Business Cycles and Remittances: A Comparison of the Cases of Turkish Workers in Germany and Mexican Workers in the US

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Business Cycles and Remittances: A Comparison of the Cases of Turkish Workers in Germany and Mexican Workers in the US

by

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1. Introduction

Growing rapidly after the 1970s, workers' remittances have become an increasingly important channel for meeting external financing needs of developing countries, eventually proving to be one of the largest sources of such financing (Ratha, 2003; Spatafora, 2005). With steady increases after 1990 (with the exception of a slight reduction in 1998), total remittance receipts by developing countries reached 116 billion dollars in 2003, corresponding to more than 1.5% of their total GDPs as a group. In 2004, this amount was estimated to stand at 126 billion dollars, representing an almost 50% increase over its 2001 value (Maimbo and Ratha, 2005) and this rising trend is expected to continue in the years ahead.

The significance of this magnitude aside, remittances are unilateral transfers that do not create any future liabilities such as debt servicing or profit transfers, and are generally considered a less volatile, hence more dependable, source of funding than private capital flows and FDI (Ratha, 2003; Buch and Kuckulenz, 2004). In the literature, funds repatriated by migrant workers remittances are often argued to have a tendency to move countercyclically with the national income (GDP) in recipient countries. In other words, they would be expected to move in the opposite direction with the business cycle (or cyclical fluctuations in GDP),[1] increasing whenever there is a stagnation or economic crisis in the home countries of migrant workers and falling whenever home country economies do well, with the economic growth picking up. This is natural since migrant workers typically leave family members behind, and feel an urge to increase their support to family during down cycles of economic activity back home so as to compensate for lost family income due to unemployment or other crisis-induced reasons. Yet, as shown by a considerable number of studies in the existing literature, the decision to remit is a complex phenomenon involving other factors than the motivation to help finance current (as opposed to future) consumption spending of family members and relatives back home (see, for example, Russel, 1986).

Given that different variables driving the remittance behavior are differently influenced by the state of economic activity over the business cycle, it is conceivable that remittances may be procyclical or even acyclical with the output in some of the recipient countries (Sayan, 2006). The relative returns to savings of migrant workers, for example, may converge or diverge as home country interest rates react to downturns and upturns, affecting the risk-adjusted difference between home and host country interest rates and hence the remittance behavior. The effects on remittance flows may be in either direction depending upon the nature of changes in relative returns to savings and whether investment motive behind remittances is stronger than the consumption smoothing motive for the migrant workers from the country in question.

When they are countercyclical to home country business cycles, remittances would serve as a macroeconomic stabilizer that helps smooth out large fluctuations in the national income observed over different phases of the business cycle. When they are procyclical, on the other hand, they may act as a destabilizing force by amplifying cyclical fluctuations in GDP. In such a case, increased remittance

[1] Business cycles may essentially be viewed as recurring episodes of slow down in economic activity (or recession), stagnation/crisis, growth and boom. More formally, we define business cycles as periodically observed ups and downs of GDP. An upturn is characterized by increasing rates of economic growth (or GDP growth) with increased volume of economic activity leading to drops in unemployment rates, whereas a downturn is characterized by falling rates of economic growth and hence a slow down in economic activity causing an increase in unemployment.

receipts would further boost growth rates during or shortly after economic booms but any parallel reductions in remittances during the times of sharp output drops would deepen the home country crises even further, contributing to economic instability and lowering the credibility of recipient countries at times of greater need for external funding.

Aside from such effects on the macroeconomic stability of the home country, whether remittances are procyclical or countercyclical have potentially significant and opposite implications for poverty, depending upon whether family members that migrant workers left behind belong to poorer sections of the society: In the case of countercyclicality, remittances would be expected to contribute to poverty alleviation, whereas in the case of procyclicality the decline in remittances during the times of economic crises could elevate the level of poverty. It is therefore important to know whether remittances respond positively or negatively to movements of GDP over the business cycle for different recipient countries.

In addition to the effects of home country cycles on transfer behavior of migrant workers, remittances should also respond to the state of host country economies, since the level of economic activity and the associated level of wages and unemployment rates would directly have a bearing on the saving potential and fund transfer capacity of existing migrant workers, and might affect the inflows of new migrants. Thus, even if remittances move countercyclically with the output in the home countries of migrant workers, the cycles in home and host country economies may be moving in the same direction simultaneously, thereby making it difficult for migrant workers employed in a crisis-struck host economy to help out family members facing similar conditions back home. Furthermore, such a similarity in the direction of cyclical movements in home and host country economies may be due to correlated output movements, rather than accidental. Naturally, the potential for such co-movements between outputs of developed host country and developing home country economies would be higher, the stronger the degree of integration between them is. Besides, the remittance flows themselves may contribute to the transmission of the effects of a contraction in the host economy to the recipient country through the reductions in the amounts remitted by migrant workers in a synchronized fashion or with a phase difference, even though this is a largely overlooked aspect of remittance behavior in the literature (Sayan, 2004; Sayan, 2006).

In this paper, we study cyclical characteristics of remittances sent home by Mexican workers living in the USA and Turkish workers living in Germany and explore the implications of these cyclical characteristics for poverty in Turkey and Mexico. We also consider the effects of certain policy changes in the host countries and discuss whether these effects are strong enough to alter cyclical characteristics of remittances in any way. More specifically, the paper aims to identify whether remittances sent home by Mexican and Turkish workers are

i) countercyclical or procyclical with the respective output in their home countries
ii) are countercyclical or procyclical with the fluctuations in the outputs of the host countries

and whether

iii) macroeconomic developments and policy changes in host countries could affect home country economies and the amounts remitted

by analyzing the remittance behavior of Mexican workers in the USA and Turkish workers in Germany over different phases of business cycles in respective home and host country economies based on time series data. We then discuss poverty implications of remittances received by these two countries in light of our findings.

Seeking answers to these questions within the context of the experience of countries we consider is instructive for a number of reasons. Mexico and Turkey similarly rank among the major recipients of remittances in the world. Both countries have sent considerable numbers of migrant workers to the host countries we consider over the past decades. Furthermore, the USA and Germany are not only the most popular respective destinations for migrant workers from Mexico and Turkey, but also the leading trade partners for them. Yet, each home country in our study has different arrangements for economic integration with the country where majority of their migrant workers are employed. Mexico is currently more strongly integrated to the USA through NAFTA, as compared to the degree of integration between Turkey and Germany, through the EU. This differing degree of integration naturally affects the potential of developments in host country economies to affect home country economies and hence remittance flows, making these two cases interesting for the purposes of this study.

The discussion in the rest of the paper is organized as follows. The next section provides a brief panorama of migration patterns from two countries of origin we consider to the respective countries of destination over the past decades to help the reader develop a better understanding of the relevance of the questions tackled in our study. Section 3 describes the methodological approach and data employed in the study. Section 4 presents results about the cyclical characteristics of remittances received by Mexico and Turkey. Section 5 discusses the effects of specific policies introduced by host countries and Section 6 extends the discussion to poverty implications of remittances. Section 7 concludes the paper.

2. Overview

Turkey has so far sent millions of workers to the rest of Europe starting from the early 1960s (especially to Germany but also to other countries like Belgium, France and the Netherlands which later became members of the European Union). The country has maintained historically strong economic ties with Germany and the other EU member states in other areas as well, including an Association Agreement signed with the European Economic Community (EEC), the initial arrangement for the European economic integration, in 1963. Still, the migration of Turkish workers into the EU area has slowed down considerably after the 1980s due to the restrictions placed by the destination countries.[2]

The link between Turkey and the EU became even stronger (particularly in the area of trade) with the 1996 Customs Union Agreement between the two parties but this agreement provided only for limited mobility of Turkish citizens, predominantly professionals, within the EU area. Turkey is now a candidate for full membership in the EU, but there still is talk about special provisions to restrict mobility of Turkish workers into Germany and the larger EU area. Considering the decades-long history of integration efforts between these countries, the Turkish-German migration case can be regarded as a natural laboratory to answer some of the questions raised in this paper.

Unlike the gradually evolving process of Turkey's accession into the EU, Mexico's membership was simultaneous with the formation of NAFTA. Together with the US and Canada, Mexico joined NAFTA as a founding member in 1994 and NAFTA itself has not followed a lengthy, step by step evolution from

[2] While the EU distinguished itself as a stronger form of economic integration by allowing for full labor mobility between member states, it has typically tried to restrict the inflow of workers from non-member countries since its formation. Turkish workers have been subjected to the same restrictions as workers from other non-member countries following the evolution of the EEC into the EU.

a free trade area to an economic community and eventually to a full-fledged economic and political union like the EU. Despite the high degree of integration between member states with respect to trade and investment flows, NAFTA did not necessarily provide for increased labor mobility and the US continued to patrol the border against illegal immigration attempts by Mexicans. In fact, one reason often given for the tight security measures at the border was the need to maintain the wage differentials so as to facilitate a steady flow of trade and investment between the two countries. Yet, the Mexican worker population in the US has continued to grow to date.

Today, nearly 2.5 million Turks reside in Germany and almost 10 million Mexicans in the US. Turkish migrants account for 28.2 percent of the stock of foreigners in Germany and Mexican migrants for 29.5 percent in the United States (OECD, 2002). At the first look, the Turkish-German and the Mexican-American migrations seem very similar in the sense that both predominantly involve unskilled labor immigration. However, there are quite a few differences: First, when compared to the Turkish-German migration, the Mexican-American migration has a longer and more farm based history. In the Turkish-German case, the migration of Turkish workers was initially triggered by the post-World War 2 reconstruction and development efforts that increased the need for cheap labor in Germany. In the Mexican-American case, on the other hand, it was either the increased labor demand in war times or the peace-time labor shortages in not-so-popular industries such as agriculture with low wage rates. Second difference is the strikingly high level of illegal immigration observed in the Mexican-US case –facilitated by the 2,000 mile border shared by these two countries. Last but not least, the Turkish-German migration does seem to saturate with the emergence of a Turkish middle class in Germany with weaker ties to relatives left behind, whereas there is no such tendency in the Mexican-American case yet. The impact of this on the magnitude and the nature of the remittance flows remains to be an open question that we intend to discuss in the rest of the paper.

