# Monetary Policy and International Remittances

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**ABSTRACT**

This article studies the response of Mexico's monetary policy to inflows of workers' remittances. Previous studies have shown that remittances can have an impact on several macroeconomic variables of the receiving country (e.g. exchange rate, inflation and output, among others). Mexico has the largest inflow of remittances in Latin America and the second largest inflow in the world. As such, it may be the case that the monetary authority in Mexico is taking these flows into account when selecting their monetary policy stance. Overall, the results of this study indicate that remittance shocks do not have a large impact on Mexico's monetary policy variables. This seems to suggest that Mexico's Central Bank main concern is inflation and that the potential appreciation of the Mexican currency as a result of increased remittance inflows might not be a priority.

## INTRODUCTION

Each day thousands of immigrant workers in developed countries send money to their families in developing countries. The amounts of the individual transfers are not usually large. It is just a few hundred dollars here and a few hundred dollars there, however, the total sum of these flows can reach enormous dimensions. According to the World Bank, the worldwide flow of workers' remittances during the year 2007 was about 240 billion U.S. dollars (World Bank, 2006). With such magnitude, it would be hard to imagine that government authorities in receiving countries are not taking these flows into account when developing new policies and adjusting existing ones.

Given the shortage of external financing in developing countries, remittances are usually welcomed as means to promote investment and stimulate economic growth. Remittances also provide a source of foreign exchange to finance imports and relax balance of payment constraints. At the same time, receiving countries may worry about the potential negative consequences of these inflows. A large fraction of remittances is spent on consumption (Zarate-Hoyos, 2004; Orozco, 2003). Accordingly, remittances are capable of increasing the price of non-tradables in the receiving country, producing inflationary pressures. Previous studies also suggest that remittances may appreciate the

receiving country's currency (Amuedo-Dorantes and Pozo, 2004; Vargas-Silva, 2008), potentially affecting the competitiveness of the tradable sector. Furthermore, microeconomic studies have shown that remittances have important impacts on different aspects of household behavior, including potential decreases in labor supply (Amuedo-Dorantes and Pozo, 2006) and may provide the capital necessary for the development of microenterprises (Woodruff and Zenteno, 2001).[1]

Along these lines, remittance inflows present a difficult choice for receiving countries, because they may exert contradictory effects on several conflicting policy objectives (external financing, inflation, export competitiveness, among others). In order to minimize the possible detrimental impact of remittances, receiving countries can use changes in fiscal policy and/or monetary policy. In this article, our intent is to understand whether and how central banks in receiving countries respond to these flows of money. More specifically, we study the response of Mexico's monetary policy variables to remittance shocks. While there is an extant literature about the response of monetary policy to other capital inflows (e.g. Kwack, 2001; Reinhart and Smith, 1998), empirical studies on the response of monetary policy to remittances have been absent from the literature.[2]

The Mexican experience represents a unique and interesting case for studying the interaction between remittances and monetary policy for several reasons. First, Mexico has a huge inflow of workers' remittances (largest inflow in Latin America). In the year 2006, Mexico's inward remittances accounted for more than 30 percent of the remittance inflows in Latin America, reaching over 23 billion U.S. dollars (Inter-American Development Bank, 2007). Equally important, after oil exports and Maquiladoras, remittances are the third source of foreign currency in Mexico (Cañas *et al*. 2007). Finally, during the last decade Mexico's Central Bank adopted inflation-targeting and a flexible exchange rate system. Thus, at least in theory, we have a central bank with a clear policy objective.

In other countries, where remittances play a minor role, these flows are not expected to have an impact on monetary policy. If these flows are not large and/or not significant given the total size of the economy, then their impact on variables like inflation, exchange rates and output will be minimal. But in Mexico, the largest remittance receiver in Latin America, it is possible for remittances to influence monetary policy.[3] In fact, Mexico's Central Bank has been acknowledging the role of remittances in its annual monetary policy program. For example, its 2006 monetary policy program stated that:

> *"Just like in 2004, during 2005 the performance of domestic expenditure and economic activity benefited from the significant increase in Mexico's oil trade balance surplus and by revenues from workers' remittances. Workers' remittances have become very important for private consumption expenditure as confirmed by the total inflow of remittances received in 2005, which was equivalent to one third of wage earnings in the formal sector of the economy. In some states, workers' remittances exceeded formal wage earnings", (*Banco de Mexico, 2006 Monetary Policy Program, p.12*).*

