WORKERS' REMITTANCES IN THE SPANISH BALANCE OF PAYMENTS

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*Introduction*

In recent years international flows of workers' remittances have been receiving growing attention, in step with their constant increase, as a stable source of financing in certain developing countries, and with their notable economic and social impact. This attention has naturally spread to the statistics that measure this type of transaction. In this respect the Balance of Payments, which records real and financial transactions between an economy's residents (whether immigrants or not) and non-residents, is a fundamental point of reference for quantifying remittances. Nonetheless, the information on workers' remittances in the Balance of Payments is not free from limitations.

Broadly, these limitations come to light first, on comparing the figures under the heading Workers' remittances in the Balance of Payments of the different countries with their main economic, financial and cultural determinants and with that of other available indicators; and further, on comparing the data of the main remittance issuing and recipient countries. The awareness of these limitations and the growing demand for figures on workers' remittances have prompted the competent international agencies to initiate a process of revision of the conceptual framework and of the methods used to obtain the Workers' remittances heading.

The case of the Spanish Balance of Payments is no exception here. Comparisons with other indicators of the figures from the heading Workers' remittances, which the Balance of Payments had been including, highlighted a potential underestimation of debits and an overestimation of credits in this heading. These results reflect the problems of properly estimating workers' remittances using reporting systems based essentially on the filing of foreign proceeds and payments made through credit institutions and foreign accounts (the so called International Transactions Reporting System-ITRS). This is the procedure that the Spanish Balance of Payments has been using and it is, probably, the most common one used internationally. But it faces serious problems derived from the presence of exemption thresholds, which are high for the reporting of individual transactions, and from the sending via so-called remittance companies[1], or unofficial channels, of a significant proportion of the funds relating to remittances. The use of these procedures makes it difficult to capture this information and allocate it correctly, both in the related Balance of Payments heading and, geographically, according to the destination or source of the remittances.

Likewise, in Spain's case, the importance of revising calculation procedures, especially those affecting debits under this heading, was clearly apparent in view of the notable dynamism of the immigrant population in recent years and their impact on the sending of remittances. Specifically, in the period 2001-2004, the number of immigrants in Spain grew at an annual average rate of 35.3%, according to municipal census figures.

This article sets out the work undertaken to evaluate the quality of the debits figures under the Spanish Balance of Payments Workers' remittances heading and to improve the estimate thereof.

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**1.** This article uses the term "remittance companies" to refer to the authorised Money Transfer Operators. Although these establishments are regulated by and registered at the Banco de España, to which they regularly provide information on their operations, in other countries the lack of specific regulation places them in the realm of unofficial channels.

First, an estimate is made of the maximum flow of remittances abroad (potential remittances). Second, following the analysis of the procedures used by different countries, an alternative calculation method is described for these remittances based on a panel data econometric model which, in addition to the information from the ITRS, uses that available on the characteristics of the immigrant population and on the economies from which they have come. This new method has helped reduce the uncertainty intrinsic to estimates to date and, along with the analysis and use of other alternative information sources (information on funds channelled through Money Transfer Operators and remittance credits of the main counterpart countries), has enabled the underestimation of remittance payments from Spain in the period 2001-2004 to be corrected. In April 2006, coinciding with the revision of the figures for 2005, the data under this heading in this period were revised, entailing an increase in debits of around 20%.

The article is structured as follows. Section 2 analyses developments in the Workers' remittances heading in the Spanish Balance of Payments. Section 3 compares this heading with other indicators, in order to detect potential biases. Section 4 makes an estimate of the maximum flow of remittances sent abroad drawing on the characteristics of the immigrant population in Spain. Section 5 details an alternative calculation method involving the estimation of an equation for remittances sent from Spain to the principal destinations and sets out the results obtained. Finally, section 6 draws conclusions.
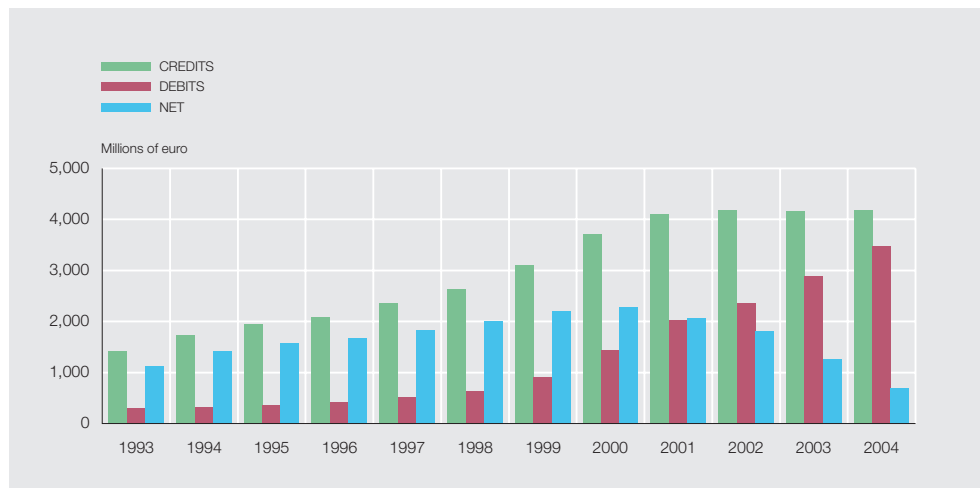
*The Workers' remittances heading in the Balance of Payments*

Prior to the April 2006 revision, the surplus in the Balance of Payments heading Workers' remittances, after holding stable at around 0.4% of GDP during the period 1993-2000, had fallen significantly in recent years, accounting for only 0.1% of GDP in 2004. The main influential factor here was the behaviour of debits. Charts 1 and 2 show that, until 1999, both debits and credits trended similarly, their weight in terms of GDP holding up, whereas thereafter debits increased significantly and credits, by contrast, did so at a much more moderate rate.

The differing course of credits and debits is due to the different times at which the emigration and immigration processes came about in Spain. Thus, if we focus on the second half of the 20th century, Spanish emigration can be seen to have been concentrated in the 50s and 60s and, thereafter, the Spanish population resident abroad has been on a declining path[2] (see Charts A1 and A2 in annex A). Conversely, immigration is a relatively recent phenomenon which, in the Spanish case, and unlike other European countries, has peaked in recent years[3].

The recent changes in migratory flows have not only affected the level of debits in the Workers' remittances heading, but have also thoroughly altered their geographical allocation. In 2004, using data prior to the April 2006 revision, Latin America was the destination of 50.6% of the total remittances sent from Spain, according to Balance of Payments estimates, while in 1994 only 13.7% of the total was routed to Latin American countries. These data confirm the growing significance these flows are acquiring in some countries as alternative sources of financing to other resources (e.g. direct investment or tourism). Conversely, the weight of the EU Member States as recipients of remittances from Spain has diminished from 35.0% of the total to 5.1% over the same period.

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**2.** According to official data on migration (Anuario de Migraciones, Ministerio de Trabajo y Asuntos Sociales) and to records of residents registering with Spanish consulates, 649,039 Spaniards emigrated abroad in the 1950s, 929,662 in the 1960s, 492,991 in the 1970s, 195,944 in the 1980s, and only 27,683 in the 1990s. From 1993 to 2004, the Spanish population abroad fell from 2,327,759 to 1,497,817. The changes in the Spanish population stock abroad might be affected by the methodological change that came about in 1996 further to the creation of the Census of Spanish residents abroad (PERE by its Spanish name), compiled on the basis of data from consular records. The integration of the PERE information with that from the Spanish municipal censuses, and the subsequent update of the consular records would account for the decline that these records show.   **3.** According to municipal census figures dated 1 January 2005, the foreign population as a proportion of the total population in Spain was 8.6%, compared with 2.2% in 2000. In Austria, Germany and Belgium, these percentages were already 9%, 8.8% and 9%, respectively, in 1995 (OECD, Factbook 2005).

WORKERS' REMITTANCES                                                        CHART 1



SOURCE: Banco de España. Data prior to the April 2006 revision of remittance debits figures.


WORKERS' REMITTANCES: WEIGHT IN GDP                                         CHART 2
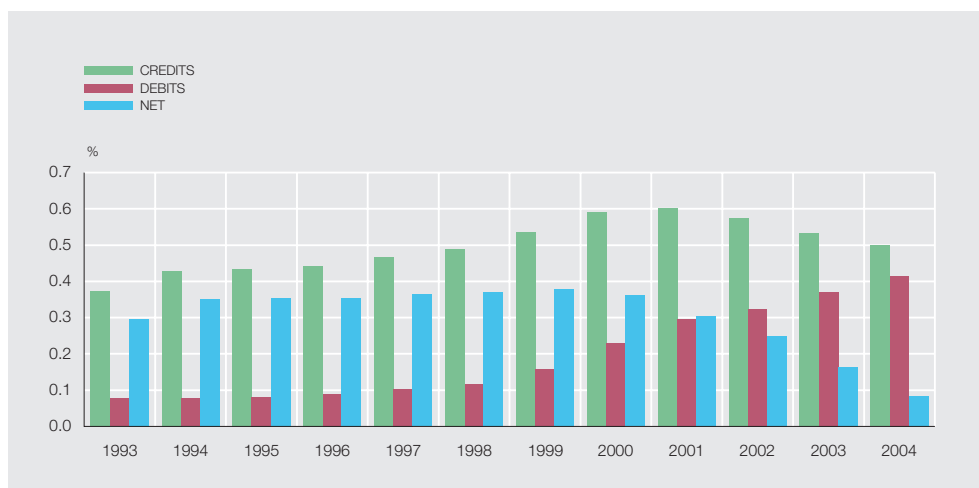


SOURCES: Banco de España and INE. Data prior to the April 2006
revision of remittance debits figures.


Although the trends revealed by the Balance of Payments figures reflected the change in the Spanish population's structure, the growing problems faced in properly measuring real and financial transactions by immigrants and the need for more reliable and detailed information on the phenomenon made it necessary to refine the estimation methods for the Workers' remittances heading, as set out below.