3. Methodology and Data

To analyze the response of remittances flows to recurring episodes of recession, stagnation/crisis, growth and boom in each recipient country, a benchmark is needed to decide when the economy is actually in one of these phases. Since a country's national output itself typically follows a continuously growing long-run trend over time, a cyclical upturn must not be confused with this upward trend indicating the long-run growth path of the economy. Identifying stylized facts of business cycles (i.e., the phase that the economic activity is going through during the period under consideration) requires that the long-run trend within time series data on output be removed first. Once this long-run trend is removed, the remaining fluctuations observed would point to cyclical upturns and downturns corresponding to recession, stagnation/crisis, growth and boom episodes that the economy in question goes through during different periods of time. If the same procedure is repeated to detrend the real (i.e., inflation adjusted) remittances series, one could observe cyclical upturns and downturns of real remittances and analyze any co-movements between remittances and output.[3]

[3] Formally, detrending is what makes separating fluctuations (cyclical components) around the trend of each time series, allowing examination of the statistical properties of co-movements of deviations of output and real remittances from their respective trends (Lucas, 1977; Kydland and Prescott, 1990).

We work with series in natural logarithms by letting y_t^H represent the home country output in period t where $y_t^H \in$ {Turkey, Mexico}, and y_t^D denote the destination (or host) country output in period t where $y_t^D \in$ {Germany, US}. In our notation, r_t stands for the corresponding time series of total real remittances sent home from the destination country.[4]

If cyclical components observed in the (detrended) remittance receipts, r_t, and the recipient (or home) country output series, y_t^H, tend to move in the same direction over time, then remittances are said to be procyclical with the output. That is, remittances respond to home country output by moving in the same direction, increasing when output increases and decreasing when output falls. If they move in opposite directions, on the other hand, then remittances are said to be countercyclical with the output, increasing when output decreases (as would be the case during a recession or crisis) and decreasing when output increases during a growth or boom episode.

We start by detrending each series we consider by using a polynomial filter[5] and test the stationarity of the resulting cyclical components.[6] Afterwards, we explore the pairwise relationship between the cyclical components of remittances and output series under consideration.[7]

For each country, respective output series used in our analysis was chosen in light of the national income accounting conventions that define gross national product (GNP) as gross domestic product (GDP) plus net factor income from abroad (NFI). Since NFI includes net remittance receipts, home country's GDP and host country's GNP series leave out remittances sent home by migrant workers in the host country in question. Thus, GDP for home countries and GNP for host countries would be the more appropriate output (and real income) measure to analyze the cyclical behavior of real remittances sent home by migrant workers against the home and host country outputs (Sayan, 2004).

Accordingly, we use real gross national income (GNI) for Germany and GDP volume index for Turkey obtained from the International Financial Statistics published by the International Monetary Fund and total remittances data obtained from the Turkish Central Bank to analyze the case of remittances sent by Turkish workers in Germany. We convert monthly remittances figures in nominal US dollar terms into quarterly real values by using the US price deflators and separate remittances from Germany from the rest by using the weights reflecting share of Turkish workers in Germany in the total number of migrant

[4] Obviously, cyclical upturns or downturns at both ends could affect not only the average amount remitted per migrant worker, but also the total number of existing migrant workers in a country of destination, as well as the tendency of others to migrate into this country. Our time series data, however, does not distinguish between the number of existing migrants (a stock variable) and those who migrated during the period under consideration (a flow variable), nor does it distinguish old migrants who die, become invalid or retire in the country of destination.

[5] There is an extensive literature on the decomposition of economic time series into trend and cyclical components. Although it is not as widely used by economists as the filter developed by Hodrick and Prescott (1997), polynomial filters are useful detrending devices, often producing similar results to the Hodrick-Prescott (HP) filter (Sayan, 2006). For basic information about polynomial filters, see Pollock (2005) and for a recent application using polynomial filters, see Lucke (2005).

[6] Cyclical component series must be stationary for further analysis. In other words, each series we work with needs to be *trend-stationary* (TS). The series is said to be *difference-stationary* (DS) if it cannot in general be made stationary by the removal of a deterministic trend. Then, the series calls for first-differencing before processing. To test the stationarity of the detrended series, we use Augmented Dickey Fuller (ADF) tests.

[7] Technical details of our analysis are given in the appendix.

workers from Turkey as in Sayan (2004).[8] We seasonally adjust all series covering the period between 1987:1 and 2003:3.[9]

For the US-Mexico case, we use the Mexican GDP in 1993 pesos, the US GNP in 2000 dollars and nominal remittances (in US dollars) obtained from the web sites of the Instituto Nacional de Estadística Geografía e Informática (INEGI), the Bureau of Economic Analysis under the US Department of Commerce and the Central Bank of Mexico, respectively. All series cover the period from 1980:1 to 2005:2. Again, we convert remittances reported in nominal US dollar terms into real values by using the US GNP deflator with the base year 2000 to analyze their co-movements with the US output. For estimations involving the Mexican output, we convert nominal US dollar values of remittances into pesos by using the exchange rates reported by the Central Bank of Mexico first, and obtain their real values by using the Mexican GDP deflator with the base year 1993. As the last step, we seasonally adjust all resulting series.

4. Cyclical Characteristics of Remittances

4.1. Turkish Remittances

The stationarity tests we conducted for German real output, Turkish real output and real remittance receipts of Turkey from Germany indicated that all original series were non-stationary before detrending. These non-stationary series were seasonally adjusted first and detrended with the polynomial filters by using the values in logarithms.[10] The coefficients for estimated trends are given in Table 1. The cyclical components obtained after removal of trends were checked and all were found to be stationary as required.

Table 1. Estimated Trends for the Turkish and German Outputs and Real Remittance Receipts of Turkey from Germany (*t*-statistics in parentheses)

	Constant	t	t^2	t^3	t^4	t^5	R^2 [$Adj.R^2$]
y_t^H	4.333650		0.000630	-0.000014	8.75E-08		0.950
	(378.43)	--	(8.54)	(-5.10)	(3.50)	--	[0.948]
y_t^D	1.190305	0.019313	-0.000341	2.38E-06			0.968
	(110.42)	(13.55)	(-6.78)	(4.76)	--	--	[0.967]
r_t	1.319344		0.000495			-2.19E-09	0.330
	(15.34)	--	(5.09)	--	--	(-5.57)	[0.306]

Cyclical components of the Turkish GDP and the remittances are given in Figure 1. The solid line and the left hand side axis stand for the real remittances of Turkish workers living in Germany whereas the

[8] Germany is by far the most important destination for migrant workers from Turkey indeed, and hosts about 60 percent of all Turkish workers abroad.

[9] The end of the sample period was determined to be the third quarter of 2003 since the classification of remittances and tourism receipts was changed by the Turkish Central Bank after this period.

[10] The best fitting polynomial trend was picked by examining the variable by variable and overall fit of the polynomial regressions and the stationarity of the cyclical components. Concurrently, AIC and SCI values after Dickey Fuller regressions were used, with smaller values considered to be better.

dashed line and the right hand side axis for the Turkish GDP. The dips in the dashed line clearly mark drops in the Turkish output starting with the contraction experienced shortly before the first Gulf Crisis between the US and Iraq, a neighbor and a major trade partner for Turkey, as well as the two major crises that hit the Turkish economy in 1994 and then in 2001 following the Marmara earthquake of 1999. Broadly speaking, if the remittances repatriated by Turkish workers living in Germany were countercyclical to the business cycles in Turkey, one would expect to observe increases in the amounts remitted concurrently with or shortly after each dip in the dashed line, since workers would then be expected to increase their support to family members they left behind so as to prevent sharp drops in their living standards due to the slow down in economic activity or crises in Turkey. Alternatively, Turkish workers' remittances could have responded procyclically to the developments in the Turkish economy by considering other factors such as the increasing riskiness of funds placed in Turkish assets that would negatively affect the returns to savings invested in Turkey relative to returns on savings kept in Germany. Yet another possibility would be the lack of a systematic relationship between remittances and output cycles in Turkey in which case we would talk about acyclicality of remittances.

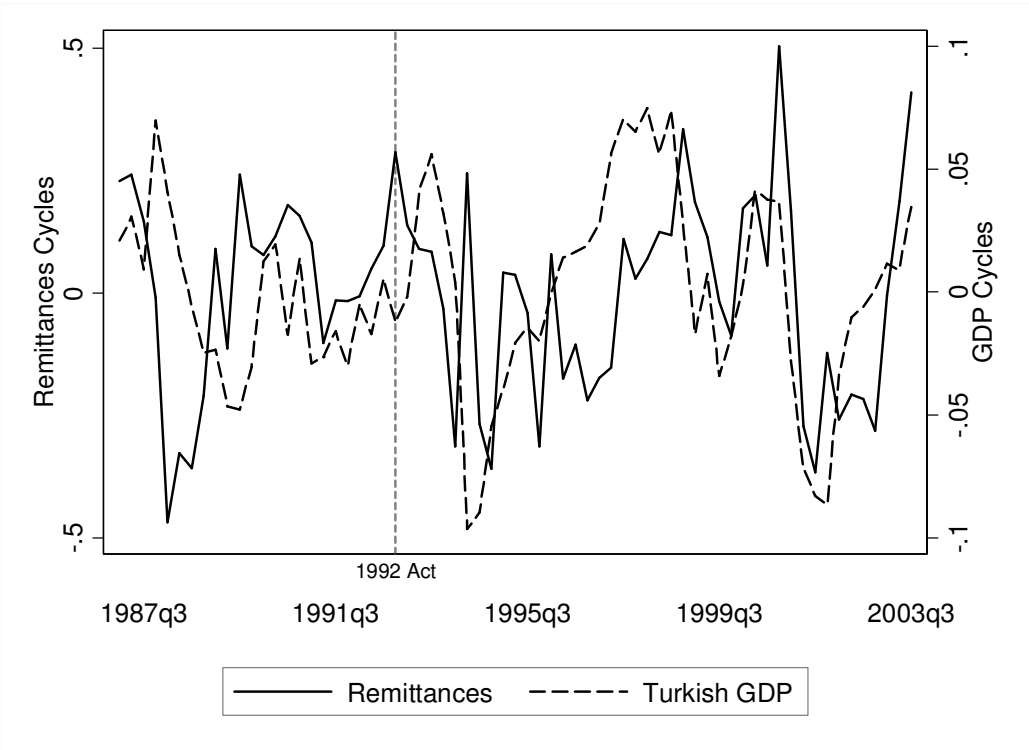

Figure 1. Cyclical Components of the Turkish GDP and the Remittances – 1987:1-2003:3

It is indeed difficult to decide on the nature of cyclical behavior of remittances by relying solely on a visual comparison of the lines in Figure 1. Sharp drops in remittance receipts observed in 1994 and in the aftermath of 1999 and 2001 hint a procyclical behavior, whereas the significant rise in the early 1990s seem to imply countercyclicality. In order to formally decide whether Turkish workers' remittances tend to be countercyclical or procyclical to the business cycles in Turkey, we use the values of cross correlation coefficients reported in Table 2.

