LATIN AMERICAN REMITTANCES DEPENDENCE ON EXTERNAL SHOCKS
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Abstract: Remittances have become an important and reliable source of funds for many developing countries, particularly Latin American countries. The inflow of remittances has been shown to improve consumption levels, health care access, educational attainment, and the implementation of entrepreneurial initiatives, affecting the economic prospects of the receiving countries. However, economic conditions in the host-countries have proven to be influential in immigrants’ earnings and their ability to send money to their families back home. This article measures the impact that economic fluctuations in the U.S. and Spain have in the amount of remittances received by 5 Latin American countries, showing that migrant workers tend to send more funds home when the state of the economy in which they reside improves. Our results also show that shocks to specific sectors of the host country produce a differential effect on the remittances flowing to different countries, both in terms of magnitude and sometimes direction.

Keywords: Remittances; Migration; Latin America; Economic Fluctuations; International Business Cycles.

JEL Classification: F24; F22; N16; F62; F44

1.- Introduction
The recent behavior of immigrant’s remittances has changed the way in which we account for the economic performance of the country where immigrants reside in the determination of these capital flows. The traditional view postulates that immigrants determine the level of money sent to their families back home based on altruism and self-interest (Lucas and Stark 1985). Remittances are considered altruistic if money is sent to improve the well-being of the recipients but they are considered self-interested if the money is being sent to take advantage of business opportunities. Some studies have found evidence of altruistic remittances (i.e. Chami et al. 2005 and Frankel 2011) while others found self-interested motivations (i.e. Barajas et al. 2009 and Neagu and Schiff 2009). However, these explanations work reasonable well only when the immigrant’s income is stable, or given.

The recent behavior of remittances was also rationalized by the continuous reduction in the costs associated with these transfers and the renewed movement of people around the world. The decline in fees for these transactions increased the frequency and even the quantity of remittances being sent. Rates have fallen to below 5 percent of the amount being sent to most Latin American countries (Orozco 2006), with countries that are important corridors experiencing the largest declines. The evolution of the immigrant stock experienced since the 1990s has also been influential. The relatively hard economic conditions in the region during the 1980s and 1990s increased the movement of people to more developed countries, raising the stock of emigrants and potential remitters.

It is clear that the motivations behind these flows, the stock of migrants working abroad, and the costs incurred in the transfer of these funds will be influential in the actual amount of remittances flowing to labor exporting countries under normal circumstances.

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However, during economic fluctuations remittances should be mainly influenced by the work opportunities that immigrant workers face in the host-countries. While most researchers recognize the importance that economic conditions in the host-country play in the determination of remittances, few incorporate them in their analysis. Economic fluctuations that affect their income should influence their ability and willingness to send money to their families back home (see Inter-American Development Bank (IADB 2012b) and World Bank (2011) for an extensive analysis of this issue). Remittances should be positively related to the business cycle of the country where immigrants work.

The importance these external conditions became clear during the recent economic crisis, when remittances to Latin American countries decreased as economic growth came to a halt in the U.S. and most of Europe. Remittances flowing into Latin America and the Caribbean declined by almost 13% in 2009 and increased by only 2% in 2010, a rate well below the average inflow experienced between 2002 and 2008 (17% per year). The slowdown in the U.S. reduced job opportunities, in particular for the foreign-born population, and has had a negative impact on income. In a recent study by IADB (2012), it indicates that the employment rate amongst Latin American migrants in the U.S. has fallen by 3.7 percent in 2009, recovered by 1.7 percent in 2010, and then increased by 1.8 percent in 2011 to return it to pre-crisis levels. Similar pattern was experienced by immigrants in European countries, with the only difference that the rebound was much weaker, and in fact still deteriorating in the case of Spain – where 16% of emigrants from Latin America are located.

Some evidence of the importance of external conditions for remittances can be found in the existing literature. Roache and Gradzka (2007) use quarterly data for a set of 14 Latin American countries for the period 1990 – 2007 and show that there is no consistent evidence of a steady relationship between the U.S. business cycle and remittances flows to the Latin American countries of their sample. They argue that remittances “smoothing”, lower reservation wage and labor inflexibility, or measurement errors explain this lack of influence (the definition of remittances was much broader back then). Ruiz and Vargas-Silva (2012) also examine the issue but for the Mexican economy. They use monthly data starting in January 1998 and show that the decline in the housing market experienced in the U.S. has had a negative effect in the flow of remittances to Mexico. However, they were not able to find a statistically significant influence for the other indicators of economic activity used in their study.