*Difficulties in estimating the Workers' remittances heading*

As indicated in the previous section, before the April 2006 revision the Spanish Balance of Payments figures appeared to reflect appropriately the population changes which, as a result of migratory flows, have taken place in our country in recent years. Nonetheless, it is not clear that they reflected such changes in all their intensity. An analysis of the credits and debits recorded in this statistic and the cross-checking thereof against some of the alternative information sources available suggested that the remittance credits figure in the Spanish Balance of Payments might be overestimated while that of debits might be underestimated.
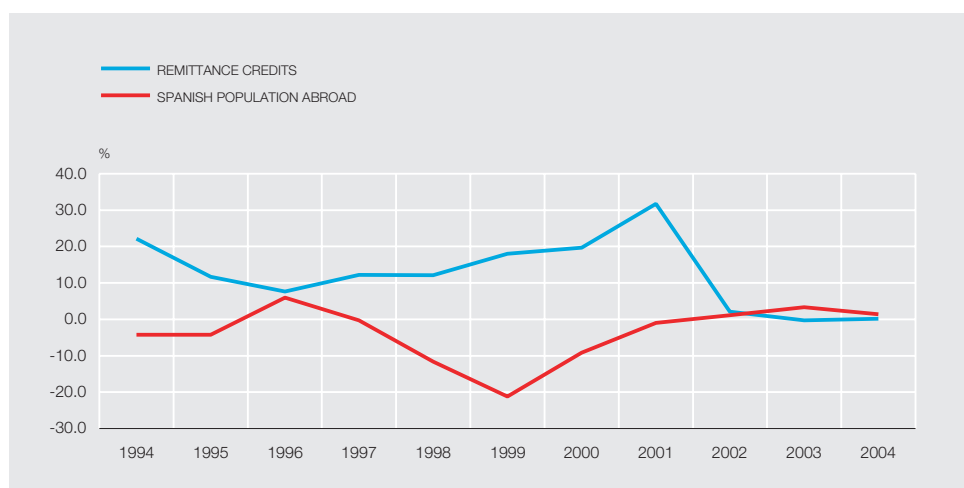
SOURCES: Banco de España and Spanish Consular Records (Ministerio de Asuntos Exteriores y Cooperación).

REMITTANCE CREDITS: AVAILABLE EVIDENCE

One indicator of the potential overestimation of credits is the discrepancy between the Balance of Payments remittances figures and the figures for Spaniards abroad. Chart 3 shows the growth rates of remittance credits in the Balance of Payments and of the stock of Spaniards resident abroad obtained from official consular records.

In the period 1994-2001, and with the exception of 1996, the rate of change of the stock of Spaniards abroad was negative while that of remittance credits showed significant growth, peaking in 2001 with an annual rate of change of 31.7%[4]. In this period, remittance credits grew at an annual average rate of 16.9%, while the related rate for the population stock was -5.7%. From 2001, both credits and the population stock tended to stabilise. Considering the entire period from 1994 to 2004, the annual average growth rate of credits was 12.5% and that of the Spanish population stock abroad was -3.6%.

A similar conclusion, i.e. that Spanish remittance credits are overestimated, is drawn in Britton, Harrison y Swanson (2004). This paper compares the credits published by Spain with an alternative estimate that considers the remittance debits published by countries in which Spanish emigrants are resident and the proportion of the Spanish population in the total immigrant population in each of them[5].

REMITTANCE DEBITS: AVAILABLE EVIDENCE

In the case of debits, the evidence of a potential underestimation of the data would lie in the comparison with the information available on the trend and characteristics of the immigrant population in Spain, the significance of remittance credits in the Balance of Payments of the recipient countries of funds sent from Spain and the transfers abroad via remittance companies[6].

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**4.** The integration of the PERE information with that from Spanish municipal censuses, and the subsequent update of the consular records, as mentioned in footnote 3, might account for the heavy fall in the Spanish population stock from 1997, which peaked in 1999 (a decline of 21.2%). **5.** Although the paper points to an overestimation of Balance of Payments data of approximately 80%, the result should be viewed with caution. Firstly, a definition of the remittances variable that includes compensation of employees is assumed. Secondly, the paper assumes that the average remittance sent by emigrants in a country is the same irrespective of their nationality. Further, the result might be affected by the underestimation of the debits published by the counterpart countries. **6.** As previously indicated (see footnote 1), Money Transfer Operators provide information to the Banco de España Financial Reporting and Central Credit Register System Department on their transfer operations.
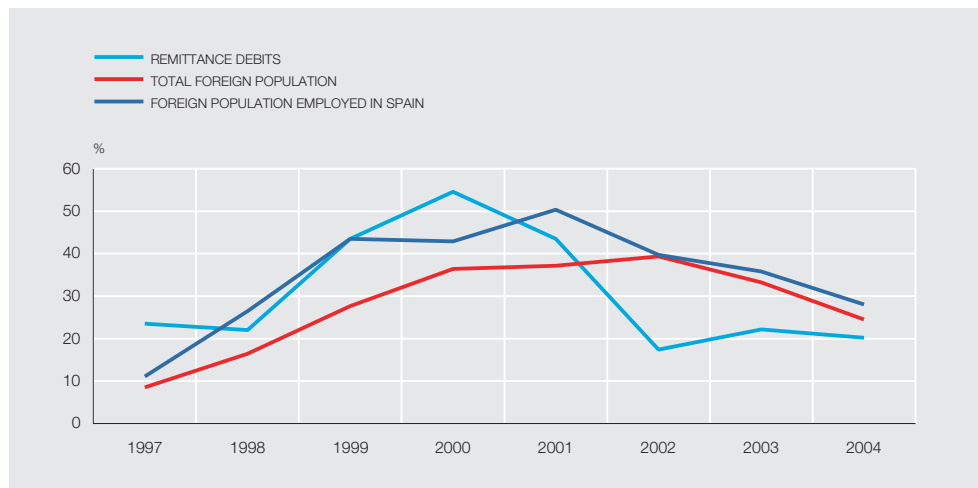
SOURCES: Banco de España and INE. Data prior to the April 2006
revision of remittance debits figures.

Remittance debits
and characteristics of the
immigrant population

Chart 4 shows the growth rates of Balance of Payments remittances and of the total and employed foreign population resident in Spain[7] for the period 1997-2004. The population figures have been obtained from the EPA 2005[8] (the new Spanish Labour Force Survey).

According to this chart, two different periods can be distinguished. In the first period (from 1997 to 2001), the remittance debits show higher growth rates than those of the foreign population, while in the second period, the latter exceed the former. In this second period, which runs from 2001 to 2004, the average growth rates of Balance of Payments remittance debits, total foreign population and employed foreign population are 25.8%, 33.5% and 38.5%, respectively. The widening gap in recent years between the dynamism of debits and the foreign (total and employed) population was an indicator of the likely underestimation in the Balance of Payments of funds sent abroad by foreign workers resident in Spain.

The significance of immigration, which is reflected by the 2005 EPA for recent years, is also evident in the other available information sources: the 2001 Census (and its projections for the years 2002-2004), the Municipal Census and the DGP (Directorate General of Police) records of foreigners resident in Spain, as can be seen in Table 1.

Remittance debits set against
recipient countries' credits

The moderate growth of remittance debits in the Spanish Balance of Payments from 2001 contrasted with the growing significance that the corresponding credits in the recipient economies have acquired. Table 2 shows the percentage of GDP accounted for by remittance credits in the Balance of Payments of the most significant countries from Spain's standpoint, both in terms of the weight of the total transfers sent abroad to these countries, and of the significance of the population from these countries as a proportion of the immigrants resident in Spain[9].

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**7.** Only the population considered as foreign in the EPA is considered; the population with dual nationality is excluded. In the period 1996-2004, the segment of the population with dual nationality accounted for an average percentage of 13% of the total foreign population, with a gradual loss in weight from 1997. Specifically, this population segment accounted for 7% of the total in 2004.    **8.** The EPA 2005 shows revised data on the total and employed foreign population for the period 1996-2004. For a detailed description of the methodological changes and of the main findings of this survey, see Quarterly Report on the Spanish Economy (Banco de España (2005a)).    **9.** The increase in the Dominican Republic's figures for 2003 is affected by the strong fall in GDP expressed in dollars for this country (25.5% in relation to 2002).

STOCK OF FOREIGN POPULATION ACCORDING TO THE EPA 2005, THE 2001 CENSUS,
THE MUNICIPAL CENSUS AND THE DGP RECORDS

| | EPA 2005 | 2001 CENSUS | MUNICIPAL CENSUS | DGP |
|---|---|---|---|---|
| 1996 | 400,150 | - | 542,314 | 540,649 |
| 1997 | 434,300 | - | n.d. | 611,697 |
| 1998 | 505,375 | - | 678,366 | 719,647 |
| 1999 | 645,200 | - | 748,953 | 801,329 |
| 2000 | 880,125 | - | 923,879 | 895,720 |
| 2001 | 1,207,075 | 1,548,941 | 1,370,657 | 1,109,060 |
| 2002 | 1,682,350 | 2,163,214 | 1,977,946 | 1,324,001 |
| 2003 | 2,241,325 | 2,728,240 | 2,664,168 | 1,647,011 |
| 2004 | 2,789,675 | 3,196,784 | 3,034,326 | 1,981,933 |

SOURCES: INE and Dirección General de Policía (Ministerio del Interior).

