53%
Colombia	17.9	0.92%
Morocco	11.9	0.61%

**Table 15: Main corridors – Portugal-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
Brazil	166.2	45.94%
Ukraine	95.4	26.37%
Moldova	23.2	6.41%
Angola	16.9	4.67%
Cape Verde	10.8	2.99%
Venezuela	4.6	1.27%
Sao Tome and Principe	7.9	2.18%
Spain	3.5	0.97%
United Kingdom	3.6	1.00%
Morocco	1	0.28%

**Table 16: Main corridors – The Netherlands-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
Morocco	182.8	21.85%
Turkey	95.1	11.36%
Germany	58	6.93%
Poland	53.3	6.37%
United Kingdom	36.5	4.36%
Suriname	25.5	3.05%
United States	23	2.75%
Belgium	10.9	1.30%
Spain	17	2.03%
Egypt	13	1.55%

**Table 17: Main corridors - Belgium-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
Morocco	256.8	27.52%
France	107.7	11.54%
Turkey	122.6	13.14%
Netherlands	48.5	5.20%
Algeria	30.9	3.31%
Spain	37.6	4.03%
Poland	53.6	5.74%
United States	26.4	2.83%
Germany	23.6	2.53%
Greece	26.9	2.88%

**Table 18: Main corridors – Austria-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
Germany	107.1	14.30%
Serbia and Montenegro	89.2	11.91%
Turkey	70.4	9.40%
Poland	60.9	8.13%
Bosnia and Herzegovina	60.4	8.06%
Romania	42.1	5.62%
Croatia	30.9	4.13%
Slovak Republic	22.9	3.06%
Egypt	15.4	2.06%
Nigeria	13.4	1.79%

**Table 19: Main corridors – Greece-**

<i>Country</i>	<i>Remittances 2004 MME</i>	<i>As % of total remittance</i>
Albania	84.5	56.03%
United States	16.4	10.88%
Georgia	11.2	7.43%
Romania	8.3	5.50%
Bulgaria	7	4.64%
Cyprus	4.7	3.12%
Ukraine	3.8	2.52%
Poland	2.4	1.59%
Turkey	1.6	1.06%
Pakistan	1.1	0.73%

*EU15-new members*

It is widely known that remittances strongly reflect the evolution of the migrant population. Immigrants from other EU countries have been increasing since 2000 in most EU15 countries. Therefore, remittances to these countries show the same trend during the period. Table 20 shows total remittance flows in 2000 and 2004 by origin country. Germany, Spain, Italy and UK are the countries that show the highest volume of remittances sent to new EU members.

**Table 20: Remittance flows from EU15 to new members (in MM of € of 2000).**

	2000		2004	
	MM of €	%	MM of €	%
Italy	735.27	48.90%	1037.05	42.10%
Austria	180.87	12.03%	389	15.79%
Luxembourg	112.84	7.50%	263.92	10.71%
Greece	50.64	3.37%	228.81	9.29%
Germany	135.34	9.00%	176.43	7.16%
Ireland	48.61	3.23%	89.67	3.64%
France	89.52	5.95%	85.92	3.49%
Spain	43.27	2.88%	77.24	3.14%
Portugal	40.98	2.73%	47	1.91%
United Kingdom	23.31	1.55%	25.88	1.05%
Sweden	22.15	1.47%	20.7	0.84%
Belgium	11.29	0.75%	10.47	0.43%
Netherlands	7.56	0.50%	8.46	0.34%
Finland	1.19	0.08%	2.07	0.08%
Denmark	0.78	0.05%	0.52	0.02%
<b>Total</b>	<b>1503.63</b>	<b>100%</b>	<b>2463.14</b>	<b>100%</b>
<b>Var. % 200-2004</b>				<b>63.93%</b>

Within the set new members the main recipient countries from EU15 in 2004 were Poland and Romania. These countries account for almost 74 percent of total remittances sent from EU15. Since remittance flows reflect strongly the main origin of immigrants, it is not a surprise that most remittances to Romania were sent from Spain; while immigrant residing in Germany sent mainly to Poland, Slovak Republic, Hungary and the Czech Republic (see Table 21 for details). Alternatively, the geographical breakdown of remittance flows to other EU countries is much more diversified.