Magnusson (2009) use U.S. employment data to show that remittances flows to Mexico and El Salvador are strongly influenced by economic conditions in the specific regions (states) of the U.S. where the immigrants are clustered. Her results also indicate that construction shocks are important for Mexican remittances and that services shocks are important for remittances to El Salvador. Borja (2012) also looks at the effect of economic fluctuations in the U.S. on remittance flows to El Salvador and finds that a positive shock to U.S. GDP leads to a temporary increase in remittances but that unemployment shocks have no significant effect on the remittances flowing into El Salvador. This last finding was for both the overall unemployment rate and for the Hispanic unemployment rate.

Measuring the influence of such economic fluctuations in the host-countries on the amount of remittances flowing into origin countries is particularly important for Latin America. Remittances to this region have reached 61 billion U.S. dollars in 2011, with Mexico being the largest recipient with 22.7 billion dollars\(^1\) (IADB 2012). While other

\(^1\) Official remittances to Mexico are around 2% of GDP.
countries are receiving smaller amounts, the relative importance of these flows is much greater – i.e. remittances were almost 5% of GDP in Ecuador, above 10% in Guatemala, and approaching 18% in Honduras. Fluctuations in remittances can have important effects in the behavior and well-being of the recipient households, in terms of education, nutrition, health care, and entrepreneurial opportunities, but it can also be important for its macroeconomic implications, both in terms of inflation (Narayan et al. 2011, Vacaflores 2012), exchange rate fluctuations (Amuedo-Dorantes and Pozo 2004, Acosta et al. 2009) and economic performance (Cáceres and Saca 2006, Osili 2007, and Larrañaga 2012).

This paper estimates how shocks to either immigrants’ host countries or immigrants’ countries of origin affect the flow of remittances into a set of 5 Latin American countries. We thus examine “push” and “pull” factors to rationalize the response of remittances to economic fluctuations in the destination and origin countries. This task is done using a structural vector autoregression (VAR) model for the 1995:Q1 – 2011:Q3 period. Our method can identify the effect of U.S. economic shocks on the remittances flows to the countries in our sample. We do this while controlling for the effects of economic shocks to Spain, the second largest source of Latin America remittance flows, and to origin-country economies. We use real income in the host-country as our measure of immigrant’s financial strength, as it tracks the availability of resources to be remitted better than GDP or unemployment. We also examine whether shocks to certain sectors in the U.S. economy are more important than others in driving the remittance flows to the receiving countries, as migrants from different nationalities concentrate differently in particular sectors.

Presaging our results, we find that positive host economic shocks generally tend to increase remittance flows (with U.S. shocks exerting a larger effect for most countries), while positive origin-country economic shocks tend to decrease them. Our results suggest, then, that immigrant workers in the United States for example send more funds home when the U.S. economy does well, but will also send fewer funds home when their home country does well. Finally, we also find that positive shocks to food, accommodation, real estate, and construction income in the U.S. tend to be the biggest sectoral drivers of remittance flowing to the receiving countries, and that remittances to different countries are affected differently depending on the sector that fluctuates, presumably because of immigrant concentrations.

These results have implications for the forecasting of remittances and its effect on the receiving economies, as it identifies “pull” and “push” factors affecting the flow of remittances to developing countries. The efficiency of forecasting remittances to particular countries – and thus its effect on their economies – hinges on the understanding of the economic conditions of the countries that serve as the main destinations for the immigrants from a particular country and the severity with which these fluctuations effect the specific sector(s) in which the migrant population of a particular country are concentrated.

The paper proceeds as follows. Section 2 clarifies the importance of remittances for Latin American countries and describes the migration patterns to the main destination countries. Section 3 presents the empirical methodology and data. Section 4 discusses the results from the estimated VAR. Section 5 extends the VAR analysis by looking to sector-specific income shocks. Section 6 provides policy considerations and Section 7 summarizes and concludes.