WEIGHT IN GDP OF THE REMITTANCE CREDITS OF SPAIN'S MAIN COUNTERPART COUNTRIES

| % | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Colombia | 1.2 | 0.9 | 0.8 | 0.7 | 0.8 | 1.5 | 1.9 | 2.3 | 2.9 | 3.9 | 3.4 |
| Ecuador | 1.5 | 1.9 | 2.3 | 2.7 | 3.4 | 6.5 | 8.3 | 6.7 | 5.9 | 5.7 | 5.4 |
| Bolivia | 0.0 | 0.0 | 0.0 | 0.9 | 0.8 | 0.9 | 1.2 | 1.3 | 1.0 | 1.3 | 1.3 |
| Peru | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.3 | 1.4 | 1.4 | 1.3 | 1.4 | 1.5 |
| Dominican Republic | 7.0 | 6.6 | 6.7 | 7.2 | 8.3 | 8.6 | 8.4 | 8.2 | 9.0 | 14.2 | 13.9 |
| Morocco | 6.0 | 6.0 | 5.9 | 5.7 | 5.6 | 5.5 | 6.5 | 9.6 | 8.0 | 8.2 | 8.7 |

SOURCES: IMF and Inter-American Development Bank.

On the basis of the difference between the total debits recorded by Spain and the credits of the recipient countries, and of the percentage of total emigrants from these countries residing in Spain, a measure was obtained of the degree of underestimation of the Spanish Balance of Payments figures, which might stand between 15% and 20%. Table A1 of Annex A details these differences for some of the main recipient countries of remittances sent from Spain.

Remittances and transfers abroad through Money Transfer Operators (remittance companies)

Before the April 2006 revision, the Spanish Balance of Payments figures were very similar to those reported by remittance companies in respect of their transfers abroad: 3,481 million euro and 3,424 million euro in 2004, respectively. Bearing in mind that immigrants claimed to make 80% of their total remittances through these remittance companies[10], a degree of underestimation of debits recorded in the Balance of Payments of the order of 20% might be inferred, a percentage similar to that obtained from the comparison with the credits published by the main counterpart countries.

The data from these establishments offer valuable information on the countries that receive the remittances sent, which does not match that provided by the geographical breakdown of the data that were included in the Balance of Payments. Table 3 shows the amount of transfers

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**10.** Evidence in this connection is provided by the study by CECA (Spanish Savings Bank Confederation) on remittances sent by Latin American emigrants resident in Spain to their home countries.

COMPARISON OF GEOGRAPHICAL BREAKDOWN IN BALANCE OF PAYMENTS
AND REMITTANCES COMPANIES  (a)

TABLE 3

Millions of euro, %

| | Rem. companies | BP | % Rem. Companies | % BP |
|---|---|---|---|---|
| % of total | - | - | 76.8 | 90.2 |
| Argentina | 46.2 | 13.6 | 1.4 | 0.4 |
| Bolivia | 187.3 | 177.6 | 5.5 | 5.1 |
| Brazil | 153.7 | 10.5 | 4.5 | 0.3 |
| Colombia | 729.6 | 766.8 | 21.3 | 22.0 |
| Ecuador | 770.2 | 664.2 | 22.5 | 19.1 |
| Peru | 81.9 | 87.6 | 2.4 | 2.5 |
| Dominican Republic | 165.3 | 86.7 | 4.8 | 2.5 |
| Philippines | 75.6 | 55.9 | 2.2 | 1.6 |
| Morocco | 210.7 | 75.6 | 6.2 | 2.2 |
| United States | 4.8 | 1,160.4 | 0.1 | 33.3 |
| Romania | 192.5 | 38.2 | 5.6 | 1.1 |
| Bulgaria | 12.8 | 3.9 | 0.4 | 0.1 |

SOURCE: Banco de España. Data prior to the April 2006 revision of remittance debits figures.

a. Absolute figures per country (millions of euros) and percentage of world total.

sent to the main counterpart countries according to the foregoing sources for 2004 (Table A2 in Annex A includes the data for 2003).

One notable feature of this comparison is that while the sending of remittances to the United States accounted for a very significant proportion of total debits in the Balance of Payments (33.3%), their weight in the total transfers by remittance companies was negligible (0.14%). Conversely, for the Latin American and Eastern European countries the figures in the Balance of Payments were, in most cases, lower than those relating to the remittance companies. These differences highlight the different geographical allocation criterion used respectively in the Balance of Payments and remittance company figures. The fact that the Balance of Payments should use the information on the related payments between residents and non-residents made through Spanish banks (ITRS figures) meant that in some cases their reported geographical distribution did not properly reflect the country that was the final destination of the funds. This occurs when intermediaries resident in third countries intervene in the settlement of the transactions, a particularly significant aspect in the case of remittances routed via agents of the major international money-transfer networks. In these cases, the transfers through which the remittance companies settle their transactions go to the head offices of these networks, often resident in the United States, and not the final recipients of the remittances. This would explain the overestimation of the weight of remittances sent to the United States according to the Balance of Payments figures, before they were revised, which was offset by smaller amounts for the other destinations.

To illustrate this point, Table 4 shows the growth rates of Balance of Payments remittances, before the April 2006 revision, and of the foreign population stock in Spain in the case of the EU, the United States and Latin America. As can be seen, except for 1998, 2002 and 2004[11], remittances sent to EU countries posted negative growth rates, while the foreign population stock grew at an average rate of 10.6%. In the case of the United States, although the US foreign population stock grew at a lower rate than that of the EU countries, remittances did so at much higher rates (30.9% on average for the period considered). Finally, high growth rates

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**11.** In 2002, an exceptionally high figure for remittance debits was recorded in the case of Germany.

| % | EU | | United States | | Latin America | |
|---|---|---|---|---|---|---|
| | Remittance | Population | Remittance | Population | Remittance | Population |
| | 16.2 | 10.6 | 30.9 | 3.2 | 45.3 | 32.4 |
| 1994 | -12.1 | 9.2 | 37.1 | 1.4 | 13.1 | 7.7 |
| 1995 | -7.6 | 6.7 | 56.9 | 2.5 | -13.0 | 6.0 |
| 1996 | -9.0 | 11.0 | 46.6 | -7.6 | -13.8 | 5.0 |
| 1997 | -12.6 | -2.9 | 18.7 | -20.4 | 122.6 | 14.8 |
| 1998 | 28.0 | 12.6 | 15.5 | 16.6 | 58.9 | 10.9 |
| 1999 | -3.3 | 20.4 | 50.6 | 12.8 | 74.5 | 11.9 |
| 2000 | -0.4 | 8.5 | 74.1 | 9.1 | 66.2 | 36.3 |
| 2001 | -31.7 | 10.0 | 25.9 | 11.1 | 87.8 | 123.6 |
| 2002 | 203.1 | 15.9 | -27.6 | 14.3 | 62.7 | 77.4 |
| 2003 | -50.2 | 18.2 | 25.6 | 17.3 | 30.0 | 43.4 |
| 2004 | 73.9 | 7.3 | 16.8 | -22.4 | 9.0 | 20.5 |

SOURCES: Banco de España and INE. Data prior to the April 2006 revision of remittance debits figures.

were recorded in the case of Latin America both for remittances and for the foreign population stock, especially in the period 1997-2003.

The basic conclusion of this analysis is that the high growth rates of remittances to the United States did not match the growth rates of the foreign resident population in Spain of US nationals. As earlier indicated, this distortion is due to the fact that, in many cases, the Balance of Payments would assign transactions to the country of residence of the intermediary through which the funds were routed and not to the final destination of the remittances.

CALCULATION PROCEDURES FOR REMITTANCE DEBITS IN THE SPANISH BALANCE OF PAYMENTS: LIMITATIONS OF THE REPORTING SYSTEM

The analysis set out in the foregoing paragraphs highlights the limitations of the reporting system used, until the April 2006 revision, for estimating remittances in the Spanish Balance of Payments. As indicated, this system was essentially based on the ITRS figures, mainly payments made via Spanish resident banks. The first of these limitations, and probably the most important one in view of the correct measurement of remittances, is the existence of high minimum thresholds for the reporting of individual transactions (€12,500 since January 2001 and €3,005 before then). These thresholds particularly affect the Workers' remittances heading owing to the habitually small amounts characterising the transactions made in this connection[12]. In addition, regard should also be had to the influence exerted by the frequent use of alternative systems to deposit institutions, such as remittance companies or informal channels (direct delivery of banknotes, remittances in kind, etc.), to route remittances. In Spain's case, this influence is by no means negligible, given the low degree of financial integration that is still the case for immigrants. The use of these alternative systems affected the Balance of Payments figures in a different way.

As regards the use of remittance companies, their transactions were indeed captured indirectly by the reporting system, since these establishments periodically settle with their corre-

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**12.** Reporting institutions communicate the total of the amount of transactions below the threshold, without specifying in which connection they are made. The distribution of these below-threshold amounts among the different Balance of Payments headings is estimated taking into account, as the main indicator, that relating to transactions of immediately higher amounts. This distribution system significantly affects remittance credits.

spondents, or with the clearing centres of the international money-transfer networks, the remittances that they channel. Such settlement, in which resident banks normally intervene, is recorded in the ITRS in net terms[13], albeit with the aforementioned problems regarding geographical allocation. Conversely, in the case of remittances sent through informal channels, no estimation as to their amount is currently available[14].

Finally, the possibility should be highlighted that, even if all transactions with non-residents (residents) conducted by an immigrant (emigrant) were recorded, it would be difficult to ensure that these had been correctly allocated to the various Balance of Payments headings[15]. This essentially affects the headings Workers' remittances, Compensation of employees, Capital transfers and Other current transfers.

In sum, the presence of high reporting thresholds and the routing of transactions through remittance companies and informal channels entails a weakening of the relationship between remittance debits and their demographic, economic and financial determinants; accordingly, while hampering their detection by the reporting system used by the Spanish Balance of Payments, this bears on the geographical allocation of remittance debits (see section 3.2.3 above) and on the incorrect recording of these transactions[16]. Thus, bearing in mind the direction and intensity of the migratory movements in Spain in recent years, the need to revise the procedure for calculating debits under this heading became patent.