**Table 21: Remittance flows from main countries of EU15 to new members in 2004  
(as percentage of total remittance inflows)**

<b>Destination Origin</b>	<b>Bulgaria</b>	<b>Cyprus</b>	<b>Czech Republic</b>	<b>Estonia</b>	<b>Hungary</b>	<b>Lithuania</b>	<b>Malta</b>	<b>Poland</b>	<b>Romania</b>	<b>Slovenia</b>	<b>Slovak Republic</b>
Austria	6.69	0.69	6.60	4.88	17.47	2.20	0.37	3.94	5.11	0.00	22.79
Belgium	1.62	0.00	0.89	0.00	2.17	0.52	0.00	2.29	1.06	0.00	0.00
Germany	37.59	2.89	43.62	31.10	49.36	57.64	4.98	60.26	16.15	0.00	66.03
Denmark	0.79	0.14	0.69	2.99	0.44	5.39	0.55	0.89	0.31	0.00	0.40
Spain	12.38	0.21	2.45	3.67	2.30	21.77	1.48	2.04	39.26	0.00	2.10
France	0.00	0.00	0.00	38.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greece	2.19	1.17	1.23	1.00	1.94	0.94	2.21	4.37	0.76	0.00	1.19
Ireland	8.81	28.15	0.00	0.00	0.00	0.00	0.00	0.52	1.15	0.00	0.00
Italy	0.35	0.14	0.73	1.68	0.33	3.00	0.92	0.20	0.63	1.74	0.27
Luxembourg	6.74	0.34	3.32	1.84	3.86	2.22	6.83	6.06	31.58	90.70	4.78
Netherlands	0.00	0.00	0.19	0.00	0.00	0.14	0.00	0.00	0.00	7.56	0.00
Portugal	3.33	0.21	3.17	2.62	3.01	1.78	3.69	4.17	1.18	0.00	2.01
Sweden	0.17	0.07	0.03	0.05	0.18	0.02	0.74	0.02	0.17	0.00	0.05
United Kingdom	0.65	1.03	0.84	12.11	3.35	4.37	4.24	2.61	0.55	0.00	0.37
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

**Table 22: Remittance flows from main countries of EU15 to new members in 2004  
(as percentage of total remittance inflows)**

<b>Destination Origin</b>	<b>Bulgaria</b>	<b>Cyprus</b>	<b>Czech Republic</b>	<b>Estonia</b>	<b>Hungary</b>	<b>Lithuania</b>	<b>Malta</b>	<b>Poland</b>	<b>Romania</b>	<b>Slovenia</b>	<b>Slovak Republic</b>	<b>Total</b>
Austria	8.28	0.09	5.60	0.83	12.89	0.98	0.02	26.31	30.09	0.00	14.89	100.00
Belgium	7.69	0.00	2.91	0.00	6.12	0.89	0.00	58.48	23.91	0.00	0.00	100.00
Germany	6.73	0.05	5.35	0.77	5.27	3.72	0.03	58.10	13.75	0.00	6.24	100.00
Denmark	7.62	0.14	4.57	3.95	2.49	18.64	0.21	46.15	14.21	0.00	2.01	100.00
Spain	5.56	0.01	0.75	0.23	0.62	3.52	0.03	4.93	83.86	0.00	0.50	100.00
France	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Greece	6.69	0.38	2.58	0.42	3.53	1.04	0.27	72.03	11.13	0.00	1.92	100.00
Ireland	44.00	14.74	0.00	0.00	0.00	0.00	0.00	13.87	27.39	0.00	0.00	100.00
Italy	5.32	0.22	7.49	3.47	2.93	16.29	0.54	16.50	44.73	0.33	2.17	100.00
Luxembourg	3.38	0.02	1.14	0.13	1.16	0.40	0.13	16.39	75.42	0.57	1.27	100.00
Netherlands	0.00	0.00	47.37	0.00	0.00	18.42	0.00	0.00	0.00	34.21	0.00	100.00
Portugal	8.87	0.06	5.78	0.96	4.78	1.71	0.38	59.75	14.88	0.00	2.82	100.00
Sweden	12.78	0.56	1.67	0.56	8.33	0.56	2.22	7.22	63.89	0.00	2.22	100.00
United Kingdom	2.75	0.46	2.44	7.06	8.46	6.66	0.70	59.64	11.00	0.00	0.82	100.00

## 5.6. Future trends

We have repeatedly mentioned that remittance trends strongly depends on the evolution of the number of immigrants, on immigrant's disposable income in the host country, on the income of their family in home countries and on the number of years they have been living in the host country. Future trends in these variables will significantly affect the growth of remittances flows. Therefore, immigrant policies applied by EU member states can affect, in a non-negligible manner, remittances flows outside EU. In recent years, international migration to EU15 has been continuously increasing and we have observed the same trend for remittance flows. The WB estimate that *"...official remittance flows will continue to rise at the 7-8 percent annual rate seen during the 1990...Growing income levels in the host countries and rising costs of living in receiving countries, together with the falling costs of remittances, would also imply larger remittances, especially though recorded channels."* (Global Economic Prospect, 2006 pp. 93).