2. Migration Pattern to the U.S. and Spain

This study concentrates in the importance of economic fluctuations in the U.S. and Spain for the remittances being send to Latin American countries. The examination of the
U.S. conditions is important because 68% of the migrant population from Latin American countries lives in the U.S. (country average 45%). In addition, the 13% foreign-born population in the U.S. is sending approximately $52 billion dollars in remittances to the rest of the world, which is only around 0.4% of the U.S. GDP but represents approximately 17% of all funds remitted worldwide. It is also important because of the economic interdependence that exists between the U.S. and most economies of the region. Spain is also relevant due the increased migration from its former colonies, attracting almost 10% of all migrants from the region (compared to a mere 1.6% of Latin American migrants back in 1990).

Because of data limitations, we focus on the behavior of the remittances flowing into Mexico, Brazil, El Salvador, Guatemala, and Bolivia. Figure 1 shows these flows and the average for these five countries for the period of 1995:Q1 – 2011:Q3. The bottom left graph of Figure 1 shows that the average remittance flows for these five countries where pretty stable during the 1990s, experienced a significant increase until 2007, and declined somewhat for a couple of years before picking up again. Also included in these graphs are the two U.S. recessions experienced during this period. This figure also suggests that remittance flows to these countries do tend to slow down during U.S. recessions.

While this observed slowdown in remittances experienced in 2008 and 2009 can perhaps be driven by the slower immigration into the U.S. (and Europe) due to stricter restrictions. 

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2 These five countries are chosen since they are the only ones that have quarterly remittance data going back to 1995.
enforcement of migration laws or the formalization and better accounting of these flows, we argue that economic conditions in the U.S. (and Spain) are at the center of this contraction. The percentage of migrants living in the U.S. is significant for most Latin American countries (an average of 45% in a set of 18 Latin American countries), and remittances originating from the U.S. are a significant portion of all remittances flowing into these countries. The top of Figure 2 shows that – according to the most recent migration data from the World Bank – there are 98.1% of all Mexican migrants living in the U.S., 88% of all migrants from El Salvador, and 86.4% of all Guatemalan migrants. While in relatively smaller proportions, 24.8% of all Brazilian migrants live in the U.S. and 10.6% of all Bolivian migrants also do. Clearly, economic fluctuations in the U.S. can have a large impact in countries that have higher proportions of their migrant population living in the U.S.

Figure 2: Shares of Latin American migrant population living in the U.S.A. and Spain
Source: The World Bank, Migration and Remittances Data (Bilateral Migration Matrix2010)

In the case of Spain, the average share of migrants living in this country is much smaller (15% in our sample of 18 Latin American countries) but represents the second preferred destination for the region and it is where 30% of all remittances flowing into Latin America originate. The bottom of Figure 2 shows that there are 40% of all Bolivian migrants and 11.9% of all Brazilian migrants living in Spain, but there are less than 1% of the migrants of the other three countries used in our study. For Bolivia, in particular, economic fluctuations
in Spain should be influential for the amount of remittances that its migrant population is able to send.

Furthermore, the concentration of this migrant population in different sectors of the host economy can lead to differential effects on the remittance behavior of different countries. Migrants from different countries may possess different skills and networks and thus might be disproportionately represented in different sectors. In the most recent report for the Pew Hispanic Center, Motel and Patten (2013) indicate that Mexican migrants in the U.S. are concentrated in the “arts, entertainment, recreation, accommodations, and food services” sector (15.6%), “construction” sector (14.9%), and “wholesale and retail trade, transportation, warehousing” sector (14.6%). Central American immigrants are concentrated in the “wholesale and retail trade, transportation, warehousing” sector (16.2%), in the “construction” sector (15.9%), and in the “arts, entertainment, recreation, accommodations, and food services” sector (14.6%). South American immigrants are concentrated in the “education, health and social services” sector (19.1%), in the “wholesale and retail trade, transportation, warehousing” sector (17.7%), and in the “business services” sector (13%). The same report also indicates that there exist a differential earning potential between migrants from different parts of Latin America, with Mexican immigrants earning on average $19,000 dollars per year, Central American immigrants earning an average of $20,000 dollars per year, and with South American immigrants earning on average $25,000 dollars per year.