Table 2. Cross Correlations between Cyclical Components of the Turkish Real GDP and Real Remittances from Turkish Workers in Germany

Lag, i	cy_t^H , cr_{t-i}	cy_t^H , cr_{t+i}
0	0.335*	
1	0.216	**0.360***
2	0.001	0.316*
3	-0.065	0.244
4	-0.009	0.208
	Memorandum	
*Volatility***	Turkish Output: 5.1	Remittances*:* 24.7

* Coefficients that are statistically significant at 5% significance level.
** Percentage standard deviation of the cyclical component of the series.

Given the positive sign and statistical significance of the contemporaneous correlation coefficient, remittances sent from Germany to Turkey appear to move in the same direction as the Turkish output –or to be procyclical. In other words, Turkish workers in Germany tend to pay attention to developments in the Turkish economy for reasons other than an altruistic desire to help family members and relatives back home to smooth their consumption. While contradicting findings in a number of studies in the existing literature where panel data evidence obtained for groups of remittance receiving countries, this result is consistent with time series evidence previously obtained for Turkey and some other countries (see Sayan, 2006 for more on this).[11] Given the location of the highest significant correlation coefficient of 0.360, the results in Table 2 further indicate that remittances follow the business cycle in Turkey by a lag of one quarter. This finding is similar to the one in Sayan (2006), and provides stronger evidence regarding the nature of procyclicality than in Sayan (2004).

Based on these results, one can conclude that there is a strong co-movement between remittances Turkey receives from Germany and Turkish output, implying that Turkish workers in Germany closely watch developments in Turkey and respond to the changes in economic activity in the Turkish economy by adjusting the amounts transferred within the next quarter in the same direction. Then, it would be appropriate to use the phrase "when it rains, it pours" for the Turkish economy: Remittances would increase whenever the output (and hence household income) goes up, further boosting the income increase. Yet, this behavioral pattern would prove to be a challenge to be dealt with at the times of downturns, since the following decline in remittances would contribute to deepening of recessions. In fact, Turkey suffered an additional blow, when the 1990s' rising trend of remittances turned down following the severe economic crises that the country faced in 1999 and the early 2000s (Ratha, 2003).

One possible explanation for this procyclical behavior could be a direct and synchronous co-movement between output cycles in Germany and Turkey, coupled with the procyclicality of Turkish remittances to the German business cycle. If both conditions are satisfied, remittances from Germany may appear to be procyclical with the Turkish output, even if the latter is not really the driving force behind remittances.

[11] Procyclicality of remittances from Turkish workers in Germany with the business cycles in Turkey seems to be a robust result independent of whether the detrending technique used in extracting the cycles is Hodrick-Prescott as in Sayan (2004) or polynomial filtering as in Sayan (2006).

The first condition would be met if the level of economic activity in Germany affects that in Turkey because of the strong ties (particularly through trade) between the two economies. It is conceivable, for example, that a downturn in Germany might trigger an economic slowdown in Turkey. If there is such a co-movement and migrant workers tend to remit less during a slowdown in economic activity in Germany (i.e., if the second condition also holds[12]), then Turks working in a crisis-struck Germany would have difficulty transferring additional funds to Turkey which experiences its own crisis. Then, remittance receipts of Turkey from Germany would fall despite the crisis in Turkey. Likewise, when the German economy is on an upturn, the resulting increases in the incomes of Turkish workers may enable them to save and transfer more, leading to increased remittances back home when they are less needed –due to the synchronously experienced increase in economic activity in Germany and Turkey alike. The validity of this hypothesis could be tested by studying the nature of any co-movements between business cycles in Germany and remittances from Turkish workers, and between business cycles of both countries separately. Table 3 and Table 4 present cross correlation coefficients calculated for this purpose.

Table 3. Cross Correlations between Cyclical Components of the German Output and Real Remittances from Turkish Workers in Germany

Lag, I	cy_t^D , cr_{t-i}	cy_t^D , cr_{t+i}
0	-0.0911	
1	0.0084	-0.1863
2	0.1255	-0.1933
3	0.2549*	-0.1902
4	0.3530*	-0.2164
	Memorandum	
*Volatility***	German Output 2.2	Remittances: 24.7

* Coefficients that are statistically significant at 5% significance level.
** Percentage standard deviation of the cyclical component of the series.

Table 4. Cross Correlations between Cyclical Components of Real Outputs in Germany and Turkey

Lag, I	cy_t^D , cy_{t-i}^H	cy_t^D , cy_{t+i}^H
0	-0.0538	
1	-0.0019	-0.0423
2	0.0292	0.0147
3	0.0916	0.0361
4	0.1634	0.0444
	Memorandum	
*Volatility***	German Output 2.2	Turkish Output: 5.1

* Coefficients that are statistically significant at 5% significance level.
** Percentage standard deviation of the cyclical component of the series.

[12] Given that the level of economic activity and the associated level of wages and unemployment rates are likely to have a bearing on the saving potential and fund transfer capacity of Turkish workers in Germany, one would normally expect remittances to be procyclical with the German output. An increase in German output would be expected to lead to a fall in unemployment rates and a rise in wages, thereby pushing up both the total number of migrant workers who could remit (due to lower unemployment rates) and the amount remitted per migrant worker (due to higher wages).

The results in Tables 3 and 4 invalidate the hypothesis described above, and establish that procyclicality of Turkish workers' remittances could not be due to the effects of developments in German economy on the level of economic activity in Turkey. In fact, both conditions for the validity of the hypothesis fail to hold: First, Turkish remittances do not appear to be procyclical with the German output, given the negative sign of the (statistically insignificant) contemporaneous correlation coefficient. Despite the presence of two significant coefficients, the results in Table 3 can best be interpreted as showing no systematic and meaningful relationship between Turkish remittances and the German output.[13] Secondly, there are no significant coefficients in Table 4, leading us to conclude that German and Turkish outputs do not move together or are acyclical. Together with the results in Table 3, this acyclicality not only rules out the hypothesis described above but it also establishes that Turkish workers' remittance dynamics are driven by developments in the Turkish economy.

Having ruled out any effects that German business cycles may have had on remittances sent to Turkey, procyclicality of these transfers with the Turkish business cycles requires alternative explanations. Sayan (2006) first pointed out the possibility that the initially countercyclical relationship between total remittances from Turkish workers in Germany may have turned procyclical over time, arguing further that total remittance receipts of Turkey might have been countercyclical prior to the crisis of 1994. Also supported by results from recent empirical work by Aydas, Metin-Ozcan and Neyapti (2005), this possibility was later established by Sayan (2006) to be consistent with empirical evidence on the cyclical behavior of Turkish remittances.[14]

4.2. Mexican Remittances

Statistical tests we employed to check the stationarity of the US real output, Mexican real output and real remittance receipts of Mexico from the US (in US dollars and pesos) indicated that the null hypothesis of non-stationarity cannot be rejected for any of the series, pointing to a random-walk process with drift.

Seasonally adjusted series were then detrended using the estimated polynomial filters by using the values in logarithms (Table 5). As we explained while we describe our data, there are two real remittances series for Mexico, one in 1993 pesos, r_t^{93}, to be used with y_t^H and another in 2000 dollars, r_t^{00} to be used with y_t^D. The results concerning the stationarity of cyclical components obtained after polynomial detrending indicate that stationarity is achieved in all cases.

Cyclical components of the Mexican GDP and the remittances are given in Figure 2. The solid line and the left hand side axis stand for the real remittances of Mexican workers living in the US and the right hand side axis for the Mexican output whereas the dashed line and the right hand side axis show Mexican GDP. Plunges in dashed line visibly mark the substantial drops in the Mexican output starting with severe recessions in 1982-1983, the infamous "Tequila Crisis" of 1995 and another recession in 2001.

[13] As interesting as it is, the lack of any visible role that can be attributed to the state of economic activity in Germany in determining the amounts remitted by Turkish workers living in this country is similar to the findings in Sayan (2004).

[14] This issue is dealt with in greater detail in Section 6.