Similar remarks can be found in previous monetary policy programs. Mexico's Central Bank seems to be aware of the large inflow of remittances. Are monetary policy variables in Mexico responding to these flows? In the remainder of this article we intent to answer this question. The article is organized as follows. In Section 2 we describe the implementation of monetary policy in Mexico. Section 3 introduces the methodology and discusses the selection of the monetary policy variable. Section 4 presents the data. Section 5 discusses the empirical results. Section 6 presents a robustness check and Section 7 concludes.

## MONETARY POLICY IN MEXICO:
## CRISIS, INFLATION-TARGETING, AND *CORTOS*

Eichengreen (2001) defines an inflation-targeting regime as one with four characteristics. First, there needs to be an institutional commitment to price stability. Second, there should be mechanisms to render the central bank accountable for obtaining the monetary policy goal. Third, the central bank should announce an inflation target at the beginning of each period. Finally, there must be a clear explanation from the central bank behind the rationale of its decisions. Since 1995, Mexico's monetary policy has moved towards a system with these four characteristics. Therefore, we can tentatively classify Mexico as an inflation-targeting country.

However, not everyone would fully agree with the classification of Mexico as an inflation-targeting country. Calvo and Reinhart (2002), for instance, argue that Mexico exhibits "fear of floating." That is, Mexico's Central Bank claims to be pursuing an inflation target and domestic policy goals, but it is also intervening indirectly to manipulate the exchange rate. While Reinhart (2000) also reports similar conclusions, several authors have disputed these findings. Edwards and Savastano (1999) argue that in terms of exchange rate volatility, Mexico does not appear to be different from other floaters, and conclude that Mexico has a free-floating exchange rate system. Levy-Yeyati and Sturznegger (2002), using different techniques, also provide evidence that Mexico has had a free-floating exchange rate at least since 1997. More recently, Ball and Reyes (2004) found that Mexico is an inflation-targeting country that has occasionally misbehaved and not a country with "fear of floating." In sum, the previous literature has provided mix results about this issue.

Remittances enter Mexico as U.S. dollars and households convert this money into local currency, increasing money demand. However, given that the money supply does not change, we should see no change in inflation. Therefore, in a strict inflation targeting regime the central bank would be expected not to react to remittance flows. However, the increased demand for domestic currency should appreciate the domestic country's currency, and if monetary authorities are worried at any degree about the potential appreciation of the currency, then we should see a response of monetary policy to remittances. Given the previous discussion about the uncertainty in the goals of Mexican monetary policy we cannot rule out this possibility. Figure 1 shows the inflation level and the inflation objective announced by Mexico's Central Bank each year during the 1997 – 2007 period. There has been a large reduction on inflation in Mexico since 1997. Inflation decreased from 15.7 percent in the year 1997 to 3.76 percent in the year

2007. The inflation target has remained at 3 percent since 2003. In what follows we provide a short description of the implementation of monetary policy in Mexico.

Before the year 1995, Mexico operated under a crawling peg exchange rate system. There was a target band for the nominal exchange rate (Mexican pesos *vis-á-vis* the U.S. dollar). The upper limit of the band was raised slightly each day by a preannounced amount, allowing for a gradual nominal devaluation of the Mexican peso. At the end of 1994, Mexico underwent an exchange rate and financial crisis. As a result of the crisis the credibility of Mexico's Central Bank was severely damaged. The main criticisms were the lack of transparency in the conduct of monetary policy, the lack of dissemination of information, and insufficient determination to restrict monetary policy (Martinez *et al.*, 2000). This crisis forced Mexico's Central Bank to adopt a floating exchange rate during the year 1995. Mexico's Central Bank started using the accumulated balances of credit institutions in their Central Bank current accounts as their main policy tool.

