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## Determinants of Overseas Filipino Worker (OFW) remittances

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## UP School of Economics Discussion Papers

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### **Determinants of Overseas Filipino Worker (OFW) Remittances**

by

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# **Determinants of Overseas Filipino Worker (OFW) Remittances**

**Renato E. Reside, Jr.<sup>1</sup>**

**DRAFT**

**November 16, 2009**

## **Abstract**

This study estimates determinants of remittances to the Philippines. Remittance growth responds to real growth in the Philippines and in host countries, exchange rates, interest and deployment rates, inflation, as well as to immigration and employment policies. While most studies conclude that remittances are exclusively either driven by altruistic or self-interested motives, the evidence in this study supports remittances driven by both. The dual nature of remittances means that remittances can contribute to both consumption smoothing and business cycle amplification. Thus, remittances can be either countercyclical or procyclical depending on the shocks affecting them. Nominal price and exchange rate shocks give rise to the former response, while real shocks lead to the latter response.

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## **I. Introduction**

The Philippines has had a long history of sending migrant workers abroad to augment domestically-earned income. Historically sluggish and volatile per capita GDP growth and high domestic unemployment, combined with a rising domestic population, knowledge of English and a willingness to work in any location under a wide variety of conditions and far away from their families, have conditioned many Filipino workers to view overseas contractual work as a viable and often necessary option. Tacit government acknowledgement that insufficient domestic opportunities exist has led to strong bureaucratic support and commitments for finding opportunities for deploying overseas Filipino workers (OFWs). The ensuing flow of remittances from the millions of Filipinos working abroad has approached 15 percent of the nation's gross domestic product in recent years, and has been an invaluable support to the retail, education and medical industries as well as to small business investments.

Remittances finance a host of expenditures. A recent survey conducted among OFWs by the central bank, the Bangko Sentral ng Pilipinas, BSP (2009) suggests that remittances finance procurement of food (96.2% of all families receiving remittances) and education (68.2%), payment of medical expenses, debt servicing (51.1%) and savings accumulation (38.3%). The growing importance of remittances to the domestic economy and possible effect on them of the global financial crisis has fueled renewed interest in analyzing remittances. This study examines the macroeconomic determinants of remittances using a broad cross-country dataset. To build an empirical specification, however, a review of cross-country and Philippine remittance literature is necessary.

The next parts of the paper discuss history and trends in remittances. Part II is a review of the literature, while Part III examines recent trends in Philippine remittances. Part IV explains how data is generated and how the empirical model is specified. Part V is an analysis of the empirical results for the model, while Part VI presents conclusions drawn and recommendations.

## **II. Background literature**

Building an empirical specification will rely on a host of previous theories about remittance drivers around the world and, to more closely capture local realities, on qualitative observations about trends in remittances specifically sent to the Philippines. Most studies on remittances are of two types – those that examine the impact of remittances on the economy and those that examine the determinants of remittance flows. The latter category can further be broken down into studies that examine the microeconomic motives for remitting and studies that focus on macroeconomic determinants. Much of the literature on the determinants of remittance flows focuses on individual motives for remitting.

### ***Microeconomic determinants***

Cross-country studies on microeconomic determinants of remittances usually focus on altruistic versus more self-interested motives for remitting. If remittances are determined by altruistic motives (Lucas and Stark (1985), Chami, Fullenkamp and Jahjah (2003), Rapoport and Docquier (2006)), then remittances should increase with migrants' income, and should be

countercyclical – that is, remittances from migrant workers should increase when their families at home undergo adverse income shocks, such as a recession, and when the home country currency depreciates, reducing the family's ability to purchase imported necessities. In other words, remittances enable migrant worker families to absorb shocks and smooth consumption. On the other hand, other studies, such as Straubhaar (1986), Elbadawi and Rocha (1992), El-Sakka and McNabb (1999), Buch and others (2002), Sayan (2006) and Lueth and Arranz (2007) argue that remittances are procyclical. Procyclical remittances are more consistent with self-interested motives for remitting, such as for investment purposes.

Studies by Piore (1979) and Mesnard (2004) focus on the migrant's savings target (or earnings target). It is assumed that the migrant's goal is to return home with a certain amount of savings – the saving target (or target earnings). The migrant has an interest in reaching the saving target and to minimize the drains from income (i.e., consumption expenses in the host country and the money remitted to the family). Thus, variables such as length of stay, intensity of work and flow of remittances are continuously adjusted.