Table 5. Estimated Trends for the Mexican and US Outputs
and Real Remittance Receipts of Mexico from the US (*t*-statistics in parentheses)

	Constant	t	t^2	t^3	t^4	t^5	t^6	R^2 [$Adj.R^2$]
y_t^H	6.821939	0.023953	-.001986	0.000073	-1.25E-06	1.02E-08	-3.18E-11	0.980
	(309.45)	(4.14)	(-4.13)	(4.23)	(-4.11)	(3.96)	(-3.84)	[0.978]
y_t^D	8.607841	-0.021001	0.002522	-0.000090	1.50E-06	-1.20E-08	3.63E-11	0.998
	(936.66)	(-8.71)	(12.60)	(-12.37)	(11.82)	(-11.17)	(10.51)	[0.997]
r_t^{93}	6.453285	0.068444	-0.001106	7.06E-06				0.964
	(121.95)	(15.46)	(-11.10)	(11.10)	--	--	--	[0.963]
r_t^{00}	5.886149	-0.026697	0.002580	-0.000055	4.97E-07	-1.53E-09		0.991
	(127.07)	(-2.99)	(4.86)	(-4.24)	(3.58)	(-2.85)	--	[0.991]

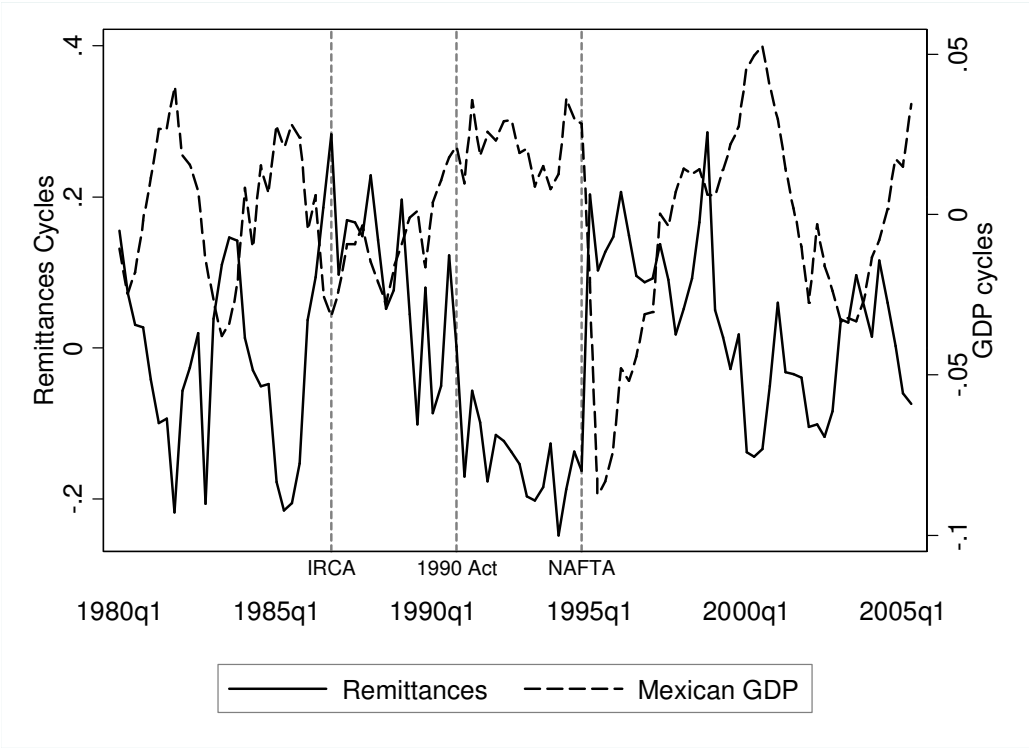

Figure 2. Cyclical Components of the Mexican GDP and the Remittances – 1980:1-2005:2

When the two series in Figure 2 are compared, what is clear to naked eye is the higher volatility of the remittances related to the output, and remittances hinting a countercyclical pattern to the business cycles in Mexico. This second observation is significant, as it indicates that there are increases in the amounts remitted concurrently with or shortly after each dip. This might point to an altruistic behavior on the part of Mexican workers in the US such that these workers increase their support to family members they left behind in order to prevent sharp drops in their living standards due to the slow down in economic activity or crises. Naturally, this observation needs to be supported by formal statistical analysis. For this purpose, we calculated the correlations between output and remittance cycles by using the cyclical components of real remittances series and its lagged values.

Given the negative sign and statistical significance of the contemporaneous correlation coefficient, remittances sent from Mexico to the US appear to move in the opposite direction as the Mexican output or be countercyclical. Given the location and significance of the correlation coefficient with the highest absolute value (0.607), results in Table 6 further indicate that remittances are synchronous with the business cycle in Mexico. These results insinuate that migrant workers from Mexico immediately increase their support to family members during down cycles of economic activity back home, to help them recover lost family income due to unemployment or other crisis-induced reasons. As such, remittances from Mexican workers have a potential to contribute to poverty alleviation.[15]

Table 6. Cross Correlations between Cyclical Components of Real Remittances from Mexican Workers in the US and the Mexican Output

Lag, i	cy_t^H , cr_{t-i}	cy_t^H , cr_{t+i}
0	**-0.607***	
1	-0.546*	-0.563*
2	-0.377*	-0.515*
3	-0.183	-0.406*
4	0.027	-0.314*
	Memorandum	
*Volatility***	Mexican Output: 2.7	Remittances: 8.4

* Coefficients that are statistically significant at 5% significance level.
** Percentage standard deviation of the cyclical component of the series.

In addition to the effects of Mexican cycles on the transfer behavior of migrant workers, remittances might also respond to the state of the economy in the US, since the level of economic activity and the associated level of wages and unemployment rates are likely to affect the saving potential and remitting capacity of migrant workers in this country.

Cyclical components of the Mexican remittances from the US and the US GNP are given in Figure 3. The solid line and the left hand side axis stand for the real remittances of Mexican workers living in the US whereas the dashed line and the right hand side axis for the US output. The dips in Figure 3 mark the significant drops in the US output starting with the severe recession in 1982-1983, the relatively mild one in the aftermath of the first Gulf Crisis in 1991 and finally the very last recession in 2001, which brought an end to the "irrational exuberance" of 1990s.

A comparison of the two series in Figure 3 hints that Mexican remittances tend to move procyclically with the business cycles in the US as expected. The validity of this last observation could be tested by studying the nature of any co-movements between business cycles in the US and remittances from Mexican workers there. Table 7 presents cross correlation coefficients calculated for this purpose.

The positive sign of the contemporaneous correlation coefficient between the cyclical components of the US output and the remittances reported in Table 7 indicates that Mexican remittances and the US output are procyclical as expected. Given that this also happens to be the highest significant correlation coefficient, we conclude that remittances are synchronous with the business cycle in the US. This result

[15] This countercyclicality must also allow remittances to serve as a macroeconomic stabilizer in Mexico (helping smooth out large fluctuations in the national income observed over different phases of the business cycle).

clearly indicates that an up cycle (down cycle) in the US economy quickly induces Mexican immigrants working in the US to increase (reduce) their transfers back home. The likely reason behind this result is the increase in remitting capacity of Mexican workers due to increasing wages and falling unemployment rates during a growth episode in the US.

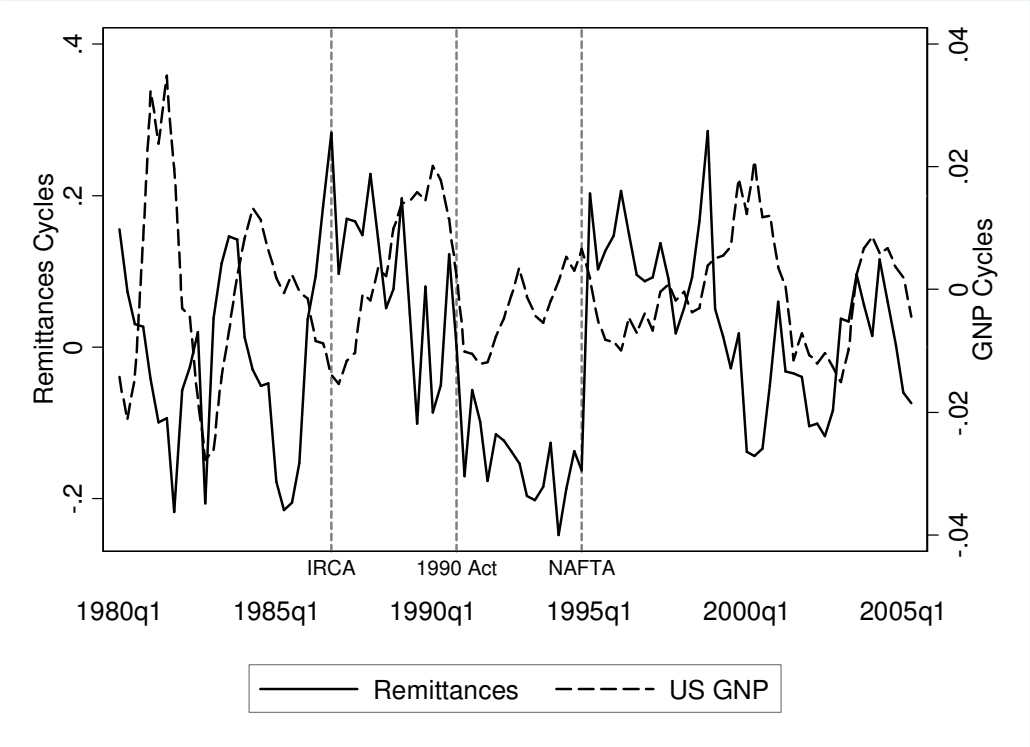

Figure 3. Cyclical Components of the US GNP and the Remittances – 1980:1-2005:2

Table 7. Cross Correlations between Cyclical Components of Real Remittances from Mexican Workers in the US and the US Output

Lag, i	cy_t^D , cr_{t-i}	cy_t^D , cr_{t+i}
0	**0.364***	
1	0.306*	0.283*
2	0.189	0.135
3	0.048	0.014
4	0.026	0.163
	Memorandum	
*Volatility***	US Output: 2.6	Remittances: 10.7

* Coefficients that are statistically significant at 5% significance level.
** Percentage standard deviation of the cyclical component of the series.

As argued before, even if remittances move countercyclically with the output in the home countries of migrant workers, the cycles in home and host country economies may concurrently move in the same direction, thereby preventing migrant workers employed in an economy hit by a crisis from helping out

family members facing similar conditions back home. A careful examination of Figure 3 reveals that this was the case in 2001 when both the US and Mexico experienced recessions at the same time. It must be noted that the remittance receipts of Mexico from the US declined in 2001, even though Mexican remittances have a countercyclical pattern with respect to the Mexican output.