3. Empirical Methods and Data

As noted above, we use a structural VAR to identify economic shocks in the destination countries—the United States and Spain—and in the origin country to examine their effect on remittance flows to the Latin American countries of our sample. Though our main interest is in the effect of U.S. shocks, we estimate Spanish shocks too to account for their potential influence on remittance flows. Formally, this can be demonstrated by beginning with the autoregressive structural model of the form

$$A_0 z_t = A_1 z_{t-1} + ... + A_p z_{t-p} + u_t$$

where $A_0, ..., A_p$ are $n \times n$ structural parameters matrices, $z_t$ is a $n \times 1$ vector of endogenous variables, and $u_t$ is a $n \times 1$ vector of uncorrelated structural shocks that are assumed to be multivariate normal with mean zero and unit variance. The vector of endogenous variables is as follows:

$$z_t = (y_{t1}^{D1}, y_{t2}^{D2}, y_t^O, r_t)'$$

where $y_t^{D1}$ is a measure of real economic activity in the first destination country (the United States), $y_t^{D2}$ is a measure of real economic activity in the second destination country (Spain), $y_t^O$ is a measure of real economic activity in the origin country (the Latin American country), and $r_t$ is the remittances flowing to the receiving country. We estimate this model separately for each Latin American country so that $y_t^O$ and $r_t$ refer to only one country.

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3 For convenience of exposition, deterministic components are ignored in this discussion. Their inclusion does not change the general conclusions found here.
As is standard practice, we first estimate the reduced form version of this VAR and then impose restrictions to identify structural relationships. Our identification strategy for the model is threefold. First, we impose block exogenous restrictions on the VAR such that a destination economic shock can affect economic conditions in the origin country, but not vice versa. For our model, that means U.S. and Spanish economic shocks can affect the Latin American economy in question, but not the other way around. We impose this restriction since the destination economies are larger and more important to the global economy than the origin economies. For the same reason, we also impose the restriction that U.S. shocks can affect the Spanish economy but not vice versa. Second, we restrict remittance flow shocks such that they can influence the origin economy but not the destination (i.e. U.S. and Spain) economies. However, both destination and origin economic shocks are allowed to affect remittance flows. Finally, we use a recursive factorization of the covariance matrix to orthogonalize the innovations. Collectively, these restrictions imply that origin economy shocks and remittance shocks cannot influence the destination economies contemporaneously or with a lag. Table I summarizes the block exogenous restrictions.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Block Exogenous Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Economy</td>
<td>No</td>
</tr>
<tr>
<td>Spanish Economy</td>
<td>Yes</td>
</tr>
<tr>
<td>Origin Economy</td>
<td>Yes</td>
</tr>
<tr>
<td>Remittance Flows</td>
<td>Yes</td>
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</tbody>
</table>

Table I: Block Exogenous restrictions

Since the right-hand side of the equations in the VAR are not identical, we estimate the model as a Seemingly Unrelated Regression (SUR) since this approach produces more efficient estimates than OLS equation by equation. Once the model is estimated and the structural shocks are identified, innovation accounting can be done to see the effect of these shocks on remittance flows. In particular, impulse response functions (IRFs) can be used to show the dynamic response of remittance flows to destination and origin economic shocks. While IRFs can show the typical dynamic response of remittance flows to such shocks, they do not reveal how important the shocks are in explaining the overall variation of remittance flows. Therefore, we use another form of innovation accounting called variance decomposition (VDC) to assess this question. A VDC shows what percent of the VAR’s forecast error can be attributed to a specific shock. Here, we use the VDC to determine how important destination and origin economic shocks are in explaining the forecast errors of

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4 See Enders (2010) for more on the estimation of reduced form VARs and how to transform them into structural models.

5 In the case of Brazil, Spain is about the same size not larger. However, allowing Brazilian shocks to affect Spain made no meaningful difference to the estimate IRFs for Brazil’s remittance flows. Because of this fact and our desire to estimate the model consistently across all countries we kept the block exogenous restrictions the same for Brazil.

6 That is, we impose a Choleski decomposition of the covariance matrix.
remittance flows. In the subsequent section we report results for both forms of innovation accounting.