*Estimation of potential*
*remittances sent abroad*

In order to quantify the underestimation of Balance of Payments remittance debits, the maximum flow of remittances that foreign workers resident in Spain could send to their home countries was first estimated, as described in this section. Hereafter, this estimation is called "potential remittances". Potential remittances are defined as the income available to immigrants once current expenditure and social security contributions have been deducted[17]. To calculate total potential remittances, regard is had fundamentally to changes in the foreign population in Spain[18] and its characteristics, using as basic information sources the new EPA 2005, and data from the Household Expenditure Survey and from the Quarterly Labour Costs Survey. Chart 5 shows, for the period 1996-2004, changes in Balance of Payments remittance debits and those in estimated potential remittances. As can be seen, and except for 1996 and 1997, potential remittances exceed debits. Further, this difference increases progressively over the years coinciding with the increase in the immigrant population. In particular, for 2004, an estimation of potential remittances of €8,710 million is obtained, compared with €3,481 million

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13. The ITRS figures collect the net amount of transfers issued and received, although the amount of the latter is small in Spain's case.   14. According to Puri and Ritzema (1999), for certain Asian and African countries, and in relation to different periods in the 80s and early 90s, the routing of remittances through informal channels would account for between 10% and 55% of the total sent. In a more recent paper, Freund and Spatafora (2005), using a model estimated for the period 1995-2003 and for a group of 104 countries, estimate that remittances sent through informal channels account for between 35% and 75% of total remittances sent to developing countries. Moreover, in keeping with the evidence shown by surveys conducted in some developing countries, significant differences between regions are observed regarding the proportion of informal remittances to total remittances. Specifically, it seems that the significance of remittances through informal channels is greater in the case of sub-Saharan Africa, Eastern Europe and Central Asia, with such remittances proving less substantial in the case of Latin America and the Caribbean, and East Asia.   15. For example, transactions that should be recorded as Other current transfers might be being recorded under Workers' remittances. This might be the case for pensions received by Spanish retirees resident in Latin America from the Spanish Social Security system.   16. In principle, it is to be expected that while the effect of transfers by remittance companies would be more significant in the case of immigrants from countries at a greater distance in miles from Spain, the resort to unofficial channels would be greater in the case of immigrants from countries geographically closer to Spain.   17. The basic outline of the exercise for estimating potential remittances is included in *The Spanish Balance of Payments and International Investment Position, Banco de España (2003)*.   18. This exercise for calculating potential remittances considered the population classified as foreign in the EPA, excluding the population with dual nationality. One problem with the classification of dual nationality is the absence of a breakdown by geographical area. In another exercise not included in the article, individuals with dual nationality were considered, being assigned by area on the basis of their distribution for the group of foreigners. The results of this exercise in terms of the trend of potential remittances were similar to those set out in this article, with estimated potential remittances somewhat higher than those obtained considering only the group of foreigners.

RECORDED REMITTANCES AND POTENTIAL REMITTANCES

CHART 5
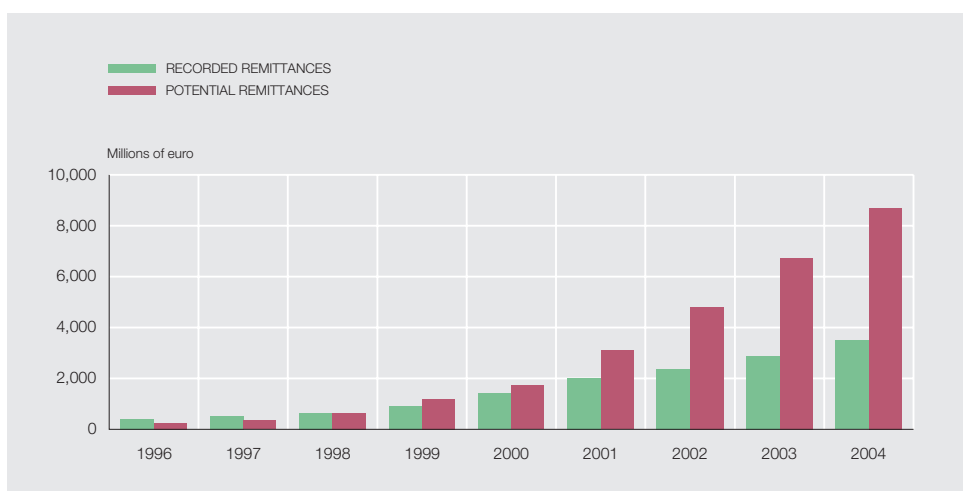


- RECORDED REMITTANCES
- POTENTIAL REMITTANCES

Millions of euro

SOURCE: Banco de España. Data prior to the April 2006 revision of remittance debits figures.

COMPARISON OF RECORDED REMITTANCES AND POTENTIAL REMITTANCES
IN THE BALANCE OF PAYMENTS

TABLE 5

Millions of euro, %

|  | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| Potential EPA 2005 | 246 | 348 | 656 | 1,199 | 1,729 | 3,096 | 4,807 | 6,742 | 8,710 |
| Potential Municipal Census | 168 | 331 | 690 | 1,041 | 1,215 | 2,467 | 3,993 | 6,173 | 7,376 |
| Potential 2001 Census | - | - | - | - | - | 2,913 | - | - | - |
| BP Remittances | 421 | 520 | 634 | 910 | 1,446 | 2,019 | 2,371 | 2,895 | 3,481 |
| % underestimation in BP in relation to: |  |  |  |  |  |  |  |  |  |
| Potential EPA 2005 | -0.7 | -0.7 | 3.3 | 24.1 | 16.4 | 34.8 | 50.7 | 57.1 | 60.0 |
| Potential Municipal Census | -0.6 | -0.4 | 8.1 | 12.6 | -19.0 | 18.1 | 40.6 | 53.1 | 52.8 |

SOURCES: Banco de España and INE. Data prior to the April 2006 revision of remittance debits figures.

of remittances recorded in the Balance of Payments. These data would indicate that immigrants were, on average and from 2001 to 2004, transferring 49% of the maximum amount (potential remittance) that they could send to their home countries. This percentage fell to 40% in 2004.

Table 5 compares the estimation of potential remittances obtained from the information provided by the EPA with that stemming from the use of the foreign population figures provided by the aforementioned alternative information sources (Census, Municipal Census[19] and DGP figures on foreigners). Although the figures for potential remittances obtained from the Municipal Census show the same trend as those of the EPA, the estimated level of potential remittances for each year is somewhat lower[20]. Note that the potential remittance estimated using the 2001 Census gives a closer value to the remittance estimated using the EPA 2005 than to the potential remittance estimated using the Municipal Census.

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**19.** In the case of the Municipal Census, the employed population figures would be obtained by applying the participation and unemployment rates calculated using the new EPA. **20.** The greater potential remittance obtained using the population data from the EPA rather than from the Municipal Census is a result of the bigger employed foreign population/total foreign population ratio obtained using the EPA instead of the Municipal Census.

Although the analysis of potential remittances provides the maximum theoretical amount that such transactions could reach, as well as an indication of the underestimation of debits in the Balance of Payments heading Workers' remittances, this exercise does not allow the true degree of this underestimation to be quantified. To do this it would be necessary to know the propensity of each group to send remittances, and this information is not currently available in Spain.

*Estimation of an equation for actual remittances sent from Spain*

In order to obtain an accurate measure of the degree of underestimation, a panel data econometric model was estimated for the variable of remittances sent from Spain to other countries on the basis of the variables which, according to the literature on remittances, are their main determinants [World Bank (2005), Bougha-Hagbe (2004), Brown (1997), Chami, Fullenkamp and Jahjah (2003), El-Sakka and McNabb (1999), Solimano (2003) and Whaba (1991)]. One significant difference between this exercise and the papers mentioned is that the dependent variable is not defined in terms of the remittance credits of the recipient countries, but in terms of the remittances sent from the issuer country (in our case Spain)[21]. The primary aim of the exercise is to establish what the fundamental determinants are of remittances to the different countries. The second aim is to use the model, devised with data from the period 1993-2000, to make projections of the remittances figure during the period 2001-2004[22]. The basic equation considered is defined by[23]:

$$r_{it} = \alpha_i + \beta'z_{it} + v_{it} \quad i = 1, \ldots, N; t = 1, \ldots, T \tag{1}$$

where rit denotes the logarithm of the remittance debits[24] recorded in the Spanish Balance of Payments in year t made by immigrants from counterpart country i, $\alpha_i$ is a specific effect relating to country i and $z_{it}$ is a vector of explanatory variables.

As regards the selection of the model's explanatory variables, the guidelines of the literature on remittances that analyses the fundamental determinants for the sending of these transfers[25] have been followed. An initial approach in this literature establishes that remittances sent by immigrants are in response to altruistic motives. Under this approach, remittances reflect the immigrants' concern for the welfare of their family in the country of origin. Altruistic motivation has been considered as a determinant of the so-called fixed remittances (a minimum amount that immigrants send to their family to meet their basic needs). As explanatory variables related to this altruistic motivation, the literature mentions the economic situation in the immigrants' home country, the income differential between the home and host countries, and demographic variables, such as the foreign population stock and the average time that the immigrant has been in the country of residence. Regarding this latter variable, one of the predictions of the altruistic approach is that the remittances sent to the home country will diminish as the time that immigrants stay in their new country of residence increases and the ties to the country of

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**21.** One exception would be the paper by Faini (1994), which analyses the determinants of remittance payments by various groups of immigrants resident in Germany. In the literature on remittances, the dependent variable is often defined by the proportion accounted for by remittance credits in each country's GDP. Along these lines, in a specification not included in the text, the percentage accounted for by remittance payments from Spain in each country's GDP was considered as a dependent variable. **22.** The choice of estimation period was in response both to the fact that the minimum reporting threshold for foreign proceeds and payments transactions was raised (in January 2001), with a subsequent loss of information deriving therefrom, and to the fact that from 2001 the correlation between the Balance of Payments data obtained from the habitual calculation procedure and those derived on the basis of the characteristics of the immigrant population lessened. **23.** The estimated equation can be deduced from a specification for total remittances sent that is defined by: Total remittances=Average remittance sent by immigrant * Number of immigrants. Taking logarithms in the specification and formulating a model for the average remittance per immigrant in terms of explanatory variables and of specific country effects gives equation (1). **24.** Remittance debits in euro deflated using the base 1992 Consumer Price Index (CPI) are considered. **25.** Another important branch of the literature on remittances analyses the effects that remittances have on the economy of the recipient country. It highlights the role played by these funds in supplementing national saving and as a source of external financing.

origin weaken. In an attempt to capture the altruistic motive, the model considers as explanatory variables the logarithm of the ratio of Spanish per capita GDP to that of the country of origin (adjusted by each currency's purchasing power parity), the growth rate of GDP in the immigrant's home country and the average duration of stay in Spain, all such variables being for immigrants from different geographical areas[26].