From our estimations we obtain that remittances have an annual average growth of 5 percent during the period and remain increasing from €25.2 billion in 2004 to €26.7 billion in 2005 (5.5 percent of increase), in our most plausible scenario. This result is driven by the increase in the number of immigrants. Spain is the country with the highest growth in the number of immigrants between 2004 and 2005 and total remittances accounted almost to 5 € billion. This figure represents 16 percent more than the corresponding one to (2004). Our opinion is that the Regularization of Immigrants Law coming into force in 2004 partly contributed to this huge increase although it remains an open question. First, illegal immigrants that were not reported in official statistics before the regularization start to appear. Second, this law would have a *"call effect"* on potential illegal immigrants that decide to come due to the expectation of becoming legal shortly. We have also seen that changes in the immigration laws have had an effect in other countries such as Italy and Portugal.

Another important area of research will be the channels that immigrants used to transfer money to their families. Nowadays, at least 4 channels are used to make transfers (banks, other financial transfer operators, post offices, cash and other informal mechanisms). Transfer's costs and legal restrictions to send money home are two of the main determinants of the amount to be transferred.

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**Appendix A****Table A.1: Remittances data in MM of € of 2000.**

<i>Origin Ctry</i>	<i>Recipient Ctry</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>
BE	CO				2.54		
BE	EC				3.27	4.91	5.83
BE	IL			2.46	0.56	0.26	0.31
BE	MA			200.38	170.59	214.34	323.09
BE	PE				3.1	0.52	0.61
BE	TN			0.27		0.26	0.61
CY	EG			0.48	0.84	1.02	1.18
CY	GE			0.08	0.24	0.28	0.32
CY	LB			0.19	0.56	0.24	0.24
CY	LY			0.03	0.04	0.12	0.2
CY	MD			0.16	0.48	0.85	1.22
CY	SR			0.38	0.6	0.45	0.45
CY	SY			0.91	0.64	0.98	1.3
CY	UA			0.24	0.52	0.85	1.18
DE	LB	17.27	28.15	23.72	25.51	23.83	21.01
DE	MA	103.65	63.33	81.33	70.15	62.54	55.16
DE	TN	24.18	24.63	23.72	22.32	20.85	18.39
DE	UA	17.27	42.22	50.83	60.59	62.54	60.41
ES	AR		56		41	43	
ES	BG				10	12	
ES	BO		17		81	176	
ES	BR		74		90	144	
ES	CO		408		682	684	
ES	DO		109		127	155	
ES	EC		598		678	722	
ES	MA		145		731	731	
ES	PE		98		61	77	
ES	RO		120	120	130	181	188
ES	US		8		15	5	
FR	DZ	609.63	579.16	539.64	482.81	482.24	477.42
FR	MA	1464.31	1661.12	1415.57	1284.27	1281.99	1268.43
FR	TN	185.28	175.02	159.02	140.01	140.85	140.42
GR	BY				0.48	1.97	6.72
GR	EG	2.94	3.5	1.92	1.74	1.18	2.37
GR	IL	0.33	0.95	0.58	0.63	3.55	1.26
GR	JO	2.94	4.77	1.35	1.58	0.99	1.98
GR	LB	4.9	10.18	3.65	4.59	4.74	9.49
GR	UA	0.33	1.59	2.31	2.53	2.37	4.74
HU	IL	0.06	0.07	0.08	0.05	0.04	0.04
HU	UA	0.16	0.04		0.02	0.12	0.2
IE	BR			5.72	7.04	6.88	5.93
IE	BY			3.61	4.43	4.33	3.74
IE	MD			3.11	3.78	3.69	3.19
IE	UA			8.43	10.43	10.19	8.79