**FIGURE 1. ACTUAL INFLATION LEVEL AND INFLATION TARGET**
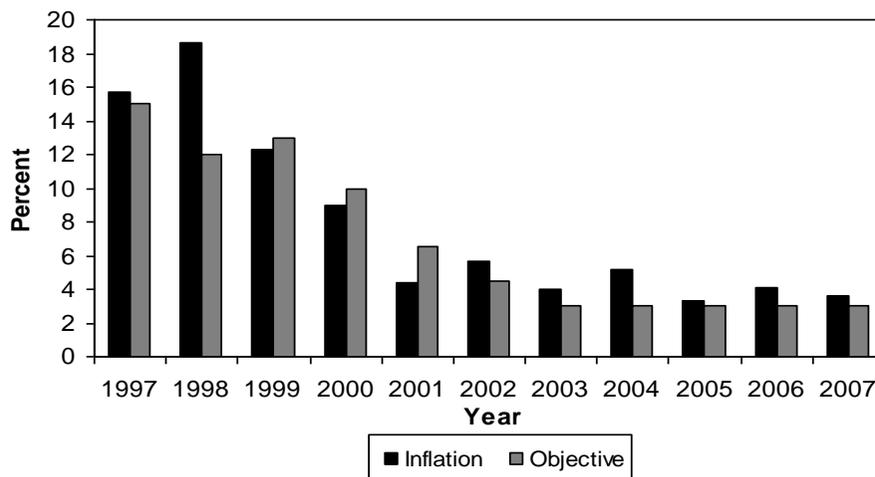


Banks in Mexico used to have a reserve requirement of zero. The Central Bank changed this requirement to a system in which banks are required to have a zero daily average balance in their current accounts with the Central Bank over a 28-day window. More specifically, banks in Mexico are allowed to have a negative balance in their current accounts with the Central Bank, provided that during a 28 day period, the negative balances are offset with positive balances. If any credit institution has a negative balance after 28 days, then Mexico's Central Bank penalizes that institution. The penalty is equal to an interest rate that exactly doubles the market rate (28-day CETES interest rate). Of course, banks in Mexico do not want to keep positive accumulated balances in their current accounts in the Central Bank either. Each dollar of excess reserves is costly in terms of the foregone interest.

A neutral monetary policy stance for Mexico's Central Bank is one in which banks have a zero balance in their current accounts. In this case, the total demand for base

money is satisfied at market interest rates. That is, Mexico's Central Bank would be providing the necessary resources so that no bank is forced to incur in overdrafts or to accumulate undesired positive balances at the end of the holding period (Martinez *et al.*, 2000). A tightening of the monetary policy stance of Mexico's Central Bank would involve some banks having negative accumulated balances in their current accounts. The penalty for the negative balances is twice the market interest rate, and therefore banks would like to avoid the penalty by obtaining resources from the money market. Consequently, interest rates in Mexico would rise. This is what Mexico's Central Bank refers to as a "short" or *corto* in Spanish. Mexico's Central Bank is satisfying a portion of the demand for base money by inducing an overdraft in the banks' current accounts. Using the *corto*, Mexico's Central Bank is able to send a signal to the market that it has adopted a restrictive monetary policy stance, without the need to choose a specific level for the interest rate.

## METHODOLOGY AND MONETARY POLICY VARIABLE

We use impulse response functions and variance decompositions derived from a vector autoregressive (VAR) model to study the impact of remittances on monetary policy in Mexico. Impulse response functions show the predictable response of one variable after a shock to another variable in the system. For example, if the impulse response function of the monetary policy variable to a shock to remittances shows a positive response, then presumably the monetary policy variable will respond positively to innovations in remittances. Variance decompositions show the portion of the forecast error variance for each variable that is attributable to its own innovations and to innovations from the other variables in the system.

It is possible that remittances and monetary policy respond to the same set of variables. For instance, it is argued that a large portion of remittances are altruistic payments from migrants to their families in Mexico. This implies that remittances may decrease after increases in income in Mexico. But increases in income, will most likely lead to a tighter monetary policy to avoid inflationary pressure. Thus, by including only remittances and the monetary policy variable in the estimation we could reach a misleading conclusion. In order to obtain accurate inferences, we need to include a series of control variables to account for Mexico's economic activity, inflation and exchange rate, among others. Also, it is clear that these macroeconomic variables are endogenous. The VAR used in the empirical estimation addresses the potential simultaneous relation among the variables.