A second approach of the literature analyses remittances from the perspective of the family [Lucas and Stark (1985)]. Here, remittances are in response to an implicit contract between the immigrant and the family that stays in the country of origin. The contract may have an intertemporal perspective and investment and compensation components. The investment component refers to the fact that the family decides to meet the costs of the immigrant's education and, in some cases, to finance the cost of the change of residence (transport costs and initial subsistence costs in the host country). The compensation component is defined by the remittances that the immigrant sends once he/she is established in the host country as compensation for the investment made earlier by his/her family.

A variation on this theme of the implicit contract described in the previous paragraph refers to the concept of risk diversification. Under the assumption that economic risk in the home and host countries is negatively correlated, and assuming the existence of incomplete financial markets and liquidity constraints in the immigrant's home country, a risk diversification strategy for the family consists of promoting the emigration of one of its members. Under this approach, the immigrant can finance the family at times of economic crisis in the immigrant's home country. Likewise, the fact that the family remains in the home country is an insurance policy for the immigrant at times of economic crisis in the host country. This motivation behind the sending of remittances is included in the equation through the variables that reflect both the altruistic and the investment approaches.

Finally, another approach in the theory of remittances establishes that they are due to an economic or investment concern on the part of the immigrant (portfolio approach). Under this approach, the immigrant saves and sets aside a proportion of saving to invest in the home country (Faini (1994), Glytsos (1988) and Straubbar (1986)). In making this investment decision the immigrant takes into account the interest-rate differential and the expectations regarding future movements in the exchange rate[27]. The explanatory variables relating to the investment motive that are considered are the interest-rate differential between the immigrant's home country and Spain and the logarithm of the exchange rate of the home country's currency against the euro[28]. Regarding the interest-rate differential, the theory predicts that the remittances sent will be bigger the greater the interest-rate differential between deposits in the currency of the country to which the funds are sent and deposits in the currency of the immigrant's host country. As to the exchange rate variable, the theory's prediction is ambiguous since the total effect of a depreciation of the immigrant's home country's currency is the sum of a substitution effect and of an income effect. On one hand, there is a negative substitution effect induced by the fact that, with the depreciation, goods in the immigrant's home country are cheaper, expressed in the currency of his/her new country of residence and, therefore, he/she needs to transfer less income to finance the purchase of a given quantity of goods in the home country. On the other, there is a positive income effect arising from the fact that, with a depreciation, the immigrant's purchasing power, measured in the currency of his home

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26. Annex B includes a full description of the variables and data sources used.   27. The exchange rate is a variable that is also related to the altruistic motive owing to its effect on the purchasing power of the recipient of the remittance expressed in the currency of the country in which the immigrant resides.   28. Given the characteristics of the immigrant population in Spain, it is to be assumed that investment-motive remittances are sent essentially to their respective home countries.

country, is greater, meaning that the remittance sent increases. Finally, a variable of the business cycle in the emigrant's country of residence, which is defined by the growth rate of GDP in Spain[29], is considered as an explanatory variable.

A key feature of the findings of the exercise, in the different models estimated, and in relation to the predictions of the theory of remittances, is that while the variables related to income differences between countries and demographic variables have, in general, turned out to be significant in the estimates for developing countries, the financial variables relating to the investment motive turned out to be negligible or insignificant for these countries; however, on occasions they were actually significant in the estimates obtained for the developed countries.

The estimation was made separately for three groups of countries: a) Latin American, African and Asian countries, b) Eastern European countries and c) EU countries and the United States[30]. The countries selected cover a significant proportion of the total remittance payments from Spain, during the period considered[31]. The separate estimation by group of countries is in response to the fact that the motivations for sending remittances may differ between immigrants from different geographical areas. In particular, bearing in mind the income differences between Spain and some Latin American, African and Asian countries, the altruistic and contractual motives will conceivably be important when explaining the remittances sent by immigrants from these countries. Conversely, in the case of foreigners from EU countries and the United States, the investment motive may be more important than the altruistic motive.

A summary description follows of the key results of the estimation of different specifications of the immigrants' remittances equation (model 1, model 2, model 3 and model 4).

The following table shows two alternative estimations of the remittances equation for the group of Latin American, African and Asian countries for the 1993-2000 period (model 1). As earlier indicated, the period considered for estimating the model does not run beyond 2000 for two reasons. The first is the raising of the minimum reporting threshold for individual transactions in 2001, and the second the lesser correlation between the Balance of Payments data on remittance debits obtained using the habitual procedure and the characteristics of the immigrant population in Spain as from that year. The second column contains ordinary least squares (OLS) estimations of the remittances equation, including the aforementioned main explanatory variables of remittances.

In general, the OLS estimations present the expected signs with a greater level of significance of the variables related to the altruistic motive. The remittances sent to other countries depend positively on the logarithm of the foreign population stock (Imigrant), on the difference in GDP per

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**29.** Other variables considered in the estimations are the inflation rate in the immigrant's country of origin, the female participation rate in the country of origin, the local currency/euro real exchange rate and a political freedom index. While the first three variables proved relatively insignificant, the political freedom index was in fact significant and with a negative sign. This result was different from what was expected. All the indications are that the variable considered is not properly capturing the event it is sought to reflect. Accordingly, and given that the predictive results of the model do not change to any great extent when this variable is included, it is deemed preferable to set out the results of the estimation without including it and to undertake a more detailed analysis of the matter in the future.   **30.** Latin America (Argentina, Bolivia, Colombia, Ecuador, Brazil, Mexico, Peru, Dominican Republic and Venezuela), Africa and Asia (Morocco and the Philippines), the United States, the EU 15 (Germany, Portugal, United Kingdom and France) and Eastern Europe (Romania, Poland, Bulgaria and Russia).   **31.** Specifically, the remittance debits recorded in the Balance of Payments, those intended for the countries considered in the estimation, account for 73.9% of debits in 1993 and 95% in 2004. As to the percentage accounted for by the population of these countries in the total foreign population stock, Municipal Census figures show that the population of these countries represented 61.4% of the total population in 2003 and 74.4% in 2004.

**ESTIMATION MODEL 1, PERIOD 1993-2000** (a)                                         TABLE 6

| VARIABLE | OLS | t-ratio | OLS with country effects | t-ratio |
|---|---|---|---|---|
| lmigrant | 0.548 | 4.52 | 1.594 | 9.18 |
| lgdpratio | 1.058 | 3.15 | - | - |
| gdpspain | 0.161 | 2.64 | 0.136 | 2.73 |
| gdphome | -0.017 | -0.66 | -0.033 | -1.49 |
| stay | -0.724 | -3.15 | - | - |
| intspread | 0.000 | -0.14 | - | - |
| lcurrency | 0.021 | 0.47 | -0.611 | -3.44 |
| R2 | 0.687 | | 0.994 | |

SOURCE: Banco de España.

a. The fourth column includes OLS estimates with country effects (0-1 dummy variables for each country) interacting with the logarithm variable of the population stock. The dependent variable is the logarithm of real remittance debits. The variable lmigrant denotes the logarithm of the foreign population stock, the variable lgdpratio denotes the logarithm of the ratio of Spanish per capita GDP to that of the immigrant's home country (with a PPP adjustment), the variables gdpspain and gdphome denote the real growth rates of GDP in Spain and in the immigrant's home country. The variable stay is the average time the immigrant stays in the host country. The variable intspread is the nominal interest rate differential between the home country and Spain, and lcurrency denotes the logarithm of the home-country currency/euro exchange rate. The variable lmigrant in the second column refers to the interaction between the foreign population stock and a 0-1 dummy variable for Ecuador.

capita between Spain and the immigrant's home country (lgdpratio) and on the growth rate of Spanish GDP (gdpspain), albeit with a lower level of significance for the latter. However, there is negative dependence regarding the average stay by the immigrant (stay). The explanatory variables related to remittances responding to the investment motive are not statistically significant.