The literature on temporary/permanent migration, including return migration has also contributed much to the analysis of microeconomic determinants of remittances. A study of 100 countries by Freund and Spatafora (2005) finds that the stock of migrants is a primary determinant of remittance flows. Thus, policies affecting OFW deployment and returns should affect subsequent remittance flows, so this study incorporates these into the analysis. Regulations to combat money laundering and terrorist financing, such as the introduction of requirements-to-know-your-client (CGAP, 2005, Hastings, 2006) may also influence remittances.

### ***Macroeconomic determinants***

The OECD (2006) argues that most of the current literature on the determinants of remittances is concentrated on individual motives to remit, rather than on macroeconomic variables. To be sure, aggregate remittance flows will reflect the underlying microeconomic considerations which determine individual decisions about remittances. Nevertheless, it is reasonable to expect that some macroeconomic factors, both in the host and home country, may significantly affect the flow of remittances. **Migrants' savings that are not needed for personal or family consumption may be remitted for reasons of relative profitability of savings in the home and host country, and can be explained in the framework of a portfolio management choice. In contrast to remittances for consumption purposes, remittance of these kinds of savings have an exogenous character related to the system of migration, and are expected to depend on relative macroeconomic factors in the host and home country, i.e. interest rates, exchange rates, inflation, and relative rates of return on different financial and real assets.**

Other examples of macroeconomic studies of remittances and corresponding factors found to affect remittances include a 2004 study on the Dominican Republic by Orozco (remittances respond positively to macroeconomic factors such as home country inflation and negatively to interest rates on lending), Orozco and Lowell (2005) and Glytsos (2001) (inflation and exchange rate changes in countries of origin), and Vargas-Silva (2007) (exchange rates, prices, returns to investment, and output (at home and host countries)). Vargas-Silva and Huang

(2005) find that remittances respond more to changes in the macroeconomic conditions of the host country, than to changes in the macroeconomic conditions of the home country.

Gupta (2005) analyzes the determinants of remittances to India and finds that their growth over time can be explained by the increase in migration and total earnings of the migrants. Remittances are also affected by the economic environment in source countries, and appear to be countercyclical - higher during periods of low economic growth in India. None of the remaining economic or political variables considered in the paper, including political uncertainty, interest rates, or exchange rate depreciation, are found to affect remittances significantly.

### *Philippines-specific studies*

In spite of the growing importance of remittances to the Philippine economy, there are very few studies regarding the subject. A study by Tan (2005) looks at underlying microeconomic determinants of remittances, while a study by Burgess and Haksar (2005) is an example of a study that have examined the economic impact of remittances in the Philippines. The authors also find a short-term stabilizing role played by remittances, as they find that negative shocks to consumption leads to increases in real income from abroad.

Yang (2003) finds that the pattern of OFW return migration is affected by life cycle considerations instead of target earnings considerations. Yang concludes that households choose the length of stay overseas that balances the marginal benefit from higher savings overseas (and thus higher lifetime consumption) against the marginal utility cost of overseas. Thus, OFW tenure abroad is driven by a desire to optimize earnings over the life cycle, prolonging their stays overseas during periods when the host country currency appreciates in real terms. Yang finds limited support for target-earnings-driven patterns of OFW return migration, where the timing of migrant returns are determined by the accumulation of the needed target earnings.

The BSP has also conducted studies on the macroeconomic determinants of remittances (Dakila and Claveria, 2007, Tuano-Amador, et al, 2007). The former finds that in general, remittances are procyclical with respect to the exchange rate: exchange rate depreciations lead to an increase in remittances. However, their findings on whether the exchange rate is procyclical with respect to Philippine output is less convincing, as most results are insignificant. Tuano-Amador, et al showed evidence to suggest that remittances have led to the recent appreciation of the peso in real terms. They also find evidence of procyclicality of remittances, as they find a slightly positive correlation between Philippine GDP and remittances and they also show that the log difference in Philippine and US per capita GDP has a significantly positive coefficient when used a regressor to determine the remittance to GDP ratio. However, they are unable to control for the influence of exchange rates on remittances. Settling the procyclicality issue is however, important, since pro- and counter-cyclicality have different implications for OFW behavior and policy response. This study seeks to more strongly verify the BSP findings that exchange rates and output affect Philippine remittances. This study also looks at a broader set of countries, possible determinants, including prices and policies that affect immigration and employment.