Similarity in the direction of business cycles in Mexico and the US may not be accidental but result from correlated output movements. Naturally, the potential for such co-movements between outputs in developed host and developing home countries would be higher, if their economies are strongly integrated as in the case of Mexico and the US, the biggest trading partner for Mexico. The bilateral trade volume of Mexico and the United States was $275 billion (72% of total trade volume of Mexico and 11 percent of total US trade volume) in 2004. Furthermore, the FDI receipts of Mexico from the United States was $62 billion dollars (37 percent of total FDI received) in 2004. These figures point to a visibly stronger degree of economic integration between Mexico and the US than the links between Turkey and Germany, even when one accounts for differences in the relative sizes of these economies.[16]

This high degree of economic integration should certainly be expected to increase the likelihood of business cycles in the US and Mexico to move together relative to the likelihood of co-movements between the German and Turkish economies. If it is more likely for the US and Mexican economies to be on a down cycle simultaneously, then Mexican workers in the US and their families back home would be more likely to face simultaneous income losses. In other words, a down cycle in the US economy would not only limit the capacity of Mexican workers to remit, but might also increase the need of workers' families back in Mexico for those remittances to the extent that the US cycles get transmitted to Mexico.[17] In short, the differences between the degrees of integration across the pairs of countries we consider are likely to create different dynamics driving the remittances behavior. To study the validity of this view, we calculate the correlation coefficients between cyclical components of the US and Mexican outputs (Table 8).

Table 8. Cross Correlations between Cyclical Components of the Mexican and the US Outputs

Lag, i	cy_t^D , cy_{t-i}^H	cy_t^D , cy_{t+i}^H
0	0.425*	
1	0.279*	**0.489***
2	0.074	0.459*
3	0.112	0.379*
4	0.245*	0.252*
	Memorandum	
*Volatility***	US Output: 2.6	Mexican Output: 2.7

* Coefficients that are statistically significant at 5% significance level.
** Percentage standard deviation of the cyclical component of the series.

[16] Similarly Germany is Turkey's biggest trade partner with a bilateral trade volume of approximately $1.8 billion dollars (13 percent of total trade volume of Turkey) in 2004. The same year, the FDI received by Turkey from Germany stood merely at $410 million (56.1 percent of total FDI received).

[17] By comparison, the lesser degree of co-movements between German and Turkish cycles resulting from the relatively lower degree of integration between the two economies might create incentives for Turkish workers to relocate their savings between Turkey and Germany depending upon the respective rates of returns.

The contemporaneous correlation coefficient in Table 8 is positive and significant implying that the US output and the Mexican output tend to move together in the same direction indeed. Moreover, there are six other correlation coefficients that are significant with the highest two standing at 0.489 and 0.459. The location of these coefficients indicates that the Mexican output follows the US output by a lag or two.

By this evidence indicating a procyclical co-movement between the US and Mexican outputs themselves, pro-growth policies in the US would enable Mexican workers in the US to remit more, while at the same time reducing the intensity of the need for remittances to be received from the US of families left behind in Mexico since any growth in the US would also pull the Mexican economy towards higher levels of economic activity and reduced unemployment. If, however, Mexico experiences a recession for reasons not related to the state of economic activity in the US, then countercyclicality of remittances flowing from the US would help the families of Mexican workers at home, possibly contributing to poverty alleviation as well.

5. Effects of Host Country Immigration Policies on Remittance Flows

Having discussed the role of broader macroeconomic environment in the host countries, we now consider the effects of specific policies that are likely to inflict changes upon the migration patterns. It should be noted at this point, however, that it is notoriously difficult to separate the effects of individual policy changes from the changes in the macroeconomic environment of both the destination and the home countries of the workers.

A common change in the immigration policies of individual destination countries we consider was the switch from temporary employment related migration of low- or unskilled workers to programs designed to attract highly skilled labor. As the unprecedented economic growth of the 1990s powered by the development and extensive use of information technology (IT) caused labor shortages in many OECD countries in service sectors such as health and education, all temporary migration categories have been on the rise since 1998, especially in Germany, Australia, Canada, the United States and the United Kingdom.

Although this was an important policy change in and of itself, it is not likely to have a significant impact on Mexican or Turkish remittances, since the percentage of highly skilled expatriates is 5.6 percent from the former and 6.3 percent from the latter according to a new OECD study by Dumont and Lemaitre (2005). Hence, we now turn to country-specific policy changes in individual destination countries that are likely to affect remittances received by the countries sending migrant workers abroad and discuss possible effects of a number of such policy changes introduced within the time periods covered by our samples: 1992 change in the German law to facilitate acquisition of German citizenship by Turkish residents in Germany, and the introduction of two immigration acts (1986 Immigration Reform and Control Act, IRCA, and 1990 Immigration Act) in the US, together with the going into effect of NAFTA.

It must be noted that the analysis in this section uses data on total remittances sent home from the host countries to investigate the effects of immigration policy changes on the remitting behavior as before. Naturally this prevents us from distinguishing the effects of individual policies on the number of existing or incoming migrants and the average amount of remittances per existing migrant. The distinction is perhaps more important when it comes to analyzing the role of immigration reforms on remittances, since the nature of the reform may matter in different ways. Firstly, the reform may be of the amnesty-granting type. While such a reform would not necessarily affect the size of the existing stock of migrants in the host country, its effect on the remittances per migrant is likely to be favorable, since the newly acquired

legal status might increase the income of the once-illegal-migrants. Therefore, we should expect an increase in total remittances under such circumstances. Secondly, the reform may be of the family reunifying type and may lead to an increase in the number of migrants in the host country. The amount of remittances per migrant, however, is likely to fall as the immediate family members that need to be supported are now united with the migrant workers. Thus, the final effect of such a policy on total remittances will be ambiguous. Finally, an entry restricting reform should lead to a decline in total remittances due to a smaller number of new entrants, assuming no increase in flows of illegal immigrants, which certainly is not the case when it comes to migration from Mexico to the US. Stringent but not fully enforced entry regulations did indeed have no dampening effect on illegal entry by Mexicans during the 1990s. Therefore, depending upon how well the entry regulations are enforced, the total remittances may go down or not be affected in any noticeable way.

Despite the desirability of incorporating the number of migrants into our analysis, we are forced to look at the effects of immigration reforms introduced by countries of destination by using total remittances data, since quarterly data on the stock of immigrants is not available for either Germany or the US.[18] Furthermore, given that the immigration laws we consider combine the elements of different types of reforms described above, the use of total remittances data is perhaps the best alternative available.

5.1. 1992 Change in the German Law and Turkish Remittances

One development that affected the patterns of migration into the EU area during the past decade was a sharp increase in the permanent-asylum seeking migration. Net inflows of asylum seeking migrants peaked in the 1990s particularly in Germany due to the fall of the "Iron Curtain" and a number of wars and ethnic conflicts in the Balkans. In 2001 alone, nearly 90,000 asylum-seeking migrants were received in Germany, with citizens of the former Yugoslavia, Poland and Russian Federation leading the way (OECD, 2002). This development was potentially relevant to migrant workers from Turkey in Germany, since an increasing and sustained inflow of permanent migration might jeopardize the employment opportunities of the existing Turkish migrants thereby affecting the remittance flows to Turkey. Still, it is impossible to separately estimate any effects that the asylum seeking migration from Eastern European countries to Germany might have on the remittance receipts of Turkey due to the lack of data on jobs taken over from the Turkish migrants in Germany over time. Thus, our discussion in this section focuses on the developments that followed the introduction of the 1992 law facilitating the acquisition of German citizenship by Turkish residents in Germany.

The direction of the effects, if any, of this law on the remittance behavior of migrant workers from Turkey is not easy to guess. It might have facilitated the job search of Turkish migrants who choose to become German citizens and helped them find better paying and/or more secure jobs, thereby boosting their remitting potential. Alternatively, it might have weakened the ties of those who adopted German citizenship to family members left behind, reducing the intensity of their motivation to remit.

When we examine Figure 1 one more time, we observe that until the end of 1992, the cyclical components of real remittance and Turkish output series appear to be moving in a synchronized fashion but in the opposite directions, whereas after 1992 they start moving in the same direction. Thus, to see

[18] Even if such data were available, it would mostly give information about legal migrants, overlooking large numbers of illegal migrants, particularly in the US.

whether a switch might have occurred, we consider the first part of the sample separately and calculate the cross correlation coefficients.

The cross correlation coefficients between cyclical components of the Turkish real GDP and real remittances from Turkish workers in Germany for the full sample and before the 1992 law are given in Table 9. Differently from the previous tables, this table reports only the most significant correlation coefficient and the lag length at which it occurs for each sub-sample for a compact presentation.[19]

Table 9. Highest Significant Correlation Coefficients between Cyclical Components of Turkish Output and Remittances, Different Periods

Period	cy_t^H , $cr_{t\pm i}$	Number of lags (*i*)	Contemporaneous Correlation Coefficient
Full Sample	**0.360***	i=+1	0.335*
1987:1-1992:4	**-0.374***	i=+1	-0.144

* Coefficients that are statistically significant at 5% significance level.

In the first period, real remittances sent by Turkish workers residing in Germany seem to be countercyclical with the Turkish output since the contemporaneous correlation coefficient is negative. The highest significant coefficient, -0.374, is observed when *i*=+1, implying that until 1992 Turkish remittances, too, were moving countercyclically with the Turkish output, peaking one quarter after a trough in Turkish output. This insinuates that migrant Turkish workers increased their transfers shortly after the arrival of tough times in Turkey during this period. Yet, the positive sign and statistical significance of the contemporaneous correlation coefficient for the whole period indicate that remittances sent from Germany to Turkey began to move in the same direction as the Turkish output (or became procyclical) after 1992 when migrants from Turkey were given a chance to get naturalized as German citizens.