A problem that may affect the OLS estimation is the assumption that there is no heterogeneity between countries, either in the average of the equation or on the effect of specific explanatory variables on remittances sent. For example, it is assumed that the marginal effect of an increase in the number of immigrants of a specific nationality on remittances sent is the same irrespective of the nationality in question. In practice, it is to be expected that these effects will change significantly from one nationality to another, owing for instance to human capital differences among the immigrants arriving in Spain. To control for this, consideration has been given to an alternative specification which introduces interactions between the logarithm of the foreign population stock and 0-1 dummy variables for each country considered in the estimation[32]. The fourth column of Table 6 shows the results of this estimation[33]. It can be seen that the explanatory power of the equation (measured by the R2 ratio of the model) increases by means of the inclusion of the aforementioned interactions. The remittances sent depend positively on the foreign population stock (lmigrant), on the Spanish GDP growth rate (gdpspain) and, negatively, on the local currency/euro exchange rate (lcurrency). Moreover, the growth rate of GDP in the immigrant's home country[34] (gdphome), which was not previously signifi-

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**32.** For a treatment of the estimation of the panel data models with fixed effects, see Arellano (2003) and Hausman and Taylor (1981).   **33.** Table 6 only shows the final specification with the significant variables which will be used subsequently in the forecasting exercise. In practice, other alternative specifications were also considered. An initial specification included 0-1 dummy variables for each country in the remittances equation, although the fit of the model was inferior. A second specification included a lag of the dependent variable in the model. The lag proved significant, capturing part of the effect of the foreign population stock which was also a significant variable. The predictions of this specification did not change appreciably from that which was finally considered.   **34.** Some studies mention the possibility of the GDP growth rate in the immigrant's home country being an endogenous variable. A Hausman exogeneity test, which compares the estimation made with an estimation of instrumental variables (using a lag of the GDP growth rate as an instrument), does not reject the hypothesis of exogeneity of this variable. Specifically, the value of the statistical test is 1.09 for a JI-square with 14 degrees of freedom.
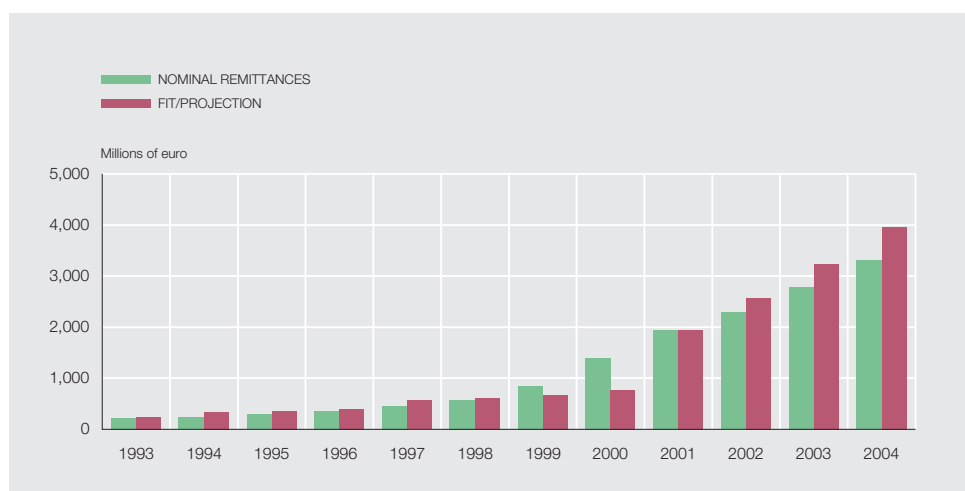
Millions of euro

NOMINAL REMITTANCES
FIT/PROJECTION

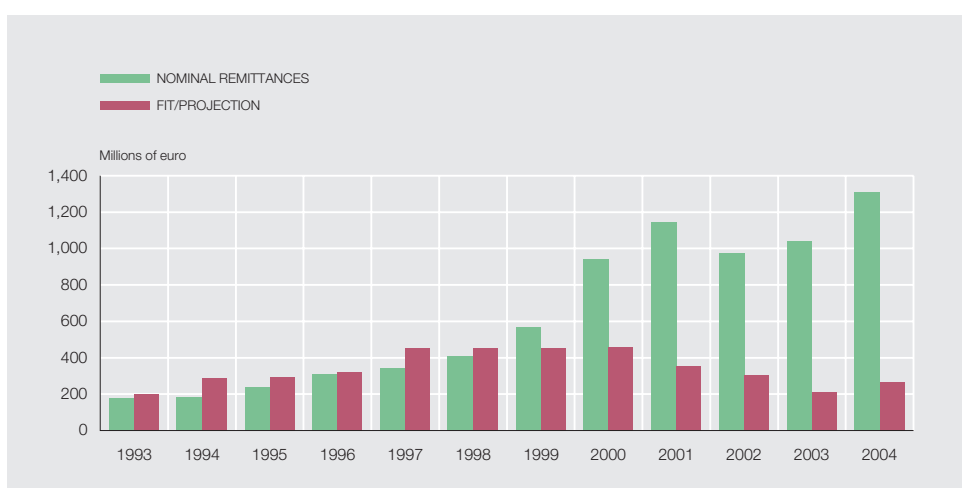SOURCE: Banco de España. Data prior to the April 2006 revision of remittance debits figures.

cant, is now marginally so. The negative sign of this variable suggests that remittances sent increase when the growth rate of the foreign country is lower. Lastly, the coefficients relating to interactions of the population variable with country effects show some cross-country heterogeneity[35].

Along these same lines, an estimation (models 2 and 3 included in Annex D) has been made of the remittances equation for the group of countries of the EU and the United States, and for the group of Eastern European countries. In these areas, some of the variables lose their level of significance. In the case of the EU countries and the United States, there is a positive relationship between remittances sent and the interest rate differential between the home country and Spain. This effect might suggest an investment motive in the sending of remittances. In the case of the estimation for Eastern European countries there is a positive relationship between remittances sent and another two variables, the foreign population stock and the interest rate differential, while the variables proxying the altruistic effect did not only not prove significant but had, on occasions, a sign contrary to what the theory predicts. Behind this result might be a greater resort to unofficial channels for sending remittances than in other countries, aided by greater geographical proximity.

Chart 6 compares the Balance of Payments figure for nominal remittances for the three groups of countries considered as a whole, with the fit (for the period 1993-2000) and the projection (for the period 2001-2004) for the remittance debits obtained using the different models estimated by area. The models that finally appeared most suitable for obtaining the projections are those that include interactions of country effects and of the population variable, since they achieve a better fit of the remittances equation in the estimation period. In terms of the projection of the model for the period 2001-2004, the result is an average underestimation of debits of around 10% for this period.

It should be stressed that the coefficients estimated for the explanatory variables of the foregoing model might be affected by the fact that a significant portion of remittances is routed through remittance companies, whose settlement centres are resident in the United States.

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**35.** In particular, the countries with the highest coefficient for the logarithm variable of the population stock (greater elasticity of remittances sent to the foreign population stock) are Mexico (1.094), the Philippines (1.178), Colombia (1.327) and Ecuador (1.594), while those with a lower coefficient (less elasticity of remittances sent to the foreign population stock) are Morocco (0.874), Argentina (0.783) and Bolivia (0.778).

NOMINAL REMITTANCES

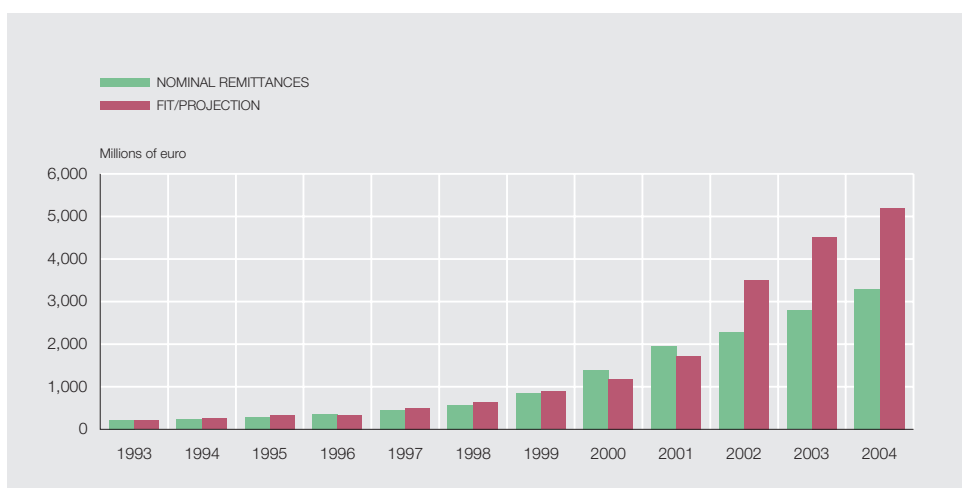FIT/PROJECTION

Millions of euro

SOURCE: Banco de España. Data prior to the April 2006 revision of remittance debits figures.

This flow of remittances, as discussed in section 3, was allocated to the United States as the counterpart country, although its final destination was other countries. The result was a debits figure recorded vis-à-vis the United States that was far higher than the prediction in the model, formulated on the basis of their demographic, economic and financial determinants. This is clearly reflected in Chart 7, which compares the remittances recorded and the projection of remittances in model 2 relating to the EU countries and the United States. As can be seen, the basic result is that the determinants of remittances in the developed countries predict far fewer remittances from Spain in the period 2001-2004.

So as to control the effects that the potential overvaluation of remittances to the United States recorded in the Balance of Payments may be introducing into the estimation, an alternative estimation exercise has been conducted. Given the characteristics of immigrants from the United States and their motives for sending remittances, it was considered a reasonable hypothesis that remittance payments to the United States should have followed a similar pattern to that of remittance payments made by residents from EU countries[36]. Thus, it was considered that remittance payments whose final destination was the United States grew, from 1993, at a similar rate to that of remittance payments whose final destination was the EU countries. The difference between remittance payments to the United States recorded in the Balance of Payments and payments calculated in accordance with this criterion was reallocated to the countries with more weight in terms of remittances made through remittance companies[37]. Once the reallocation was made, the models were estimated again for the different groups of countries and projections were calculated for the period 2001-2004 (model 4)[38]. The comparison of the fit/projection of the model and the total remittance recorded in the Balance of Payments is shown below (Chart 8).

An initial conclusion that may be drawn from the estimation of the models entailing reallocation of the figure for remittances sent to the United States is that their fit, in the estimation period

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**36.** Another alternative hypothesis involved applying the growth rates of the US foreign population stock to the pattern of remittances. The results would suggest an average underestimation that was somewhat greater in total debits for the period 2001-2004 (approximately 31%).    **37.** In this connection, regard is had to the percentage accounted for by each country in transfers made through remittance companies in the period 2002-2003.    **38.** Estimates for this model and the group of Latin American, African and Asian countries are included in Table D3 (Annex D).

NOMINAL REMITTANCES
FIT/PROJECTION

Millions of euro



SOURCE: Banco de España. Data prior to the April 2006 revision of remittance debits figures.