Before discussing the additional variables included in the estimation, we must decide what variable to use to represent the ease or tightness of monetary policy in Mexico. As explained above, the main policy tool for Mexico's Central Bank are the accumulated balances of banks in their current accounts. But the impact of changes in the accumulated balances on the interest rate (which is determined by the market) is what matters for policy applications. Two *cortos* of the same magnitude may have different impacts on the interest rate, depending on the prevailing economic conditions in each situation. So, it is likely that interest rates also reflect monetary policy in Mexico (see Schwartz and Torres, 2000). In fact, several studies about Mexico have used the interest

rate as the monetary policy variable (e.g. Ball and Reyes (2004) and Martinez *et al.* (2000)).

Given the concern of adopting one or the other variable to represent monetary policy in Mexico, we look at both possibilities. The variables included in the VAR are U.S. real interest rates (*usi*), Mexico's output gap (*ygap*), Mexico's inflation gap (*pgap*), Mexico's exchange rate gap (*qgap*), the accumulated balances of banks in their current accounts with Mexico's Central Bank (*b*), Mexico's real interest rate (*i*) and remittances (*r*). Mexico's interest rate and the accumulated balances of banks in their current accounts are the two potential monetary policy variables. The gap for output, the exchange rate and inflation is constructed as: $GAP_t = VARIABLE_t - TREND_t$. The trends are obtained using the Hodrick and Prescott (1997) filter.

In order to compute variance decompositions and impulse response functions, the residuals of the VAR must be orthogonalized. In this article, a Cholesky decomposition is used to produce orthogonal residuals. The Cholesky decomposition imposes a recursive structure, so that variables higher in the ordering are not affected contemporaneously by shocks to variables lower in the ordering. The ordering of the variables in the model is *usi, r, ygap, qgap, pgap, b, i*. This ordering assumes that innovations to U.S. interest rates are contemporaneously uncorrelated with innovations to the other variables. The ordering also assumes that shocks to remittances are capable of affecting domestic macroeconomic variables contemporaneously. Finally, the ordering assumes that Mexico's monetary policy is affected contemporaneously by shocks to U.S. interest rates, remittances, Mexico's output gap, the exchange rate gap and the inflation gap. The VAR is estimated in levels. We include 8 lags in the estimation. Q-statistics are used to confirm the absence of serial correlation in each equation of the VAR, indicating that the lag length is adequate.

## DATA

The sample period is restricted to January 1997 – February 2008 for two main reasons. First, while monthly data on remittances is available at least since 1995, we want to place some distance between the 1994 Mexican financial crisis and the beginning of the sample period. Second, in 1997 Mexico's Central Bank in addition to announcing an inflation objective for that year, also announced an inflation objective for the following years. This may be interpreted by some, as a stronger commitment to inflation-targeting on the part of Mexico's Central Bank.

The accumulated balances of banks in their current accounts with Mexico's Central Bank are seasonally adjusted and expressed in real terms. Mexico's real interest rate corresponds to the interest on one-month government bonds or 28-day CETES. The CETES (Certificados de la Tesorería de la Federación) are the Mexican counterparts of the U.S. Treasury bills. Mexico's seasonally adjusted consumer price index (CPI) is used to construct the inflation series and to transform the Mexican variables into real terms. Income is measured as Mexico's industrial production. The exchange rate is defined as Mexican pesos per U.S. dollars and the U.S. Federal Funds Rate is used to obtain the U.S. real interest rate.

Total family remittances to Mexico are included as a measure of Mexico's inward remittances. This variable is seasonally adjusted and expressed in real terms.

Table 1 reports the dollar amount of remittances received by Mexico during the period considered in this study. Remittances have been increasing constantly during that period. From 1997 to 2007 remittances averaged more than 12 billion U.S. dollars per year and a growth rate of about 18 percent. There are several factors that may have contributed to this large increase in remittances. First, for years the remittance market was dominated by a small number of specialized transfer companies (e.g. Western Union) charging high fees per transaction (Ratha and Riedberg, 2005). Recently, several banks and local companies have entered the remittance market, decreasing the transaction costs of sending money abroad. For the case of Mexico it is argued that remittance costs may have decreased by about 50 percent in recent years (Cañas et. al 2007). The significant decline in the cost of transferring money across countries and the increased availability of places to transfer money has spurred an increase in transfers (Cañas et. al 2007; Freund and Spatatora 2005). There has also been a shift towards sending remittances through formal channels, making it easier for Mexican government authorities to track these flows.