Considering the long history of migration to Germany, Sayan (2006) argued that such a switch in the cyclical characteristics of Turkish remittances may be due to a host of factors possibly including the reunification of migrant workers with immediate family members in Germany and weakening ties with other relatives back home over time, changing decisions of migrants about the length of stay in the host country and the timing of return, as well as the changing investment atmosphere in Turkey. Having located the switch from countercyclicality to procyclicality in the aftermath of the severe financial crisis of 1994, Sayan (2006) notes that it appears plausible to argue that major economic/financial crises negatively affected the migrants' confidence in the Turkish banking system and financial institutions, providing a final push for a change in their remitting behavior. Additional support to this view comes from very sharp drops observed in remittance receipts of Turkey at the beginning of the 2000s when the country was successively hit by two major economic/financial crises. Yet, the results in Table 9 indicate that the switch in cyclical characteristics of Turkish remittances might have occurred earlier than 1994. In any case, altruistic reasons to help family members and relatives back home to smooth their consumption appears to have ceased to be the main motivation behind remittances of Turkish workers in the early 1990s.

[19] For the pre-1992 period, with a sample size of 24, critical value for the significance of the correlation coefficients turns out to be ±0.392.

Regardless of when exactly the switch occurred, both the 1992 change in the German law and the crisis of 1994 seem to have contributed to the gradual weakening and eventual replacement of the countercyclical pattern of remittances that Turkey receives from Germany with a procyclical pattern, rather than suddenly causing this switch. In fact, the 1992 law marked the beginning of a process during which the number of Turkish migrants choosing to become naturalized as German citizens slowly increased over time: While only 2,618 Turks chose to take German citizenship during the period from 1972 to 1980, this number reached 60,000 in 1998. As of 2003, total number of Turks becoming naturalized Germans was 617,714. In addition, about 150,000 babies born to Turkish parents in Germany became German citizens between 2000 and 2003 (Atalay, 2005).

The 1992 law in regards to citizenship has indeed helped formalize the statue of the existing Turkish workers in the fabric of German society, weakening the bonds of those who chose to become German citizens with any relatives that might have been left in Turkey, and changing their decisions about the length of stay in Germany.[20] As a matter of fact, majority of the early Turkish migrants that came to Germany in the 1960s and the 1970s chose to stay in Germany even after retirement as revealed by a 2000 survey and a 2001 study by the Center for Turkish Studies (Zentrums für Türkeistudien). The tendency to stay in Germany over extended periods of time rather than going back clearly affected consumption patterns and savings decisions of Turkish migrants in Germany, as well as their remitting behavior. According to the statistics published by the German Federal Statistics Agency, the largest group (45.5 percent) among Turkish migrants is composed of those who lived in Germany for 20 years or more, followed by those who lived there for 8-15 years (Atalay, 2005). In other words, majority of Turks in Germany today have lived in the destination country for more than 15 years, while less than 22 percent having arrived in this country 7 years ago or less.

Given such a long average duration of stay, coupled with the previous changes in German immigration law such as the one introduced in 1974 facilitating reunification of immediate family members before the beginning of our sample period, it is natural to expect that Turkish migrants' ties with relatives they left behind would have markedly weakened as compared to the decades prior to the 1990s. Then, one can safely conjecture that helping family members smooth their consumption has already lost its rank as the primary motivation behind the remitting behavior of Turkish workers over time.

5.2. IRCA, the 1990 Act and NAFTA

We now consider the effects of the formation of NAFTA and immigration policy changes adopted in the United States on remittances receipts of Mexico during our sample period.

The Immigration Reform and Control Act (IRCA) of 1986 imposed sanctions on the US employers who knowingly employed unauthorized foreign workers and granted amnesty to unauthorized aliens who lived in the US continually since 1982, if they applied before 1988. This piece of legislation has also provided the grounds for family unifications and changed the nature of prior guest programs that were designed with only the male labor force in mind.

[20] At the same time, the inflow of new migrants from Turkey stalled due to the restrictions kept in place by Germany. The influx of cheaper and relatively skilled Eastern European workers to Germany has possibly contributed to this process by reducing potential job opportunities for Turks.

The Immigration Act of 1990 was another change in the U.S. immigration laws which increased the number of legal immigrants allowed into the United States each year. It also created a lottery program that randomly assigned a number of visas but the coverage of this law was not as broad as the IRCA.

Another major change for Mexican migrants living in the US in the post-1990 period was going into effect of NAFTA in January 1994. NAFTA did not have special provisions for increased labor mobility between Mexico and the US. On the contrary, it was expected to curb the existing tendencies among Mexicans to migrate north: Trade and investment liberalization resulting from the agreement would open up the bigger markets up north, increasing the goods and services exports and foreign direct investment in Mexico and thus reducing the incentives for Mexicans to migrate. Still, the US had to continue to patrol the border against illegal immigration attempts by Mexicans.[21]

To examine the impact of IRCA, the 1990 Act and NAFTA on the cyclical properties of the remittances, we divide the sample into four parts: One from 1980 to 1986, one from 1987 to 1990, one from 1991 to 1994 and finally one from 1995 to 2005. We repeat the trend/cycle decompositions of the series for individual sub-samples and calculate the relevant correlation coefficients between cyclical components of the Mexican real GDP and real remittances from Mexican workers in the US for each of these time periods. Statistical significance of the coefficients given in Table 10 are decided by respective critical values of ±0.365, ±0.471, ±0.471, and ±0.243.

Table 10. Cross Correlations between Cyclical Components of Mexican Output and Remittances, Different Periods

Period	cy_t^H , $cr_{t\pm i}$	Number of lags (i)	Contemporaneous Correlation Coefficient
Full Sample	**-0.607***	i=0	-0.607*
1980:1-1986:4	**-0.781***	i=0	-0.781*
1987:1-1990:4	**-0.818***	i=-3	-0.424
1991:1-1994:4	**-0.502***	i=0	-0.502*
1995:1-2005:2	**-0.523***	i=-1	-0.500*

* Coefficients that are statistically significant at 5% significance level.

The results in Table 10 show that there is no qualitative difference between these periods in the sense that the remittances sent by Mexican workers residing the US remain countercyclical to the Mexican output throughout the sample period. In other words, there is no strong indication of a change in the remitting behavior of the Mexican migrants in the aftermath of immigration related policy changes or the formation of NAFTA. Given the negative sign and statistical significance of the contemporaneous correlation coefficient in all these sub-samples, remittances sent from Mexico to the US appear to move consistently in the opposite direction as the Mexican output.

[21] In a recent study, Richter and Taylor (2005) seek an answer to whether migration from Mexico into the US is affected by the IRCA, NAFTA and increases in the US border enforcement. Using a recently compiled rural household survey data, they find that the IRCA and NAFTA both reduce the share of rural Mexicans working in the United States. Interestingly, their findings indicate that the effects of increased border patrol are contrary to expectations of a decline in illegal immigration.

While the lack of any qualitative impact from the policy changes on cyclical characteristics of remittances receipts of Mexico may seem puzzling, we suggest that the persistence of the countercyclicality of Mexican remittances is due to the failure of all immigration policy changes and NAFTA in curbing the flows of legal or illegal immigrants from Mexico into the US, implying a sustained flow of migrants who typically leave behind family members in need of remittance receipts. Even though there were considerable risks involved in crossing the border illegally or in many cases it meant to live through much difficult times in the US, emigration from Mexico did not cease due to never improving conditions in the country of origin for the poor and to the glamour of the US, which happens to be the next door neighbor. This was especially true about the 1990s during which the highest number of border apprehensions occurred. As Richter and Taylor (2005) note, the effects of IRCA, NAFTA and increased US border enforcement on the US-bound migration from Mexico have been much smaller than that of migration networks.

6. Poverty Implications of Remittances

Deriving any strong conclusions about the impact of migration on development and developing appropriate policies to make better use of remittances require precisely identifying the effects of remittances on income growth, poverty, and inequality but the state of knowledge about them is rather patchy (Newland, 2003). Our analysis has so far focused on the behavior of remittances flowing into Turkey and Mexico, with the discussion largely centered around the implications of cyclical characteristics of remittances at a macroeconomic (or national) level. While the implications of remittances for poverty alleviation at a more disaggregated (or local) level are closely related to their cyclical characteristics, there certainly are additional dimensions that need to be considered. The existing literature (as extensively surveyed by Chimhowu, Piesse and Pinder, 2003, and Aguinas, 2006) includes ample evidence pointing to the need to be cautious in viewing remittances as a consistently effective instrument to help reduce poverty.

Taylor et.al. (2005) emphasize that remittances would be likely to contribute to poverty alleviation, when remittance receipts are considerable and migrants originate mostly from poor households. In some cases, however, migration may be a risky venture (smugglers) that is costly (recruiters' fees) for migrants from poorer households to afford. Under such circumstances, migrants may come from the middle and upper segments of income distribution and family members they leave behind may not belong to the poorest sections of the society. The poverty effects of remittances would presumably be the strongest, if the majority of workers that migrate from a country do so because they view accepting employment abroad as a way out of poverty. Conversely, if individuals who migrate abroad are mostly skilled workers/belong to those sections of the society with incomes above poverty levels and hence the left behind families have reasonably high standards of living, remittances may lead to a further deterioration in income distribution in the recipient country (Adams, 1991).

Given the selective nature of migration, those who suffer from chronic poverty may not benefit from remittances (Chimhowu, Piesse and Pinder, 2003). Martin (1980) notes that for each Turk that the German employers actually wanted to recruit, there were 10 Turks wishing to be considered for employment in Germany at the beginning: With such an excess supply of candidates, the German employers could afford to be selective, and they were. Some 30 to 40 percent of the Turks applying for work in Germany were skilled workers in Turkey, and were still willing to work as manual laborers in

jobs that require no skills in Germany. Paine (1974) reports a similar experience for Yugoslavia where most of the migrants recruited to work in Germany were skilled rather than unemployed.

To summarize, remittances' potential to have any poverty effects depends first and foremost on whether remittance receiving households are among the poorer sections of the society. Despite variations across individual countries, the analysis of a sample of 71 developing countries by Adams and Page (2005) produces a statistically significant result pointing to a strong impact that international migration and remittances have on poverty on the average. By this result, a 3.5 percent decline in the share of people living in poverty caused by a 10 percent increase in official remittances per capita . The authors recognize that international migration and remittances may be endogenous to poverty: In other words, variations in the level poverty in developing country may cause changes in both the share of migrants and in the level of remittance receipts. In light of the multi-faceted nature of the issue at hand, Adams and Page (2005) duly point out that more attention needs to be paid to collecting and publishing better data on international migration and remittances.