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<i>Origin Ctry</i>	<i>Recipient Ctry</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>
IT	AL					372	
IT	AR	3	2.99	1.56	3.37	1.97	2.23
IT	BR	3	5.24	4.67	5.62	7.86	8.91
IT	CO					17.69	40.09
IT	EC	1.8	6.73	5.44	9	37.35	66.82
IT	EG	4.8	6.73	5.44	9	37.35	66.82
IT	MA	28.78	52.37	34.99	49.48	7.86	8.91
IT	PE	3.6	3.74	3.89	5.62	7.86	8.91
IT	UA	1.8	4.49	3.11	1.12	3.93	6.68
IT	VE	2.4	3.74	2.33	4.5		
LT	BY	0.07	0.08	0.1	0.5	0.11	0.11
LT	MD	0.01	0.01	0.01	0.07	0.02	0.01
LT	UA	0.28	0.33	0.38	1.97	0.43	0.42
LV	AM	0.02	0.01	0.01	0.01	0.01	0.01
LV	BY	0.11	0.17	0.22	0.21	0.27	0.29
LV	IL	0.02	0.01	0.01	0.01	0.02	0.02
LV	MD	0.06	0.06	0.05	0.04	0.05	0.04
LV	UA	1.06	1.05	0.99	0.82	0.9	0.89
NL	MA	220.87	225.58	237.08	247.18	166.66	182.67
NL	SR					26	
PL	BY					0.18	
PL	SY					0.08	
PT	BR	45.26	62.12	102.25	188.58	234.48	313.97
PT	GE		0.82	2.13	2.24	1.82	2.06
PT	MA	2.11	1.63	2.13	2.69	3.19	4.12
PT	MD	10.55	35.15	28.12	23.29	17.3	19.59
PT	UA	2.88	174.5	158.49	103.47	71.03	80.43
PT	VE	4.99	6.13	4.26	0.9	1.37	2.06
SI	AR					0	0
SI	BR					0.04	0.04
SI	UA					0.01	0.01
UK	BD				359		
UK	CN		310				
UK	GH					300	
UK	NG					381	
UK	PK					946	

Sources: Second EU Survey on worker's remittances, micro-level surveys data

**Table A.2. Immigrants**

<b>Ctry</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
AT	0.674	0.679	0.684	0.690	0.690	0.700	0.705
BE	0.619	0.620	0.592	0.590	0.590	0.598	0.603
BG	0.015	<b>0.015</b>	<b>0.015</b>	<b>0.015</b>	<b>0.015</b>	<b>0.015</b>	<b>0.015</b>
CY	0.011	0.011	0.011	0.011	0.011	0.011	0.011
CZ	0.194	0.180	0.165	0.152	0.152	0.202	0.237
DE	6.161	6.131	6.106	6.102	6.102	6.101	5.601
DK	0.201	0.202	0.204	0.209	0.393	0.210	0.207
EE	0.008	0.008	0.008	0.008	0.008	0.008	0.008
ES	0.771	1.004	1.475	1.876	1.876	2.616	3.199
FI	0.039	0.042	0.045	0.047	0.049	0.051	0.053
FR	2.952	2.952	4.199	2.952	2.952	2.952	2.952
GR	0.640	0.640	0.640	0.640	0.640	0.640	0.640
HU	0.121	0.124	0.095	0.103	0.097	0.121	0.120
IE	0.246	0.246	0.246	0.246	0.291	0.247	0.242
IT	0.966	1.142	1.320	1.551	1.781	2.447	2.675
LT	0.116	0.098	0.080	0.062	0.062	0.026	0.008
LU	0.145	0.145	0.146	0.145	0.146	0.149	0.151
LV	0.210	0.160	0.109	0.059	0.059	0.012	0.013
MT	0.008	0.008	0.009	0.009	0.009	0.010	0.011
NL	0.508	0.511	0.515	0.519	0.519	0.535	0.539
PL	0.033	0.029	0.029	0.029	0.029	0.029	0.029
PT	0.233	0.267	0.424	0.334	0.334	0.350	0.474
RO	0.022	0.022	0.022	0.022	0.022	0.022	0.023
SE	1.320	0.289	0.290	0.292	0.292	0.297	0.305
SI	0.035	0.035	0.035	0.035	0.037	0.037	0.035
SK	0.042	0.038	0.035	0.031	0.031	0.024	0.020
UK	1.554	1.565	1.614	1.667	1.673	1.893	2.012
<b>Total</b>	<b>17.845</b>	<b>17.162</b>	<b>19.112</b>	<b>18.395</b>	<b>18.861</b>	<b>20.303</b>	<b>21.891</b>

Note.

1. We do not include the total number of immigrants, only those pairs of countries for which we have information on immigrants.