The data used in the estimation are in monthly frequency. All the data from the U.S. comes from the Federal Reserve Bank of St. Louis. Mexican data are from Mexico's Central Bank.

## TABLE 1. REMITTANCES IN BILLIONS OF U.S. DOLLARS

| Year | Remittances | Growth Rate |
|---|---|---|
| 1997 | 4.9 | 15.2 |
| 1998 | 5.6 | 15.7 |
| 1999 | 5.9 | 5.0 |
| 2000 | 6.6 | 11.2 |
| 2001 | 8.9 | 35.3 |
| 2002 | 9.8 | 10.3 |
| 2003 | 13.4 | 36.5 |
| 2004 | 16.6 | 24.0 |
| 2005 | 20.0 | 20.6 |
| 2006 | 23.1 | 15.5 |
| 2007 | 24.0 | 3.9 |
| Average | 12.6 | 17.6 |

Notes: These numbers were calculated by the authors using the information published by Mexico's Central Bank.

## EMPIRICAL RESULTS

The variance decomposition of Mexico's monetary policy variables are reported in Table 2 and Table 3. In both tables, we report point estimates with standard errors in parentheses. The standard errors are calculated using 2,000 bootstrap simulations. Table 2

reports the variance decomposition of the accumulated balances, while Table 3 reports the variance decomposition of the interest rate.

Before examining the impact of remittances on monetary policy, we first review the impact of the other variables on monetary policy. We need to check the plausibility of our model in identifying monetary policy actions. Given Mexico's Central Bank commitment to control inflation, we should be particularly interested in the percentage of the forecast error variance in monetary policy that is explained by the inflation gap. From the fifth column of Table 2 we see that the inflation gap consistently explains a significant portion of the variance in accumulated balances (about 29 to 36 percent).

We can also see the importance of the exchange rate in the fourth column of Table 2. The exchange rate explains about 13 percent of the variation in accumulated balances. In the inflation-targeting context the central bank may react to the exchange rate in order to offset inflationary exchange rate shocks. It is also important to notice the relatively small percentage of the variance in accumulated balances that is explained by the output gap. The output gap explains from 6 to 7 percent of the variance in accumulated balances. This suggests that Mexico's Central Bank focuses mostly on price control when conducting monetary policy. One of our main interests is on the impact of remittances on monetary policy. The second column in Table 2 reports the percentage of the forecast error variance that is explained by remittances. Remittances seem to explain from 7.8 percent of the variance of accumulated balances after 12 periods to 6.9 percent after 36 periods.

## TABLE 2. VARIANCE DECOMPOSITION OF ACCUMULATED BALANCES OF CREDIT INSTITUTIONS

| Horizon | usi | r | ygap | qgap | pgap | b | i |
|---------|-----|-----|------|------|------|-----|-----|
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 12 | 4.9 | 7.8 | 6.4 | 13.5 | 29.0 | 28.0 | 10.4 |
|  | (4.5) | (4.2) | (4.4) | (5.9)* | (3.5)* | (7.5)* | (5.2)* |
| 24 | 5.0 | 7.4 | 6.9 | 13.0 | 37.0 | 18.7 | 12.0 |
|  | (5.8) | (4.7) | (5.2) | (5.9)* | (4.3)* | (8.1)* | (6.1) |
| 36 | 5.1 | 7.2 | 6.9 | 12.8 | 36.0 | 18.6 | 13.3 |
|  | (7.2) | (5.5) | (5.8) | (6.7)* | (4.8)* | (9.0)* | (7.3) |

Notes: These numbers are point estimates and standard errors are in parenthesis. 2,000 bootstrap simulations are used to construct the standard errors. A * indicates that the point estimate is at least twice as large as its standard error.