This discussion reveals that the net effect of remittances on poverty levels in individual recipient countries is hard to predict without detailed information on socio-economic characteristics of households that receive remittance income. Obviously, remittances would be more effective in reducing poverty, the higher the share of individuals from lowest income groups among all migrant workers from a country. We submit that another generalization can be made based on the nature of co-movements between remittances and home country business cycles. In general, poverty alleviation effects of remittances, if any, would be stronger, the higher the degree of countercyclicality between remittance flows and output/consumption cycles in the home countries of workers. Even though a procyclical remitting behavior is much less likely to be observed when a considerable number of migrants are from poor backgrounds and have close relatives back home, procyclicality of remittances vis-à-vis consumption cycles in the home countries of migrants would imply that their poverty effects would be minimal or worse yet, might be negative as the decline in remittances during the times of economic crises would presumably hinder efforts for poverty alleviation.

When remittances are countercyclical, on the other hand, they would be expected to contribute to poverty alleviation or at least, to help prevent increases in the levels of poverty during cyclical slowdowns/contractions in economic activity and increased unemployment back home. Yet, even when this is the case, remittances are often pretty volatile (though less volatile than private capital flows) and hence unreliable –due in part to the uncertainties facing migrant workers created by cyclicality of economic activity in the country of employment as discussed before. Furthermore, remittances tend to decline over time as the migrants return to their home countries or get increasingly integrated into the society in the country of destination (DeSipio, 2000). The latter can, in fact, be viewed as one of the main reasons underlying the procyclical remitting behavior of Turkish workers in Germany as argued before. In the long run, the migrants often reunite with their immediate families in the country of destination and their ties with the remaining family members and relatives get weaker (due, among other things, to the deaths of elderly family members). As a result, sending money to support financing of the current consumption of relatives gradually loses its priority in migrants' consumption/saving decisions as noted by Sayan (2006) also.

Naturally, even if remittances are countercyclical, they will have little effect on poverty when remittance receiving households are mostly above the poverty line. Then, in order to estimate the

magnitude of poverty alleviation effects of remittances in Mexico and Turkey accurately, detailed surveys taken from large samples of households will also be needed.

While we do not use such surveys here, our findings based on macroeconomic time series hint that countercyclical remittance receipts of Mexico from the US have a potentially greater role in alleviating poverty as compared to procyclical remittance receipts of Turkey from Germany. Results from our analysis of the co-movements between cyclical components of real remittances over the real consumption cycles in Turkey (not reported here due to space limitations[22]) indeed show that real remittances from Germany are procyclical with and follow the respective real consumption cycles in Turkey with a lag of one quarter. In other words, remittances cycles move in the same direction as the cyclical component of the respective consumption series, peaking one quarter after the latter. This result strongly hints that the main motivation behind remittances from Germany is not smoothing of consumption expenditures of relatives back home, supporting the previously arrived conclusion that remittance receipts of Turkey from Germany do not increase during the periods of economic hardship. Instead, remittance receipts increase with increased economic activity (and hence reduced unemployment) in Turkey as consistently with previously reported results. One gets tempted to conclude, under the circumstances, that remittances from Germany are not likely to have major poverty alleviation effects in Turkey, at least as far as nationwide poverty levels are concerned. Admittedly, however, presenting a stronger defense of this conclusion requires detailed answers to face to face surveys with families with at least one member living and working abroad.

While not many of them are available, the findings reported in such surveys do not conflict with our arguments. A 1996 survey, for example, shows that in a sample of 1,773 households interviewed in Turkey, the median value of remittances received in the 12 months preceding the survey was only US $ 401 (van Dalen et.al., 2005). Apparently, this relatively low amount was due to the economic crisis that hit Turkey in 1994 (Gallina, 2006) but the survey also indicated that about 12 percent of the households benefited from remittances in one form or another and that the remittances are used for both consumption and investment, with most of the receipts used to finance the daily costs of living, such as food, clothing, rent, etc. The share of remittances used for productive investments is low. If any, they are mostly in the form of small services or manufacturing firms and with little multiplier effect (Koc and Onan, 2004). A 1990 study cited by Koc and Onan (2004) reported that about 20 percent of the receipts was used for personal consumption, while about 30 percent was allocated to improving housing conditions of the recipient households.

Financing of a land purchase or construction of a house by migrant workers (who presumably plan to return home after staying a certain period of time in the country of destination) is another motivation for remitting behavior often cited in the literature. Yet, in the case of Turkish migrants in Germany, this does not seem to be the case as our results (not reported here) show. Consistently with the previously discussed tendency of the majority of Turkish migrants in Germany to postpone the return indefinitely, the results point to no co-movement between real remittances and construction expenditures. The 1996 Turkish International Migration Survey also stated that 80 percent of the amount received by households was used to improve the household's standard of living, 7 percent to pay medical bills, 4 percent to cover the costs of weddings and the remaining 3 percent was used to buy land or a house (Koc and Onan, 2004).

[22] These results are available upon request.

While the survey evidence is patchy, it does not seem to contradict with our conclusion that remittances are not very likely to have significant effects on poverty reduction in Turkey. They certainly contribute to improvement of the standards of living of recipient households but they are not critically important for them, as our findings on the procyclicality of remittances with the Turkish GDP and consumption expenditures seemingly suggest.

Our results concerning the Mexican-US case (not reported here due to space limitations[22]) show that real remittances from the US are countercyclical to the real consumption cycles in Mexico and tend to peak one quarter after a drop in total consumption expenditures in real terms. The same pattern is observed in the case of consumption expenditures on non-durables (including food and other basic needs) and durables. This is a significant finding, as it indicates that remittances tend to increase about a quarter after a drop in expenditures on basic consumer needs that are known to have a higher share in total consumption spending of lower income groups. In other words, remittances respond with an increase during the periods of economic hardship in Mexico as expected, hinting, in turn, that smoothing of consumption expenditures of relatives back home is still one of the main motivations behind remittances that Mexican workers send from the US. One can then conclude that Mexican remittances from the US are more likely to have poverty alleviation effects when compared to remittances Turkey receives from Germany.

7. Conclusion

The Turkish-German and the Mexican-American migration patterns seem very similar in the sense that both predominantly involve unskilled labor immigration to a country that has strong economic ties with the home countries of migrants. However, when it comes to the remitting behavior of Mexican and Turkish workers, this study finds fundamental differences with important implications for development outcomes, including poverty:

First, the remittances sent to Turkey by Turkish workers in Germany are procyclical to business cycles in Turkey, whereas remittance receipts of Mexico from the US move countercyclically to the Mexican output. In other words, Mexico's remittance receipts from the United States tend to increase as economic activity slows down and unemployment rates go up over the business cycle in Mexico, whereas Turkey's receipts from Germany tend to decline in response to a cyclical downturn in the Turkish economy. The same patterns are also observed between remittances and consumption cycles of respective countries. This by itself implies, among other things, that remittances from the US have a greater potential to contribute to poverty reduction in Mexico than remittances that Turkey receives from Germany.

Secondly, while Turkish remittances do not seem to respond to cyclical changes in economic activity in Germany, remittances receipts of Mexico from the US clearly move in the same direction as the US output, with the increasing earnings of Mexican workers during upturns in the US economy increasing their transfers. This indicates that the potential of changes in macroeconomic policies in Germany to affect Turkish remittances is lower as compared to the potential of the US macroeconomic policies to have an impact on Mexican remittances.

Finally, we find evidence of a procyclical co-movement between the US and Mexican outputs themselves, whereas such a systematic co-movement is not observed between the Turkish and German outputs. This means that things tend to go well in the Mexican economy, when the US economy does well – but the same is not true in the case of Germany and Turkey.

Considering the last two finding together with the countercyclicality of Mexican workers' remittances with the national output in their home countries, one would expect pro-growth policies in the US to enable Mexican workers in the US to remit more because of the procyclicality of Mexican remittances with the US output. Yet, the beginning of a growth or expansion cycle in the US economy would at the same time reduce the intensity of the need that the families left behind in Mexico have for remittances to be received from the US, since a growing US economy would also pull the Mexican economy towards higher levels of economic activity and reduced unemployment. Thus, whether the net effect of the beginning of a growth or recession episode in the US on remittance receipts of Mexico will be positive or negative depends on the relative strengths of these two counteracting effects. By contrast, remittances flowing into Turkey from Germany appear to respond only to the state of economic activity in Turkey in the same direction, with the cyclical developments in the German economy having no bearing on the level of economic activity in Turkey. While this makes it easier to predict the direction of change in the level of Turkish remittances over the Turkish business cycle, such fundamental differences between the cases of Mexico and Turkey require an explanation.

The lack of responsiveness of Turkish remittances to developments in the German economy possibly has to do with the long history of Turks' migration to Germany and the established position of second or even third generation of migrants from Turkey within the German society, coupled with the higher levels of job security this country traditionally offers to employees regardless of where they are from originally. Unlike Mexican workers living in the US, Turkish migrants in Germany typically have a legal status, and have jobs that are better protected by the German law. Furthermore, sizable numbers of Turkish migrants have become small and medium business owners or self-employed in Germany over the years. This implies that a downturn in the German economy is not likely to affect their earnings, unemployment rates and hence remitting capacity as strongly as the negative effects that a downturn in the US economy might inflict upon the earnings, unemployment rates and hence remitting capacity of Mexican workers in the US, many of whom stay in that country illegally.