**Table A.3.a: Host country average wages and salaries (excluding apprentices) in full time units, per month**

Immigrants destination Country	Average wage -2000	Average Wage - 2004	Average wage 2000, 2001 constant prices	Average wage 2004, 2001 constant prices
AT	na	2,430		
BE	na	2,273		
BG	131	143	134	134
CY	1,394	1,412	1,427	1,324
CZ	412	524	422	491
DE	na	2,508		2,352
DK	na	2,898		2,718
EE	317	425	325	399
ES	na	1,609		1,509
FI	2,555	2,214	2,616	2,076
FR	na	2,081		1,951
GR	1,332	1,450	1,364	1,360
HU	360	532	369	499
IE	na	2,772		2,599
IT	na	2,078		1,949
LT	275	312	282	293
LU	na	3,149		2,953
LV	na	299		280
MT	na	1,233		1,156
NL	2,461	2,576	2,519	2,416
PL	490	491	502	460
PT	na	1,195		1,121
RO	150	193	154	181
SE	na	2,356		2,209
SI	1,097	1,069	1,123	1,002
SK	304	370	311	347
UK	2,917	2,778	2,986	2,605

**Note.**

1. Do not include wages in agriculture, fishing, public administration, private households and extra-territorial organizations. Include data on firms with 10 or more employees. Source: Eurostat, 2007

**TableA.3.b: Immigrants' average wages by origin region in host region.**  
**Year=2001**

Destination Country	Immigrants Origin Regions							
	EU	Other European Countries	Africa	América del Norte	Central and South America	Middle East	Australia Oceania	Other Asian countries
AT	1,525	1,581	1,065	1,490	952	1,182	1,162	1,393
BE	2,402	1,832	1,669	1,872	1,644	1,770	1,583	2,086
BG	905	909	609	805	686	682	630	826
CY	1,266	1,273	852	1,127	961	955	882	1,157
CZ	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
DE	1,937	2,009	1,352	1,892	1,210	1,501	1,476	1,769
DK	2,880	3,106	2,223	2,712	3,019	1,449	1,609	2,550
EE	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
ES	2,041	1,178	865	913	815	1,319	628	1,555
FI	1,744	1,808	1,217	1,703	1,089	1,351	1,329	1,593
FR	1,456	1,066	1,252	1,287	1,918	1,610	1,442	1,392
GR	864	895	603	844	539	669	658	789
HU	905	909	609	805	686	682	630	826
IE	1,864	2,141	718	1,249	1,328	1,647	1,100	1,935
IT	1,335	1,384	932	1,304	834	1,035	1,017	1,219
LT	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
LU	2,496	2,226	1,738	2,177	1,638	1,884	1,766	2,220
LV	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
MT	1,266	1,273	852	1,127	961	955	882	1,157
NL	2,136	2,215	1,491	2,086	1,334	1,655	1,628	1,951
PL	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
PT	922	1,496	536	471	1,089	587	1,075	692
RO	905	909	609	805	686	682	630	826
SE	2,312	2,457	1,720	2,208	2,054	1,400	1,469	2,071
SI	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
SK	1,447	1,454	974	1,288	1,098	1,091	1,008	1,322
UK	1,224	1,873	886	1,933	1,128	1,400	967	1,572

Source: Own calculation based on the ECHP.

**Table A.4: Tax rates**

<b>Destination Country</b>	<b>Minimum Marginal Tax Rate</b>	<b>Effective Tax Rate assuming that 25% of immigrants do not pay income tax</b>
AT	0.380	0.285
BE	0.270	0.203
BG	0.200	0.150
CY	0.200	0.150
CZ	0.120	0.090
DE	0.150	0.113
DK	0.440	0.330
EE	0.220	0.165
ES	0.160	0.120
FI	0.130	0.097
FR	0.200	0.150
GR	0.150	0.113
HU	0.180	0.135
IE	0.220	0.165
IT	0.180	0.135
LT	0.150	0.113
LU	0.100	0.075
LV	0.250	0.188
MT	0.150	0.113
NL	0.340	0.255
PL	0.190	0.142
PT	0.120	0.090
RO	0.160	0.120
SE	0.250	0.188
SI	0.160	0.120
SK	0.150	0.113
UK	0.220	0.165
<b>Total</b>	<b>0.202</b>	<b>0.162</b>