Table 3 reports the variance decomposition of Mexico's interest rate. Contrary to the accumulated balances, for which Mexico's Central Bank sets a specific objective, the interest rate is determined by the market. By adjusting the accumulated balances, Mexico's Central Bank only sends a signal to the market that it would like to see a higher or lower interest rate. Hence, it is not surprising that the inflation gap explains a smaller fraction of the forecast error variance in the interest rate, than was the case for the accumulated balances. In this case, the inflation gap only explains from 4 to 11 percent of the variation in Mexico's interest rates. Moreover, we fail to find significance for several

of the point estimates. On the other hand, we still have an important percentage of the variance being explained by the exchange rate (16 to 25 percent). As with the case for the accumulated balances, we see that remittances flows explain about 7 percent of the variance in interest rates.

### TABLE 3. VARIANCE DECOMPOSITION OF MEXICO'S INTEREST RATE

| Horizon | usi | r | ygap | Qgap | pgap | b | i |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 12 | 11.5 | 7.6 | 5.9 | 25.0 | 3.9 | 19.6 | 26.5 |
| | (10.3) | (7.5) | (6.7) | (10.1)* | (4.4) | (7.6)* | (10.2)* |
| 24 | 9.4 | 7.9 | 5.5 | 18.1 | 10.6 | 15.5 | 33.0 |
| | (10.7) | (7.4) | (6.4) | (9.0)* | (5.3)* | (7.5)* | (12.2)* |
| 36 | 8.8 | 7.5 | 5.8 | 16.3 | 8.4 | 16.4 | 36.8 |
| | (11.3) | (7.7) | (6.7) | (10.0) | (5.5) | (7.8)* | (13.1)* |

Notes: These numbers are point estimates and standard errors are in parenthesis. 2,000 bootstrap simulations are used to construct the standard errors. A * indicates that the point estimate is at least twice as large as its standard error.

While variance decompositions are informative, they do not provide information about the direction of the impact of remittances on monetary policy. The impulse response functions can provide that information. The impulse response functions of Mexico's monetary policy variables after a shock to remittances are reported in Figure 2 and Figure 3. In both figures the upper and lower bounds represent a two-standard deviation confidence interval. The confidence interval is computed via Monte Carlo simulation with 2,000 draws. Figure 2 shows the response of the accumulated balances to a shock in remittances, while Figure 3 shows the same for the interest rate. The shock corresponds to one standard deviation of remittances. Results in Figure 2 suggest that there is a negative response of the accumulated balances (restrictive monetary policy) to a shock in remittances. The response of accumulated balances to remittances is significant about 3 periods after the shock and then dies out gradually and remains very close to the zero line.

The response of the interest rate is positive at first, and then turns negative after four periods. However, the confidence interval always include zero and therefore, we fail to find significance. Hence, we have some weak evidence that Mexico's Central Bank adopts a more restrictive monetary policy stance after shocks to remittances. As we showed above, this result depends on the selection of the monetary policy variable, and it is only significant for the case of the accumulated balances. However, even in the case of the accumulated balances the response is significant only for a short period.