For destination economic activity, we use real U.S. and Spanish personal income. We use this measure rather than real GDP since real personal income should have a more direct effect on remittance flows. In the case of the United States, personal income data is also useful since it can be broken down into income earned by industry, something we do later in the paper. We measure origin country economic activity by industrial production in each country. This and the remittance flow data were collected from the St. Louis Federal Reserve’s FRED database, the IMF’s IFS database, and the central banks of the Latin American countries of our sample. All variables are transformed into log levels and though standard unit root tests indicate nonstationarity in the levels of the variables, we follow the common practice of estimating the VAR in levels since it has been shown that doing so does not asymptotically bias the coefficient estimates of the VAR parameters (Sims et al. 1990). Moreover, estimating in levels allows for cointegration while not imposing it.\(^7\) The data are all at a quarterly frequency and our sample spans the period 1995:Q1 through 2011:Q3.\(^8\) Here, 5 lags are chosen for the VARs since the Ljung-Box Q test indicates that this amount is enough to eliminate serial correlation and because the LR lag test suggests 5 lags are adequate to capture the dynamics of the data.

4. Results

Figure 3, in the Annex, reports the impulse response functions (IRF) of remittance flows to a 1 percent shock to the real economic activity measures. The solid line in the figure shows the IRF point estimate while the dotted lines show simulated 95% error bands.\(^9\) For Mexico, El Salvador, Brazil, and Guatemala the shock to U.S. real personal income per capita leads to permanent increases of approximately 4.0 to 7.5 percent in the level of remittance flows – greater economic activity in the destination country helps “push” higher levels of remittances to the countries of origin. This effect is statistically significant for the first three countries but only marginally significant for the Guatemalan case. For these same countries, a positive shock to economic activity in the origin country leads to either a fall or small—and in the case of Guatemala statistically insignificant—increase in remittance flows. This suggests that an improvement in origin country economies may signal to immigrant workers in the United States that there is less need to send remittances home, reducing the need to “pull” resources to the countries of origin because of precarious conditions in those countries. Bolivia is the exception here. Its remittance flow response to U.S. real personal income shocks is also positive and statistically significant but only temporary. Moreover, the remittance response to a positive Bolivian economic shock is positive and permanent, showing a stronger “pull” effect than in the other countries of our sample. Overall, though, it appears migrant workers tend to send more funds home when the U.S. economy improves, but also tend to send fewer funds home when their home economy does better.

Since 98% of all Mexican emigrants and 87% of all Salvadorian emigrants live in the U.S., their larger and consistent impact from a shock to the U.S. economy is understandable. However, even if 86% of all Guatemalan emigrants live in the U.S., the smaller and marginal

\(^{7}\) Therefore, there is no need to do a VECM as shown by Sims et al. (1990).

\(^{8}\) In the case of Bolivia, the data runs through 2010:Q4.

\(^{9}\) The error bands are technically the 2.5% and 97.5% fractiles that come from using Monte Carlo integration techniques to estimate the posterior density of the response coefficients as recommended by Sims and Zha (1999).
statistical significance of the impact on remittances is less clear. The relatively large impact on Brazilian and Bolivian remittances is somewhat surprising, given the smaller share of their migrant population living in the U.S. (24.8 and 10.6 percent, respectively). These last three cases suggest that is not just the economic performance of the host country what determines the amount of money being sent to the families and relatives in the countries of origin. Differences in altruism could be driving these responses, causing a variation in the “push” effect to the different countries of the sample. Or perhaps the different participation in alternative economic sectors by immigrants from different nationalities could lead them to perform differently in terms of earnings, and thus in their ability to remit. This last point seems more realistic and is the one that we explore in the next section.

While economic shocks in the U.S. are influential for most countries of the region, the performance of the Spanish economy can also be important, given the increasing share of the Latin American migrant population that is choosing that destination. However, our results indicate that the Spanish shock leads to statistically insignificant responses in every case but Mexico and Bolivia. In the case of Bolivia, the shock leads to a permanent response just under 13%, more than twice the effect from the U.S. shock. This result is consistent with the relatively larger share of Bolivian migrants living in Spain (40% compared to the 10% of all Bolivian migrants living in the U.S.). However, in the case of Mexico the result is less clear, given that there are less than 1% of all Mexican emigrants living in Spain.

How economically important these relationships are can be seen in Figure 4 in the Annex. This figure shows the variance decomposition of the remittance flow forecast errors due to destination and origin economy shocks. The figures are set up to specifically report the percent of the forecast error attributable to each shock. For every country but Bolivia, the portion of the forecast error explained by the shock to U.S. personal income is far greater than that attributed to both Spain and origin economy shocks. For Mexico, El Salvador and Brazil anywhere from 52 to 80 percent of the forecast error at their peak can be traced to U.S. economic shocks, while that caused by Spanish shocks is 1 to 38 percent, and for origin economy shocks it is 2 to 12 percent. For Guatemala, the numbers are more modest but they still show a significant difference: 21 percent due to U.S. economic shocks, 5 percent due to Spanish shocks, and 3 percent due to Guatemala economic shocks.