1993-2000, improves in relation to the fit of models without any reallocation[39]. Moreover, the projections of remittance debits suggest the existence of an average underestimation of 25% in the figure recorded for debits for the period 2001-2004. Therefore, the underestimation obtained for the model with reallocation of the debits figure to the United States, in the period 2002-2004, is higher than that of the model without reallocation. In order to compare statistically the projections resulting from the estimation of the models with reallocation of the US debits figure and without reallocation, Table 7 shows the 95% confidence intervals for the projections obtained with both models.

As can be seen in the table, the projections obtained from the models with no reallocation of the US debits figure are lower than the projections of the model with reallocation. Nonetheless, in each year a significant portion of the values in the intervals estimated in the first case is within the confidence intervals defined for the model with reallocation[40].

In sum, econometric model 4 reallocates a high proportion of the remittances sent from Spain to the United States according to the Balance of Payments to their final destinations, in accordance with the information provided by currency-exchange bureaux and with the pattern of remittances sent by immigrants from the EU, with similar characteristics to the immigrants whose home country is the United States. And it is this model which has the best fit in the estimation period 1993-2000. The projections obtained with this model for remittance payments sent from Spain in the period 2001-2004 point to an underestimation in the Spanish Balance of Payments data, prior to their revision, of close to 25%.

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**39.** As an adjustment measure, the mean of the squared differences can be compared between the values of the adjusted remittance and the recorded remittance using the models estimated for the period 1993-2000. The value of this statistic for the estimation of the models without reallocation of the figure of payments to the United States is 15.076, while the value of the statistic for the estimation of the models with reallocation of the figure of payments to the United States is 4.272.   **40.** As an alternative to the reallocation of the figure for remittance debits to the United States in the Balance of Payments, consideration was also given to the possibility of including as explanatory variables in the equation of remittances sent to the United States the foreign population stock of countries that use remittance companies, the average GDP growth rate of those countries and variables relative to the United States. As a result of the estimation, a positive relationship was identified between the remittances sent to the United States and the foreign population stock of the countries that send remittances via that country, with a low level of significance of the other explanatory variables associated with these countries. The model thus estimated suggests the existence of an average underestimation of close to 29% for the period 2001-2004. However, the projection of the figure for remittances sent via the United States for this period (and the projection of total remittances sent) will be biased upwards if the effect of the foreign population stock of the countries considered diminishes over time as the process of integration of this group of immigrants increases.

| | Model without reallocation of US figure | | | Model with reallocation of US figure | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Lower value | Central value | Upper value | Lower value | Central value | Upper value |
| 2001 | 1,616.1 | 1,943.7 | 2,271.4 | 1,518.1 | 1,763.8 | 1,935.6 |
| 2002 | 1,949.2 | 2,578.0 | 3,206.8 | 2,829.3 | 3,512.2 | 4,197.1 |
| 2003 | 2,290.5 | 3,234.4 | 4,178.3 | 3,505.2 | 4,519.3 | 5,533.4 |
| 2004 | 2,819.8 | 3,961.1 | 5,102.4 | 3,965.5 | 5,196.2 | 6,426.8 |

SOURCE: Banco de España.

*Conclusions*

The scale of migrant inflows into Spain in recent years and the evidence that such immigration was not being reflected in all its intensity in the Balance of Payments data has made it necessary to determine the possible biases in the figures included in this statistic, using methods other than the reporting system previously employed to calculate them.

This article describes the limitations to the data estimations of Workers' remittances in the Spanish Balance of Payments when they were estimated using exclusively the information from the ITRS figures. The pattern of remittances in Spain, according to Balance of Payments data, and that of their main determinants highlighted some overstatement of debits and a potential understatement of credits. The notable growth of migrant inflows into Spain in recent years has advised focusing work on the debits under this heading.

Accordingly, an estimation has been made both of the maximum remittances that immigrants resident in Spain might send to their home countries (potential remittances), and of remittances actually sent, bearing in mind the variables which -according to the literature on remittances- determine these flows. To do so, a panel data econometric model was estimated considering different geographical areas, with the aim of taking into account the different characteristics of immigrant groups. The result of this exercise was an average underestimation of remittance debits for the period 2001-2004 of around 25%. This result is consistent with that obtained from the comparison of Spanish Balance of Payments data with other available sources (data on transfers via remittance companies, data on the debits of the counterpart countries, etc.), from which an underestimation of close to 20% was inferred.

On the basis of the results of the exercise described in this article, and coinciding with the annual revision of the Spanish Balance of Payments data which, like every year, was conducted in April in 2006 when the initial data for January of the current year were released, the data on debits under the Workers' remittances heading were revised. In addition to bearing on the data for 2005, which were closed for the first time, this revision affected those relating to the period between 2001 and 2004. The revision has translated into an increase in debits of around 20% in relation to the previous figures. Furthermore, the allocation of these payments to their end-countries has improved, using information provided to the Banco de España by currency-exchange bureaux (remittance companies), which reflect the geographical breakdown of this variable more appropriately. The Balance of Payments department is continuing to work on a similar exercise for remittance credits, which offers evidence on their possible overestimation.

27.7.2006.

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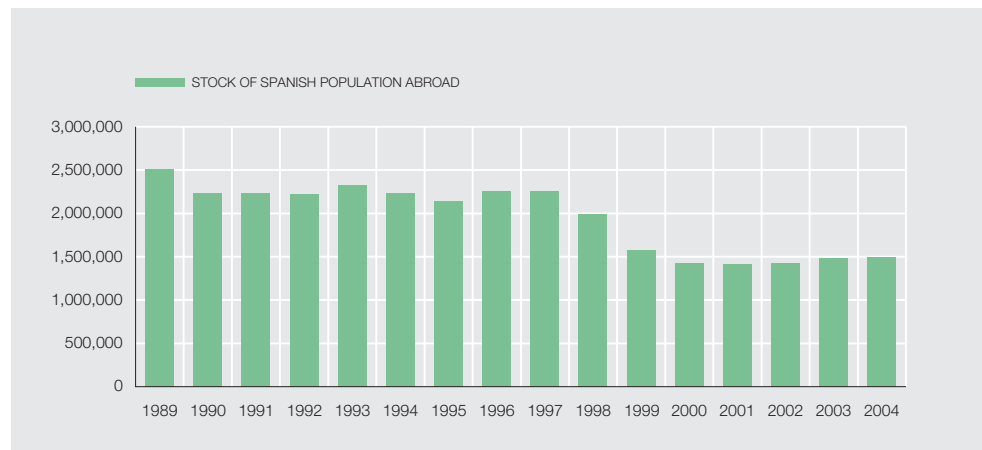
MIGRANT FLOWS OF SPANIARDS ABROAD

CHART A.1
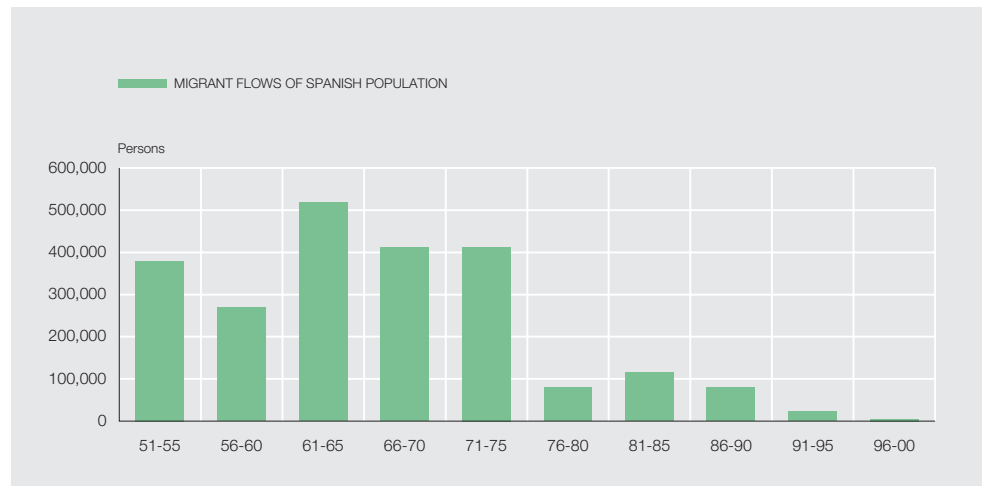


SOURCE: *Anuario de Migraciones,* Ministerio de Trabajo y Asuntos Sociales.

STOCK OF SPANISH POPULATION ABROAD

CHART A.2



SOURCE: Registration of residents at Spanish Consular Records.

**ESTIMATION OF REMITTANCE PAYMENTS IN SPAIN IN 2001** (a)

Millions of euro

| Country | Estimation of payments | Recorded remittances |
|---|---|---|
| Total | 2,219.4 | 1,891.7 |
| Colombia | 407.9 | 191.6 |
| Ecuador | 598.2 | 480.7 |
| Morocco | 730.9 | 9.8 |
| Romania | 120.0 | 0.3 |
| Dominican Republic | 108.9 | 17.0 |
| Brazil | 73.8 | 17.1 |
| Bolivia | 17.3 | 12.6 |
| Peru | 97.7 | 44.0 |
| Argentina | 55.8 | 2.0 |
| United States | 7.8 | 1,092.1 |
| Philippines | 1.1 | 24.5 |

SOURCES: IMF and OECD, Database on Foreign Born and Expatriates, 2005

a. To calculate the estimation of debits, an allocation of credits is made from the Workers' remittances heading of the Balance of Payments of the main recipient countries of funds sent from Spain, using the proportion of emigrants aged over 15 resident in Spain in relation to total residents in OECD countries. It has been assumed in this estimation exercise that all immigrants who send remittances to their home country do so for a similar amount, irrespective of the country in which they currently reside. That is to say, on average, an Ecuadorian immigrant sends to Ecuador the same amount irrespective of whether he resides and works in Germany or in Spain. Furthermore, it should not be forgotten that the different estimation methods and sources of information used by the different countries reduce the comparability of bilateral flows.