**Appendix B****Table B.1: Average  $\delta$  for EU 15 countries**

<b>Ctry</b>	<b>EU 27 countries</b>	<b>Other Eroupean countries</b>	<b>Africa</b>	<b>North America</b>	<b>Central and South America</b>	<b>Near East</b>	<b>Other countries-Asia</b>	<b>Australia - Oceania -Others</b>	<b>Total</b>
AT	0.63	0.65	0.44	0.61	0.39	0.49	0.48	0.57	<b>0.5</b>
BE	1.06	0.81	0.73	0.82	0.72	0.78	0.7	0.92	<b>0.78</b>
DE	0.77	0.8	0.54	0.75	0.48	0.6	0.59	0.71	<b>0.61</b>
DK	0.99	1.07	0.77	0.94	1.04	0.5	0.56	0.88	<b>0.84</b>
ES	1.27	0.73	0.54	0.57	0.51	0.82	0.39	0.97	<b>0.65</b>
FI	0.74	0.76	0.51	0.72	0.46	0.57	0.56	0.67	<b>0.58</b>
FR	0.7	0.51	0.6	0.62	0.92	0.77	0.69	0.67	<b>0.69</b>
GR	0.62	0.64	0.43	0.61	0.39	0.48	0.47	0.57	<b>0.49</b>
IE	0.67	0.77	0.26	0.45	0.48	0.59	0.4	0.7	<b>0.48</b>
IT	0.64	0.67	0.45	0.63	0.4	0.5	0.49	0.59	<b>0.51</b>
LU	0.79	0.71	0.55	0.69	0.52	0.6	0.56	0.7	<b>0.61</b>
NL	0.85	0.88	0.59	0.83	0.53	0.66	0.65	0.78	<b>0.67</b>
PT	0.77	1.25	0.45	0.39	0.91	0.49	0.9	0.58	<b>0.74</b>
SE	0.98	1.04	0.73	0.94	0.87	0.59	0.62	0.88	<b>0.81</b>
UK	0.43	0.66	0.31	0.68	0.4	0.49	0.34	0.55	<b>0.43</b>
<b>Total</b>	<b>0.794</b>	<b>0.797</b>	<b>0.527</b>	<b>0.683</b>	<b>0.601</b>	<b>0.595</b>	<b>0.560</b>	<b>0.716</b>	<b>0.626</b>

**Table B.2.a :  $\delta$  OLS regression (including only EU15 countries)**

Dependent variable is $\Delta_{rc}$	
Explanatory variables	Coefficient (Standard error)
Female %	0.0325 (0.0260)
% Immigrants aged less than 29 (Flows)	0.1274** (0.0480)
% Immigrants between aged 35-59 (Flows)	-0.0177 (0.0605)
% Immigrants aged 59 and more (Flows)	-0.1310** (0.0339)
Immigrants from other European Countries	0.0280 (0.0197)
Immigrants from Africa	-0.2278** (0.0167)
Immigrants from North America	-0.0193 (0.0283)
Immigrants from Central and South America	-0.2330** (0.0241)
Immigrants from Near East	-0.2302** (0.0190)
Immigrants from other Asia countries	-0.2345** (0.0175)
Australia and Oceania	-0.0574* (0.0242)
Constant	0.2977** (0.0658)
Observations	721
R-squared	0.4461

Note.

1. Base Group: Immigrant's males, aged between 30-35 years from other EU15 countries
2. Robust standard errors are in parenthesis.
3. \* significant at 5 percent level; \*\* significant at 1 percent level