Although the Mexican-American migration has a longer and more farm based history, it has by no means saturated as the Turkish-German case. About 36 percent of the 20th century Mexican immigration has occurred in 1990s due to very uneven economic and job growth in Mexico and an economic boom in the United States, as also evidenced by the record number of apprehensions that occurred along the 2,000 mile border in the 1990s. Turkish migration to Germany, on the other hand, has stagnated after the restrictions placed on the inflow of Turkish immigrants starting from the 1980s. While the relatively low number of attempts for illegal entry is due in part to the effectiveness of restrictions facilitated by the lack of common borders between Turkey and Germany, the reasons for falling numbers of Turks looking for work in Germany possibly included the increasing competition from cheap labor offered by former Eastern Bloc workers after the fall of the Iron Curtain as well. Thus, Turkish workers in Germany today have been there for 20 years or more. In other words, the history of migration by Turks to Germany is long enough to allow for a weakening of their ties with any relatives back home, especially considering that the German law has in the past been modified more than once to allow for reunification of immigrant workers with immediate family members in the host country and to grant them German citizenship.

As a result of the apparent differences between the length of stay in the host country and timing of return across Turkish and Mexican workers, Turkish remittances from Germany are now driven increasingly less strongly by their desire to help family members or relatives back home, whereas such altruistic motives must still be quite strong for Mexican workers that continue to cross the US border

often by themselves, i.e., by leaving immediate family behind. This could explain the opposite cyclical characteristics of Turkish and Mexican remittances and hence, their differing potentials for contributing to poverty reduction in the respective home countries. Turkish remittances seem to have a much lower potential to help alleviate poverty in Turkey as compared to Mexican remittances indeed.

Our discussion so far in this section has underlined the differences in the capacity of host country macroeconomic policies to affect remittances receipts of Mexico (greater) and Turkey (smaller), and highlighted the differences in the effectiveness of specific policies targeting alterations in migration patterns by noting that the restrictions placed by Germany on migration flows from Turkey were clearly more effective than those introduced by the US authorities against migration from Mexico. Moreover, our analysis has shown that not only the macroeconomic environment of the home country but also policies changing the status of existing migrants have been more effective in the case of Turkish migration to Germany. The 1992 change in the German migration law granting German citizenship to Turkish citizens together with the 1994 financial crisis, for example, appear to have contributed to the switch in the remitting behavior of Turkish workers in Germany from countercyclicality to procyclicalty. The evidence that our analysis has produced regarding the effects of the immigration policy changes introduced by the US government (IRCA and the 1990 Act) and NAFTA, on the other hand, did not point out a similarly strong effect on the remittances sent by Mexican workers. On the contrary, we found no noticeable qualitative impact of these major policy changes on the remittances receipts of Mexico from the US. Our conjecture is that over time, as immigration networks developed, matured, and thus migration became self-sustaining, the role of immigration policy changes in truly affecting the migration flows and thus remittances sent to Mexico declined. The ineffectiveness of policies was also demonstrated by the booming number of apprehensions at the South-West border of the US during the 1990s –which presumably proxy the intensity of pressures for illegal entry into the US. If the 1990s' rate of illegal immigrant flow from Mexico is sustained, Mexican remittances would probably remain countercyclical to the Mexican output as illegal immigrants typically leave their families behind.

Considering recent developments in this area and looking ahead, Germany's new immigration law which went into effect in January 2005 provides for three new exceptions to the recruitment ban but these are not likely to have a major impact on Turkish remittances in either direction: (i) Foreign students will be given the option to stay in the country for one year after graduating from a German university if they choose to search for employment in Germany; (ii) Newly arriving top-ranking scientists and managers will receive the right to take up permanent residence while German nationals and other EU citizens will continue to enjoy preferential treatment during hiring processes; (iii) Foreign self-employed individuals will be able to obtain a limited residence permit provided that there is an economic interest in their activities; that they invest at least one million euros in the venture; or that they create at least 10 new jobs. Only then, these entrepreneurs will obtain an unlimited residence permit after three years of residence.

On the US side, a major change in the immigration legislation may affect the length of stay and hence remittances sent by Mexican workers. One such proposal is the Comprehensive Immigration Reform Act (CIRA), which is a United States Senate bill introduced by the 109th congress (2005-2006). It proposes to increase security along the southern United States border with Mexico, to allow long-time illegal immigrants to gain citizenship, and to increase the number of guest workers over and above those already present in the US through a new "blue card" visa program. In alignment with this act, the Secure Fence Act went into effect in 2006 primarily for the purpose of building 700 miles of new fencing along the US-Mexico border with the intention of controlling illegal immigration into the USA. There is indeed an

active debate in policy circles about the effectiveness of these newly proposed and partially enacted policy changes on the migration flows from Mexico. The assessment of the expected impact of the proposed changes carries utmost importance and the policy implications which come out of the current research may prove helpful in this debate.

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TECHNICAL APPENDIX

We consider seasonally adjusted series $x_t \in \{y_t^H, y_t^D, r_t\}$ where y_t^H represents the home country real GDP with $y_t^H \in$ {Turkey, Mexico}; y_t^D represents the destination country real GDP with $y_t^D \in$ {Germany, US}, and r_t real remittances sent home from the destination country (all in logarithms). To test the stationarity of both the original and the detrended series, we use Augmented Dickey Fuller (ADF) tests.[23] They all exhibit growth and thus equation to be estimated becomes:

$$\Delta x_t = \alpha + \beta t + (\rho - 1)x_{t-1} + \gamma_i \sum_{i=1}^{m} \Delta x_{t-i} + \varepsilon_t \qquad \textbf{(1)}$$

where t is time and ε_t is the disturbance term.

We determine the appropriate lag length by iteratively omitting the highest order insignificant lag and simultaneously paying attention to the Durbin-Watson statistic to control for possible autocorrelation. In equation (1), there is either (i) a unit root ($\rho = 1$), no time trend ($\beta = 0$), and a nonzero intercept providing a drift term to create growth; or (ii) there is no unit root ($\rho < 1$), but there is a time trend ($\beta \neq 0$), so that x_t is stationary around a deterministic trend.

We conduct an F-test by defining $H_0 : \rho = 1 \; and \; \beta = 0$. If this null hypothesis is accepted, we conclude that x_t is non-stationary (i.e., has a unit root with drift). If this null is rejected based on F-test results, then we must have three possibilities to entertain: (i) $\rho \neq 1 \; and \; \beta = 0$; (ii) $\rho = 1 \; and \; \beta \neq 0$ or (iii) $\rho = 1 \; and \; \beta \neq 0$. The first one of these possibilities is inconsistent with our observation related to the growth of x_t and is ruled out. The third one is also ruled out since it implies the simultaneous existence of a unit root and a trend which is unrealistic as noted by Perron (1988) and by Holden and Perman (1994). Thus, we conclude that x_t is stationary around a deterministic trend, if the null above is rejected.

If a series turns out to be non-stationary, it needs to be detrended. We detrend each series x_t to separate its trend (growth) component, τ_t, from the cyclical components, c_t:

$$c_t = x_t - \tau_t \qquad \textbf{(2)}$$

The detrending approach we adopt is to estimate the (unknown) trend τ_t of each output and remittances series by fitting a polynomial of degree k of the form

$$\tau_t = \alpha + \sum_k \beta_k t^k + \varepsilon_t \qquad \textbf{(3)}$$

where t is time and ε_t is the disturbance term.

The polynomial fit to the trend must have statistically significant estimates for α and some of the β coefficients and once it is removed from the original series, the remaining cyclical component must be stationary with zero mean. In case more than one polynomial fit satisfies these conditions, AIC and SCI values resulting from Dickey Fuller regressions are used to determine the best fitting polynomial, with smaller values considered to be better. Finally, we check the stationarity of the cyclical components by using standard unit root tests.

[23] Phillips-Perron (PP) test is used for robustness.

Correlation Analysis

We use the stationary series representing cyclical components of real remittances and output series to identify cyclical characteristics of remittances by calculating contemporaneous and asynchronous cross correlations between them. We say that remittances are procyclical (countercyclical) with –the movement of the cyclical component of–real output, if the contemporaneous cross correlation (cross correlation at time t=0) between the two series is positive (negative) in a statistically significant sense (Kydland and Prescott, 1990; Pallage and Robe, 2001; Alper, 2002). Procyclicality (countercyclicality) of remittances in this context refers to the tendency of real remittance receipts by each country to move above its trend, whenever the corresponding real output variable is above (below) its respective trend. In the absence of such a tendency, remittances and output are said to be acyclical.

While calculating asynchronous correlations between cyclical components of relevant output variables and real remittances, the latter was shifted by one to four quarters in both directions. The resulting cross correlation coefficients enable one to identify possible phase shifts by looking at how early or how late the highest correlation appears relative to the contemporaneous period (Pallage and Robe, 2001). If the largest (in absolute value) significant correlation between a particular series and the real output occurs when the series is shifted backwards (forwards), then the variable is said to be leading (lagging) the cycle. If, for example, the largest significant correlation coefficient between real output and a procyclical series is obtained when that series is shifted back (forwards) by q quarters, then the series is understood to have a tendency to peak about q quarters before (after) the real output peaks. In such a case, the series is said to lead (lag or follow) the –output– cycle.

To evaluate the statistical significance of the correlation coefficients calculated, the null hypothesis that the unknown population correlation, ρ, is equal to zero is tested against the two-sided alternative that H_A: $\rho \neq 0$, using the correlation coefficients, r, calculated from the relevant samples. In deciding whether to reject or not reject the null hypothesis, the critical t-values are determined according to

$$t = r.\sqrt{\frac{n-2}{1-r^2}} \qquad \textbf{(4)}$$

where n is the number of observations in each sample. With n=60, for example, this value is expected to fall with a 95 percent probability into the [-2, 2] bracket, when the null hypothesis is true. So, by rearranging terms in equation (4), one obtains

$$\frac{1-r^2}{r^2} = \frac{n-2}{t^2} = \frac{n-2}{(\pm 2)^2} \text{ or } \frac{1}{r^2} = \frac{n+2}{4}$$

implying the following:

$$t = r.\left(\frac{n-2}{1-r^2}\right)^{1/2}$$

This means that correlation coefficients falling outside the $[-2/\sqrt{n+2}, +2/\sqrt{n+2}]$ range will require that the null hypothesis be rejected, i.e., will be considered significant statistically.