**GEOGRAPHICAL BREAKDOWN OF TRANSFERS IN 2003: INFORMATION**
**FROM THE BALANCE OF PAYMENTS AND REMITTANCE COMPANIES IN 2003** (a)

Millions of euro, %

| | Rem. Companies | BP | % Rem. Companies | % BP |
|---|---|---|---|---|
| % of world total | - | - | 77.0 | 94.5 |
| Argentina | 42.4 | 4.0 | 1.5 | 0.1 |
| Bolivia | 84.1 | 83.5 | 3.0 | 2.9 |
| Brazil | 93.6 | 3.2 | 3.3 | 0.1 |
| Colombia | 711.6 | 757.4 | 25.2 | 26.2 |
| Ecuador | 707.7 | 650.2 | 25.1 | 22.5 |
| Peru | 60.5 | 81.9 | 2.2 | 2.8 |
| Dominican Republic | 133.0 | 62.8 | 4.7 | 2.2 |
| Philippines | 33.5 | 32.2 | 1.2 | 1.1 |
| Morocco | 145.5 | 58.0 | 5.2 | 2.0 |
| United States | 15.5 | 993.9 | 0.6 | 34.3 |
| Romania | 135.7 | 5.3 | 4.8 | 0.2 |
| Bulgaria | 10.8 | 1.4 | 0.4 | 0.1 |

SOURCE: Banco de España. Data prior to the April 2006 revision of remittances debits figures.

a. Absolute figure (milions of euros) and percentage of world total.

This annex describes the variables used in the estimation and the data sources from which they are drawn.

1. Nominal remittance payments to the counterpart countries are obtained from the Spanish Balance of Payments for the period 1993-2004.

2. The consumer price index base 1992 used to deflate the variable of nominal remittance payments is obtained from INE (National Statistics Institute).

3. The data on PPP per capita GDP in dollars for Spain and the other countries are obtained from the September 2004 IMF World Economic Outlook database.

4. The growth rates of Spanish GDP and of GDP for the other countries at constant prices are obtained from the September 2004 IMF World Economic Outlook database. Specifically for Spain, the variable is defined as the growth rate of GDP at 1995 constant prices.

5. The exchange rate of the euro and the currencies of the other counterpart countries in relation to the dollar are obtained from the IFS (International Financial Statistics) database. The variable is defined as the annual average of exchange rates for each year of the period considered.

6. The interest rate differential is obtained as the short-term or deposits rate drawn from the IFS database.

7. The immigrant population in Spain variable is obtained by combining the data of the Municipal Census and the DGP figures for foreigners in Spain. For the period 1993-1995, the DGP data are taken. The data for 1996 and 1998 are obtained as averages of the Municipal Census and the DGP figures. For 1997, the 97/98 DGP growth rate is applied to the figure calculated for 1998. For the period 1999-2002, the Municipal Census data are used. There are countries for which the Municipal Census data are not available until 2001 (Ecuador, Colombia and Dominican Republic). In this case, a population figure is constructed by projecting backwards the Municipal Census 2001 population figure, using the growth rates of the DGP figure.

8. The variable of the average stay in Spain of the different groups of immigrants is constructed for different geographical areas using the information from the 2005 EPA (Labour Force Survey).

ANNEX C

*Model 1 with a dependent
variable defined as
Remittances per immigrant*

Estimation of the model with a dependent variable defined as the logarithm of remittance payments per immigrant. The following table shows the results of the estimation of a model with country effects in levels for the group of Latin American, African and Asian countries (model 1), including the most significant variables and the coefficients relating to the country effects in levels.

The result of the estimation shows that the remittance per immigrant depends positively on GDP growth in Spain and negatively on the average stay in Spain. The variable GDP growth in the home country has the expected sign but is not significant.

ESTIMATION MODEL 1. DEPENDENT VARIABLE: LOGARITHM
OF REMITTANCES PER IMMIGRANT, PERIOD 1993-2000

TABLE C.1

| VARIABLE | OLS effects in levels | t-ratio |
|---|---|---|
| gdpspain | 0.276 | 6.35 |
| gdphome | -0.028 | -1.33 |
| stay | -0.485 | -2.14 |
| Bolivia | -1.260 | -1.30 |
| Argentina | 1.092 | 1.13 |
| Ecuador | 1.922 | 1.99 |
| Philippines | 2.095 | 1.81 |
| Morocco | 1.221 | 1.05 |
| Brazil | 1.310 | 1.35 |
| Mexico | 1.102 | 1.14 |
| Peru | 0.772 | 0.80 |
| Colombia | 1.290 | 1.33 |
| Venezuela | 0.476 | 0.49 |
| Dominican Republic | 1.672 | 1.72 |
| R2 | 0.717 | |

SOURCE: Banco de España.

FIT AND PROJECTION OF MODEL 1

CHART C.1



NOMINAL REMITTANCES
FIT/PROJECTION
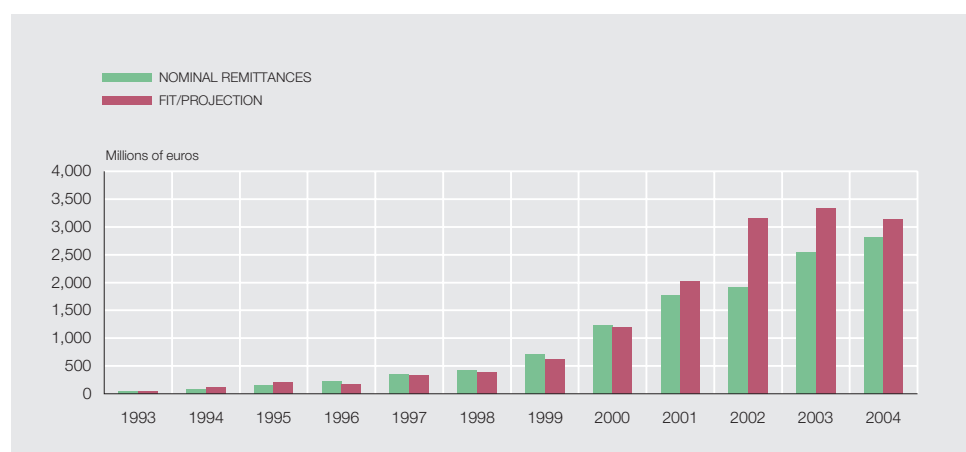
SOURCE: Banco de España.

The following chart compares the recorded remittance for model 1 with the prediction of the model when the reallocation of the US remittance is made. In each case the logarithm of the remittance per immigrant and specific country effects included in the average of the estimated equations is considered as a dependent variable.

The comparison of the recorded remittance and the predicted remittance using the model with reallocation for the period 2001-2004 reveals an average underestimation of approximately 21%.

**ANNEX D**
*Results of the estimation
of models 2, 3 and 4*

This annex includes tables with estimations relating to model 2 (the United States and countries of the EU area) model 3 (Eastern European countries) and model 4 (with reallocation of the United States remittance payments).

**ESTIMATION MODEL 2, PERIOD 1993-2000 (a)**   TABLE D.1

| VARIABLE | OLS | t-ratio | OLS with country effects | t-ratio |
|---|---|---|---|---|
| lmigrant | -2.319 | -5.83 | -0.765 | -2.52 |
| gdpspain | 0.272 | 2.37 | - | |
| lcurrency | -3.834 | -2.63 | - | |
| intspread | -1.640 | -2.41 | 0.080 | 3.17 |
| R2 | 0.586 | | 0.999 | |

SOURCE: Banco de España.

Note: OLS estimation with country effects denotes OLS estimation with individual country effects included in levels for the United States, Germany, Portugal, Italy and United Kingdom.

**ESTIMATION MODEL 3, PERIOD 1993-2000** (a)   TABLE D.2

| VARIABLE | OLS | t-ratio | OLS with country effects | t-ratio |
|---|---|---|---|---|
| lmigrant | 0.406 | 1.56 | 0.431 | 9.23 |
| lgdpratio | -3.541 | -3.42 | - | |
| intspread | 0.011 | 2.21 | 0.007 | 1.61 |
| lcurrency | 0.091 | 1.54 | - | |
| R2 | 0.846 | | 0.982 | |

SOURCE: Banco de España.

Note: OLS estimation with country effects denotes OLS estimation with individual country effects interacting with population for Romania, Bulgaria, Poland and Russia. The coefficient of the variable lmigrant corresponds to the interaction of the population with the variable (0-1) for Russia.

**ESTIMATION MODEL 4, GROUP OF LATIN AMERICAN, AFRICAN AND ASIAN COUNTRIES. PERIOD 1993-2000** (a)   TABLE D.3

| VARIABLE | OLS | t-ratio | OLS with country effects | t-ratio |
|---|---|---|---|---|
| lmigrant | 1.009 | 9.62 | 1.496 | 9.31 |
| lgdpratio | 0.365 | 1.26 | - | - |
| gdpspain | 0.267 | 5.07 | 0.302 | 6.55 |
| gdphome | -0.010 | -0.45 | -0.029 | -1.40 |
| stay | -0.318 | -1.60 | - | - |
| intspread | 0.000 | 0.00 | - | - |
| lcurrency | 0.021 | 0.52 | -0.514 | -3.13 |
| R2 | 0.785 | | 0.996 | |

SOURCE: Banco de España.

a. The fourth column includes OLS estimates with country effects (0-1 dummy variables for each country) interacting with the logarithm variable of the population stock. The dependent variable is the logarithm of real remittance debits with reallocation of remittance payments to the United States. The variable lmigrant denotes the logarithm of the foreign population stock, the variable lgdpratio denotes the logarithm of the ratio of Spanish per capita GDP to that of the immigrant's home country (with a PPP adjustment), the variables gdpspain and gdphome denote the real growth rates of GDP in Spain and in the immigrant's home country. The variable stay is the average time the immigrant stays in the host country. The variable intspread is the nominal interest rate differential between the home country and Spain, and lcurrency denotes the logarithm of the home-country currency/euro exchange rate. The variable lmigrant in the second column refers to the interaction between the foreign population stock and a 0-1 dummy variable for Ecuador.