**TableB.2.b: Estimated average  $\delta$  for EU 27**

Ctry	EU 27 countries	Other European countries	Africa	North America	Central and South America	Near East	Other countries-Asia	Australia - Oceania -Others	Total
AT	0.66	0.67	0.58	0.64	0.56	0.59	0.59	0.62	<b>0.600</b>
BE	0.68	0.65	0.64	0.65	0.63	0.64	0.63	0.66	<b>0.640</b>
BG	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
CY	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
CZ	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
DE	0.64	0.65	0.61	0.64	0.6	0.62	0.62	0.63	<b>0.620</b>
DK	0.75	0.76	0.62	0.71	0.64	0.6	0.6	0.68	<b>0.650</b>
EE	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
ES	0.72	0.68	0.59	0.64	0.57	0.64	0.58	0.69	<b>0.620</b>
FI	0.67	0.68	0.58	0.66	0.56	0.61	0.6	0.64	<b>0.610</b>
FR	0.63	0.6	0.62	0.62	0.66	0.64	0.63	0.63	<b>0.630</b>
GR	0.62	0.63	0.57	0.62	0.55	0.58	0.58	0.6	<b>0.580</b>
HU	0.65	0.66	0.61	0.64	0.61	0.61	0.61	0.62	<b>0.620</b>
IE	0.63	0.64	0.57	0.6	0.6	0.62	0.59	0.63	<b>0.600</b>
IT	0.63	0.65	0.52	0.62	0.47	0.53	0.54	0.6	<b>0.550</b>
LT	0.63	0.63	0.62	0.62	0.62	0.61	0.62	0.62	<b>0.620</b>
LU	0.69	0.68	0.6	0.66	0.59	0.61	0.61	0.64	<b>0.620</b>
LV	0.63	0.63	0.62	0.63	0.62	0.62	0.62	0.62	<b>0.620</b>
MT	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
NL	0.68	0.69	0.61	0.68	0.59	0.63	0.63	0.66	<b>0.630</b>
PL	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
PT	0.67	0.75	0.58	0.61	0.64	0.6	0.65	0.62	<b>0.640</b>
RO	0.62	0.63	0.62	0.62	0.62	0.62	0.62	0.61	<b>0.620</b>
SE	0.71	0.73	0.62	0.7	0.63	0.62	0.61	0.67	<b>0.650</b>
SI	0.63	0.66	0.62	0.64	0.61	0.62	0.62	0.63	<b>0.620</b>
SK	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	<b>0.620</b>
UK	0.57	0.63	0.53	0.64	0.56	0.58	0.54	0.6	<b>0.560</b>
<b>Total</b>	<b>0.646</b>	<b>0.653</b>	<b>0.603</b>	<b>0.636</b>	<b>0.603</b>	<b>0.612</b>	<b>0.609</b>	<b>0.630</b>	<b>0.616</b>

**Table B.3.a: Descriptive statistics**

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Beta	0.1060281	0.1476789	0.000443	0.783765
LogGDPpc_Host_Ctry	0.7027027	0.4577563	0	1
LogGDPHost/LogGDPHome	8.626554	0.6297155	6.97354	10.5743
Immigrant Ratio Femmale % (Stock)	0.1996302	0.2224774	0	1.625
% Immigrants aged less than 24 (Flows)	0.3925864	0.1082034	0.073892	0.717004
% Immigrants between aged 35- 59 (Flows)	0.3906943	0.1337038	0	0.714286
% Immigrants aged 59 and more (Flows)	0.2338183	0.1545842	0	1
Immigrants from other European Countries	0.1049379	0.0920899	0	0.208296
Immigrants from Africa	0.1921922	0.3946163	0	1
% High educated immigrants	0.3174762	0.167292	0	0.752000
Immigrants from North America	0.009009	0.0946295	0	1
Immigrants from Central and South America	0.2432432	0.4296864	0	1
Immigrants from Near East	0.1951952	0.3969474	0	1
Survey Data	0.027027	0.1624062	0	1
	0.0810811	0.2733704	0	1