**FIGURE 2. IRF OF THE ACCUMULATED BALANCES AFTER SHOCK IN REMITTANCES**
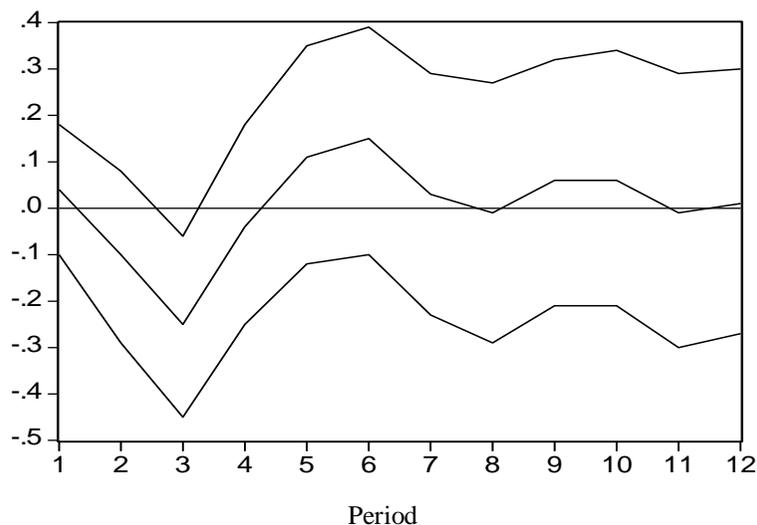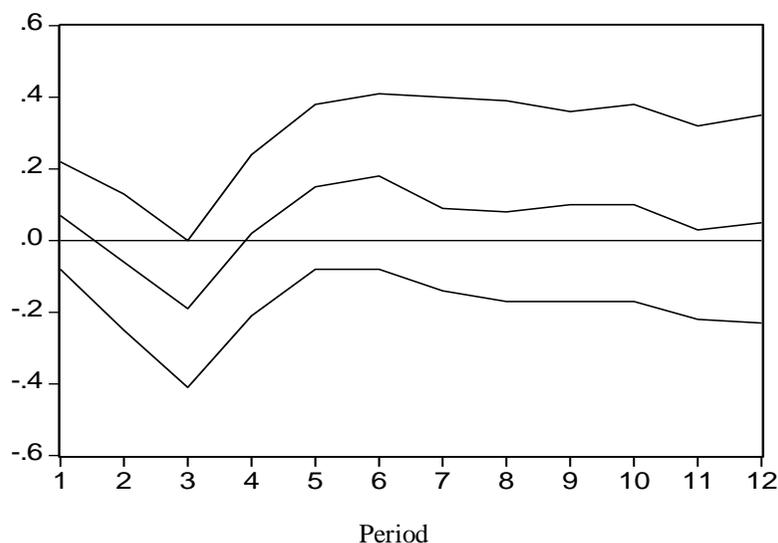


Period

Notes: Confidence intervals are computed via Monte Carlo simulation with 2,000 draws. Ranges indicated a two-standard deviation confidence interval. A Cholesky decomposition is used to orthogonalized the residuals.

**FIGURE 3. IRF OF MEXICO'S INTEREST RATE AFTER SHOCK IN REMITTANCES**
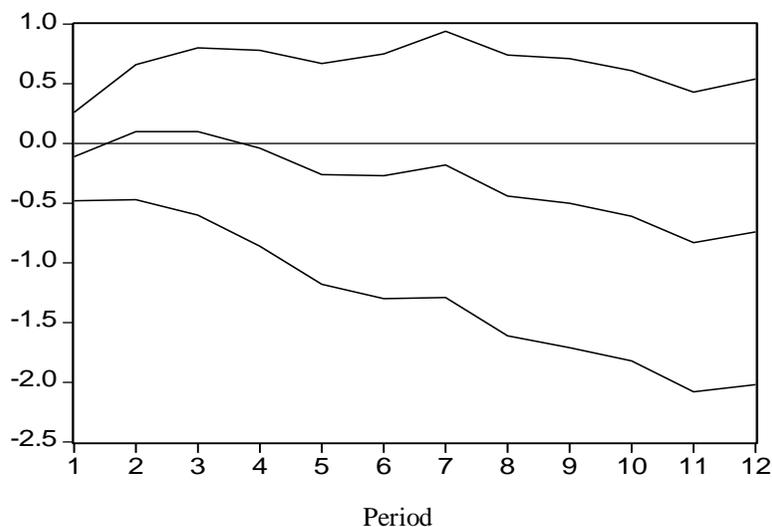


Period

Notes: Confidence intervals are computed via Monte Carlo simulation with 2,000 draws. Ranges indicated a two-standard deviation confidence interval. A Cholesky decomposition is used to orthogonalized the residuals.

**ROBUSTNESS**

We conduct a series of robustness tests with respect to our estimations. First, while it is conventional to use a Cholesky decomposition to obtain orthogonal residuals, this decomposition is not unique, which means that results depend on the ordering of the variables. In order to avoid issues related to the ordering of the variables, we also estimate generalized impulse response functions, following Pesaran and Shin (1998). The impulse response functions that are obtained using this methodology are not susceptible to changes in ordering.