Bolivia, again, is the outlier with about 67 percent of its forecast error attributable to Spanish economic shocks versus 11 percent due to U.S. economic shocks and 10 percent to Bolivian shocks. However, as it was mentioned above this alternative behavior can be rationalized by the larger share of it migrant population located in Spain. For our set of Latin American countries, then, remittance flows appear to be far more sensitive to U.S. economic shocks than Spain or any origin country economic shocks.

Overall, these results show that remittances flowing to these Latin American countries are positively affected by external economic conditions, in this case by those in the U.S. and Spain. In terms of the influence of domestic economic conditions, our results in Figure 3 can also suggest that remittances being sent to Mexico and El Salvador are perhaps more altruistic in nature, as there is an inverse relationship between their economic conditions and the amount being sent in (a negative “pull” factor), but that the remittances being sent to

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10 Note that the sum of the forecast error explained by the two shocks does not add up to 100%. The difference between this sum and 100% can attributed to other, unexplained factors affecting the forecast error.
Brazil and Bolivia are perhaps being send to take advantage of economic opportunities, as the positive relationship could imply a more self-interested motivation (a positive “pull” factor).

5.- Extensions

The above analysis points to U.S. economic shocks being an important driver of remittance flows to Latin America, bringing to relevance the importance of this “push” factor in the determination of remittances flows. It also shows that these economic shocks do not have a similar impact on the remittances flowing to the different countries of the sample. In fact, migration shares alone cannot explain this differential effect. This finding begs the questions of whether certain sectors in the destination economy are instead more important than others in influencing remittance flows. In this section we consider this question by breaking down total personal income in the U.S. into its component parts. Specifically, we look at the personal income earned from the following six grouping of sectors: agricultural and forestry; construction and real estate; accommodation and food services; manufacturing; mining; and all other services. With these six sector groupings, the VAR was re-estimated with now being defined as the ratio of a sector’s income to total personal income. That is, the VAR is estimated six times, each time with the share of total personal income coming from a particular sector being used as the measure of U.S. economic activity. Using this ratio allows us to look at changes in sector income relative to changes overall in personal income and thus see how unique changes or shocks to a particular sector’s personal income influence remittance flows. Other than this change, the VAR is estimated the same as before.

Figure 5 reports the remittance flow IRFs from this exercise for each country to a 1 percent shock to each sector. For Mexico, this figure shows that shocks to the agriculture and forestry share has no statistically significant effect on remittance flows. Shocks to construction and real estate income create positive remittance flow responses, as do accommodation and food income shocks. The latter response is particularly large, about 6 percent. This suggests that the high concentration of Mexican immigrants in these industries (14.9% in construction and 15.6% accommodation and the food sector) is important for the behavior of remittances, and is in line with the results found in other studies (i.e. Ruiz and Vargas-Silva 2012, Magnusson 2009). However, shocks to mining, manufacturing, and other services shares do lower remittance flows. This negative effect perhaps arises from the fact that as the share of income in these sectors rises, at the detriment of the shares in the other sectors, the positive effect on remittances flows from a relatively smaller concentration of immigrants in these sectors (i.e. mining and other services) is outweighed by the negative effect on the income of the sectors with relatively larger concentrations.

For El Salvador, accommodation and food services, construction and real estate, and other services produced meaningful increases in remittance flows, particularly the former, in accord with the share of Central American immigrants working in these sectors. It is worth noting that Central American immigrants have a higher proportion of their workers in the “other services” sector (9.2% compared to 6.5% of Mexican immigrants working in this sector), difference large enough to overturn the effect found in the Mexican case. Also, while the difference in immigrant shares working in the accommodations and food services is not that large (15.6% for Mexican immigrants compared to 14.6% for Central American immigrants), the significant smaller effect found in El Salvador – relative to the Mexican response – is perhaps indicative of an even smaller share of Salvadorian immigrants working in this sector. It is also found that while mining has no statistically significant effect on remittances, a positive U.S. agricultural income shock leads to a slight temporary decrease in
remittance flows and a more permanent decline in the manufacturing sector. This last response is similar to Mexico, and its negative effect can perhaps also be rationalized by the influence of immigrant representation in these alternative sectors.