TableB.3.b:  $\beta$  OLS regression

	Beta		Log Beta		Log(Beta/(1-Beta))	
EU15	0.0492		1.1162		1.1787	
	(0.0186)**		(0.1935)**		(0.2129)**	
LogGDP_ogn	-0.0310		-0.2101		-0.2527	
	(0.0149)*		(0.1238)		(0.1409)	
LogGDP_host/LogGDPhome		0.2429		4.0646		4.3665
		(0.0957)*		(0.8448)**		(0.9508)**
Immigrant Ratio (Flow/Stock)	0.2763	0.2719	2.2607	2.2172	2.6697	2.6211
	(0.0614)**	(0.0610)**	(0.3939)**	(0.3910)**	(0.4783)**	(0.4687)**
Femmale % (Stock)	1.1113	1.1032	13.2484	12.2299	14.6084	13.5849
	(0.3097)**	(0.3083)**	(2.3095)**	(2.3604)**	(2.7261)**	(2.7774)**
% Immigrants aged less than 24 (Flows)	-0.2355	-0.1879	-5.3230	-4.2720	-5.5722	-4.4595
	(0.0692)**	(0.0639)**	(0.7872)**	(0.6898)**	(0.8452)**	(0.7410)**
% Immigrants between aged 35-59 (Flows)	-0.1798	-0.1612	-3.0343	-2.7355	-3.2443	-2.9190
	(0.0626)**	(0.0634)*	(0.5068)**	(0.5685)**	(0.5676)**	(0.6307)**
% Immigrants aged 59 and more (Flows)	-0.1536	-0.1126	-2.8150	-1.6898	-2.9319	-1.7559
	(0.0857)	(0.0880)	(0.7969)**	(0.7679)*	(0.8846)**	(0.8633)*
Immigrants from other European Countries	0.0645	0.0710	0.8449	1.0615	0.9291	1.1541
	(0.0215)**	(0.0193)**	(0.2284)**	(0.2206)**	(0.2501)**	(0.2383)**
Immigrants from Africa	0.0751	0.0843	1.1924	2.1800	1.2941	2.2847
	(0.0437)	(0.0325)**	(0.4639)*	(0.4479)**	(0.5096)*	(0.4800)**
Immigrants from North America	0.0515	0.0608	0.7807	1.1782	0.8423	1.2500
	(0.0171)**	(0.0154)**	(0.1651)**	(0.1790)**	(0.1821)**	(0.1927)**
Immigrants from Central and South America	0.1047	0.1101	0.9270	1.2584	1.0851	1.4209
	(0.0248)**	(0.0249)**	(0.1911)**	(0.2078)**	(0.2207)**	(0.2375)**
Immigrants from Near East	0.0896	0.0838	-0.6391	-0.9166	-0.4796	-0.7631
	(0.0569)	(0.0550)	(0.6084)	(0.6083)	(0.6797)	(0.6763)
Survey Data	0.1024	0.1134	0.9136	1.0993	1.0613	1.2621
	(0.0249)**	(0.0247)**	(0.1605)**	(0.1650)**	(0.1889)**	(0.1924)**
FemHighEduc%	-2.4561	-2.3587	-33.4507	-29.3601	-36.4676	-32.2691
	(0.9712)*	(0.9639)*	(7.2432)**	(7.3365)**	(8.5785)**	(8.6698)**
% Individ with at least tertiary education	0.9894	0.9294	13.1209	10.6732	14.3540	11.8407
	(0.3983)*	(0.3958)*	(2.9320)**	(2.9370)**	(3.4818)**	(3.4924)**
Constant	-0.0739	-0.6121	-5.3913	-11.3215	-5.4954	-12.1327
	(0.2057)	(0.1605)**	(1.5874)**	(1.3010)**	(1.8384)**	(1.4882)**
Observations	333	333	333	333	333	333
R-squared	0.3859	0.3707	0.4819	0.4366	0.4797	0.4378

**TableB.3.c: Predicted  $\beta$  by host country and years**

Ctry	1999	2000	2001	2002	2003	2004	2005
AT	0.11	0.11	0.11	0.11	0.11	0.11	0.12
BE	0.07	0.07	0.07	0.07	0.07	0.07	0.07
BG	0.03	0.03	0.03	0.03	0.03	0.03	0.02
CY	0.04	0.04	0.04	0.04	0.04	0.05	0.05
CZ	0.08	0.08	0.08	0.09	0.08	0.08	0.07
DE	0.08	0.08	0.06	0.06	0.07	0.07	0.08
DK	0.13	0.13	0.12	0.12	0.12	0.11	0.11
EE	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ES	0.15	0.14	0.14	0.13	0.13	0.13	0.14
FI	0.09	0.09	0.09	0.09	0.09	0.08	0.09
FR	0.11	0.11	0.11	0.11	0.11	0.11	0.11
GR	0.06	0.06	0.06	0.06	0.06	0.06	0.06
HU	0.05	0.05	0.05	0.06	0.07	0.07	0.07
IE	0.11	0.11	0.11	0.11	0.11	0.11	0.11
IT	0.09	0.09	0.09	0.09	0.09	0.08	0.09
LT	0.03	0.03	0.03	0.03	0.03	0.03	0.03
LU	0.11	0.11	0.11	0.11	0.11	0.11	0.11
LV	0.04	0.04	0.04	0.04	0.04	0.04	0.03
MT	0.03	0.03	0.03	0.02	0.02	0.02	0.02
NL	0.14	0.14	0.13	0.13	0.12	0.12	0.12
PL	0.09	0.09	0.09	0.1	0.1	0.1	0.1
PT	0.1	0.09	0.09	0.1	0.1	0.1	0.1
RO	0.04	0.04	0.04	0.04	0.04	0.04	0.04
SE	0.12	0.11	0.11	0.11	0.11	0.12	0.12
SI	0.04	0.04	0.04	0.04	0.04	0.04	0.05
SK	0.05	0.05	0.05	0.05	0.05	0.05	0.05
UK	0.09	0.09	0.09	0.09	0.09	0.09	0.08
<b>Mean</b>	0.08	0.08	0.08	0.08	0.08	0.08	0.08