The generalized impulse response functions are presented in Figure 4 and Figure 5. As it is clear from the figures there are just a few differences between the generalized impulse response functions and the results from the traditional Cholesky decomposition. For instance, the negative response of the accumulated balances is somewhat smaller and the response of the interest rate is smoother in the generalized impulse responses. In any case responses seem to be consistent across methodologies; we have a negative response of the accumulated balances that is significant for a short period and non-significant response from the exchange rate.
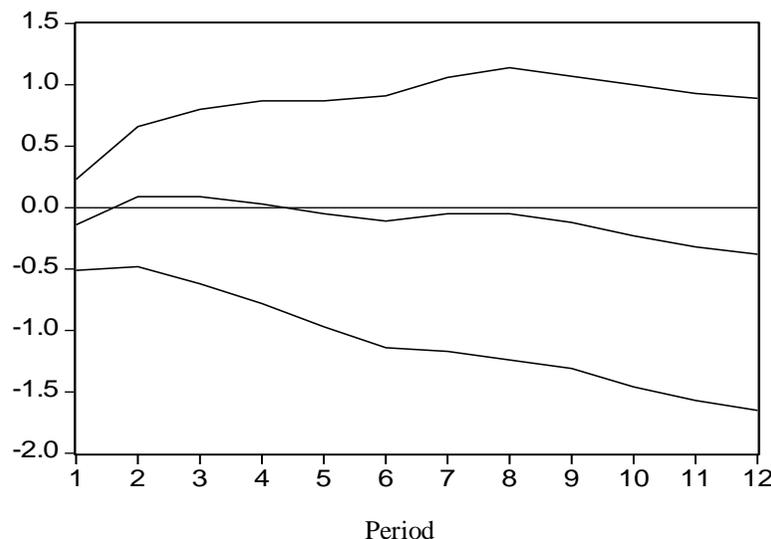
**FIGURE 4. GENERALIZED IRF OF THE ACCUMULATED BALANCES AFTER SHOCK IN REMITTANCES**



Period

Notes: Confidence intervals are computed via Monte Carlo simulation with 2,000 draws. Ranges indicated a two-standard deviation confidence interval. We use the technique introduced by Pesaran and Shin (1998) to estimate the generalized impulse response functions.

Finally, as an additional robustness test we limit our sample to the period 2000 - 2008. As discussed, by Cañas *et al*. 2007 it is possible that, although data on remittances are available before 2000, they are more reliable starting on that year. Results are also consistent for this shorter period.[4] Once again, the response of the accumulated balances is significant but short lived, while the response of the interest rate is not significant.

**FIGURE 5. GENERALIZED IRF OF MEXICO'S INTEREST RATE AFTER SHOCK IN REMITTANCES**



Period

Notes: Confidence intervals are computed via Monte Carlo simulation with 2,000 draws. Ranges indicated a two-standard deviation confidence interval. We use the technique introduced by Pesaran and Shin (1998) to estimate the generalized impulse response functions.

**CONCLUDING REMARKS**

Mexico is the largest recipient of workers' remittances in Latin America. Remittances are already the equivalent of one third of wage earnings in the formal sector of the Mexican economy, and in some states, workers' remittances exceed formal wage earnings. Moreover, remittances are the third source of foreign currency in Mexico after oil exports and Maquiladoras. Given the magnitude of remittances in Mexico, it may be the case that Mexican monetary authorities are taking these flows into account when selecting their monetary policy stance. Overall, our results indicate that Mexico's monetary policy variables do not respond to remittance shocks. However, there is some evidence indicating a slim response of monetary policy to remittance shocks if the accumulated balances are taken as the monetary policy variable. But even in that case the response is short lived.

Our findings suggest that Mexico's Central Bank does not actively respond to remittance flows. This result supports the stated commitment of Mexico's Central Bank to maintain an inflation target and a flexible exchange rate. In that sense our results are in line with some of the previous literature that states that Mexico has maintained an inflation targeting regime and a flexible exchange rate during the previous decade.

**ENDNOTES**

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[1] In fact, Woodruff and Zenteno (2001) find that remittances are responsible for almost 20% of the capital invested in microenterprises in urban Mexico.

[2] Chami *et al.* (2006) provides a discussion of optimal monetary policy in the presence of remittances.

[3] Arguably, the impact of remittances on monetary policy decisions in smaller countries with large remittance inflows (e.g. Dominican Republic, El Salvador, Nicaragua) may be stronger. Unfortunately, long time series at the monthly frequency are not available for these countries. Mexico has been collecting monthly data on remittances, at least since the mid 1990s.

[4] Results are available from the author upon request.

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