Brazil’s IRFs follow a similar pattern to Mexico and El Salvador. Once again, accommodation and food services and construction income shocks generate strong remittance flows, both being statistically significant like in the previous countries but with magnitudes more similar to those of El Salvador. However, in both of these sectors the participation of South American – Brazilian – immigrants is much smaller than that of Mexican immigrants (8.1% instead of 14.9% in construction and 11.4% instead of 15.6% in the accommodations and food services). Agricultural and other services income shocks leads initially to fewer remittance flows but quickly becomes insignificant while shocks to mining and manufacturing income result in a decline of remittance flows. The participation of South American – Brazilian – immigrants in the manufacturing sector is much smaller than that of Mexican immigrants (38 percent lower) and that of Central American immigrants (24 percent lower), which perhaps explains the stronger negative effect as it takes away income from sectors where it has higher representation.

Other than other services, Guatemala’s remittance responses closely follow the IRFs of Mexico, El Salvador, and Brazil. In the case of the accommodation and food services sector, income shocks create a large positive response of remittances, generating a much larger effect in the long term than in the other countries of the study. We also find that the positive shock to construction and real estate income generates a highly significant positive remittance response, but only after a delay of 5 quarters. Interestingly, we find a positive and statistically significant response of remittances from the shock to “other services” income, although is temporary. Just like in the case of El Salvador, this positive response can be arising from the relatively larger share of the Central American migrant population that is employed in these other services. Meanwhile, mining and manufacturing here too lead to declines in remittance flows, like in the Mexican case, perhaps because the reduce income in the sectors where they have a higher proportional representation.

Bolivia continues to be the odd one out. While the negative effect on remittances arising from the shock to manufacturing and other services is similar to those found in Mexico and Brazil, here we see that accommodation and food service income shocks leads to no statistically significant change. In line with the results in the other countries of the sample, we find that a positive shock on construction and real estate income generates a positive response on remittances, which is temporary but much stronger than in the other countries. Moreover, agricultural and mining income shocks lead to sustained and large increases in remittance flows for Bolivia. This is more intriguing, since only 0.1% and 0.2% of the South American immigrants are working in agriculture and in mining, respectively. Perhaps the specific participation of Bolivian immigrants in these two sectors is higher than those from the other countries of the region – both are important sectors of the Bolivian economy.

If one considers that these positive shocks in specific sectors are a good representation of the working opportunities of the immigrants from this set of countries, and thus a good determinant of their income potential and ability to send remittances to their families back home, then our results can also point to their relative representation in each sector. Positive effects reflect the “push” effect of better economic conditions, but the negative effect seems to reflect declines in relative income in the sectors with higher immigrant representation, creating a decline in overall remittances. According to this dynamics, the magnitudes of the IRFs suggest that there are relatively more Mexican
immigrants working in the accommodation and food services followed by a high concentration in construction and real estate. Immigrants from El Salvador, Brazil and Guatemala seem also concentrated in these two sectors, with Salvadorian and Guatemalans also reacting positively from shocks in other services. In the case of Bolivian immigrants, it seems that there are more heavily concentrated in the agricultural and mining sectors.

Collectively, these IRFs indicate that remittances flowing to Latin America tend to be very sensitive to accommodation and food services income shocks and construction and real estate income shocks. In addition, these results also suggest that fluctuations in different sectors of the U.S. economy produce a differential effect in the remittances that flow to the different countries of our sample. These results can be used with the findings from the previous sections to perhaps rationalize the differential effect of a shock to the U.S. economy on the remittances flowing to the countries of our sample, particularly for Guatemalan and Bolivian remittances. In the first case it seems that the delayed impact from construction and real estate together with the smaller effect from the accommodations and food services in the short run are the drivers of the smaller and insignificant effect of the shock to overall U.S. income on remittances. In the Bolivian case it seems that positive contribution from agriculture and mining are large enough to sustain the response of remittances from overall economic improvements, as fluctuations in these two sectors have been magnified during recent business cycles.

6.- Policy Implications

The remittances inflows experienced in most developing countries have the potential to fuel economic development. Receiving countries can directly influence the cost of these monetary transfers, by making their financial sector more competitive (with Colombia and Ecuador showing clear examples of policies that altered the cost of remitting), and to a certain degree the end use of these remittances. They can also relax the restrictions on this type of financial flows that are entering their economies. Mexico provides a good example of promoting remittances, as it allows Hometown Associations to send funds that are matched by the government to implement projects that benefit specific areas (roads, schools, etc.). They can also provide more stability in the exchange rate, thus reducing an important component of the cost of remitting – which is significant for some countries – and promoting further inflows of remittances.

However, even if it is beyond their control to affect the economic conditions of the destination countries, remittance receiving countries should monitor the performance of these economies in order to forecast this important capital flow and manage potential effects to their own economies. In addition to the traditional impact on the economic performance of Latin American countries, the impact of economic fluctuations in different labor markets of the U.S. will affect the ability to generate income and perhaps the willingness to send remittances to specific countries differently, depending on the relative concentration of the migrant population. Consequently, such economic fluctuations in the host-countries can also indirectly affect the performance of the origin countries by reducing remittances and consequently the consumption and investment levels of the receiving households. Domestic policies thus should account for the direct effect of these external shocks on their economic activity and also for the indirect effect brought by the fluctuation in remittances.

Furthermore, since economic fluctuations affect different sectors of the economy differently, diplomatic missions should put more emphasis on the collection of work related information of their migrant population. Just as they provide services, the generation of a database with employment participation in specific sectors would provide valuable
information for forecasting remittances patterns arising from changing conditions in specific sectors of the host country. This collection of information is particularly important in destination countries that host large shares of their migrant populations, countries in which they supposedly have the most extensive diplomatic networks in place.

7. Conclusions

Our study provides evidence of the effect that economic fluctuations in the host countries can have on the amount of remittances flowing into Latin American countries. Our results indicate that positive U.S. economic shocks generally tend to increase remittance flows to these countries, “pushing” resources to receiving countries. Our results suggest, then, that immigrant workers in the United States send more funds home when the U.S. economy is doing well, but will also send more funds home when the economic conditions in their country of origin deteriorate. This “pull” effect that arises from the economic conditions in the country of origin can be interpreted as altruism as precarious conditions are positively related with larger flows. The exception is Bolivia, where the biggest external contributor to remittances is the economic conditions of Spain and where domestic economic improvements lead to higher remittances, perhaps more representative of a self-interested motivation “pulling” resources to this country.

In addition, we also find a differential impact of the remittances flowing to different countries of our sample, result that perhaps arises because the concentration of the migrant population of these countries may be in different sectors of the U.S. economy. For example, we find that positive shocks to accommodation and food service income leads to the largest increases in remittances flowing to the countries of our sample. We also find that shocks to construction and real estate income create statistically significant increases in remittances in most countries of the sample, with the exception of Bolivia. Similarly, shocks to other services income is found to have a positive effect on remittances for El Salvador and Guatemala, countries where the share of their immigrant population have significantly higher rates of their population working in this sector. However, we also find that agricultural and mining income shocks only have a positive effect on Bolivian remittances.

Although the countries that are receiving these remittances cannot influence the economic conditions of the countries in which their migrant population are located, they should monitor the economic conditions of these host-countries to adequately forecast the inflow of remittances, which can be a significant share of GDP in some economies. Furthermore, since the migrant population of a specific country tends to concentrate in a specific niche, the performance of specific sectors of the economy should also be monitored and used as indicator for forecasting the future evolution of these resources flowing to labor exporting countries.

References


Annex on line at the journal Website: http://www.usc.es/economet/eaat.htm
Figure 3: Remittances flows response to a 1% shock, quarters after shock in horizontal axis.
Figure 4: Decomposition of Forecast Error Variance, quarters after shock in horizontal axis.
Mexico Remittances

El Salvador Remittances

Figure 5: Remittances Flows Response to a 1% U.S.A. Sectoral Shocks, quarters after shock in horizontal axis.
Brazil Remittances

Guatemala Remittances

Figure 5: Continued...Remittances Flows Response to a 1% U.S.A. Sectoral Shocks, quarters after shock in horizontal axis.
Bolivia Remittances

Figure 5: Continued....Remittances Flows Response to a 1% U.S.A. Sectoral Shocks, quarters after shock in horizontal axis.