In recent work related to this study, Reside (2009) qualitatively reviews the response of cross-host-country remittance data to adverse shocks such as the oil price glut in the 1980s, the

1990s Asian financial crisis and 2002 Dot-Com crisis. These event studies suggest that remittances are very closely related to host country real GDP growth during economic crises and are likely to be procyclical relative to Philippine real GDP growth. But this amplifies the impact of a global crisis on the Philippines – not only is the Philippines’ domestic income affected by crisis; remittances to the Philippines are adversely affected by it as well. During the Asian crisis, Yang (2003) observed as a tendency for migrant workers to maximize the value of their remittances – by leaving countries whose currencies depreciated more in real terms relative to the Philippine peso. This desire to maximize remittances reflects altruistic behavior.

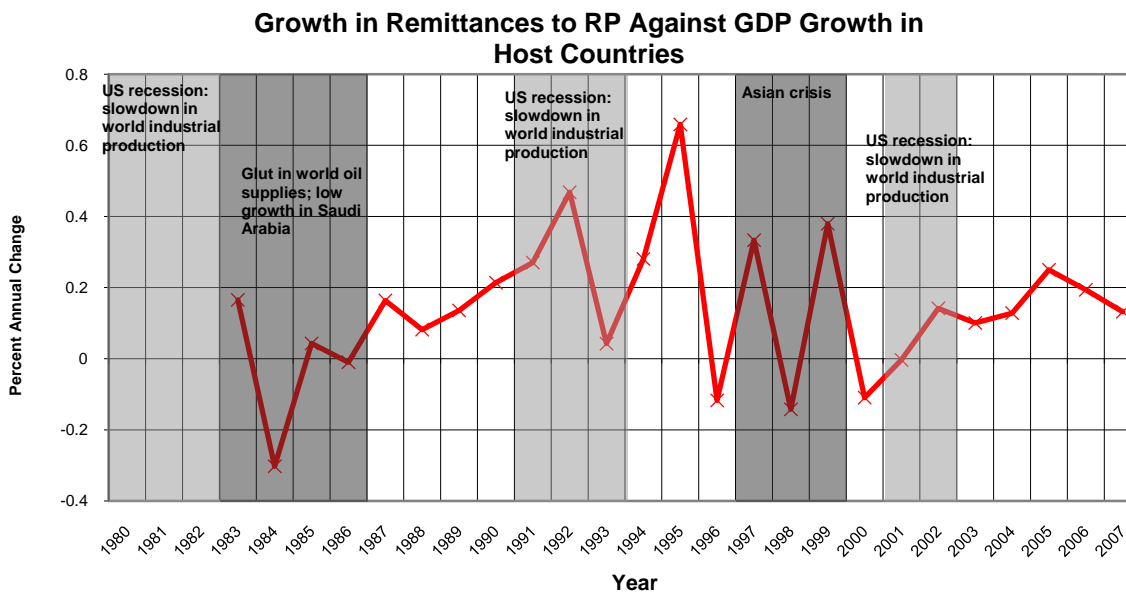
Beyond crisis situations, Reside (2009) shows that other voluntary, policy-induced and other restraints on deployment of Filipino workers and effects of changes in policies or laws on remittances have effects on bilateral remittance flows. These must be controlled for in order to isolate the effects of purely economic shocks on remittances to the Philippines. Effects of non-economic shocks must be isolated as well. These include changes in law and immigration policies. The most important non-economic shocks include:

- i) Policies that favor hiring of nationals of key host countries, at the expense of migrant workers from overseas (such as in Saudi Arabia recently);
- ii) the passage of the Overseas Workers Act by the Philippines in 1995, which imposed restrictions on migrant workers, which had immediate effects felt in the following year;
- iii) the Philippine government’s worldwide ban on deployment of domestic helpers in 1988;
- iv) restrictions on immigration enforced by Western countries in the wake of the terrorist attacks in September, 2001;
- v) laws that restrict immigration into host countries, such as recent laws passed by the Japanese diet restricting the number of Filipino workers eligible to work as entertainers in Japan; and
- vi) the effect of the SARS crisis in 2003.

### **III. Trends in remittances to the Philippines**

Figure 1 below charts the growth rates of remittances to the Philippines from 1980-2007. Note that remittance growth has been not been stable, displaying the greatest volatility in the years of the Asian financial crisis in the 1990s. The deepest troughs in the graph occurred during the world oil glut in the mid-1980s (which adversely affected Saudi Arabia, the biggest employer of OFWs), as well as the Asian crisis in 1998. The highest peaks in growth occurred in the early 1990s, coinciding with robust growth in the country, as well as the Asian region in general, which had at that time, slowly been growing in importance as an employer of OFWs and thus as a source of remittances.

**Figure 1**



The National Statistics Office (NSO) collects household level data on remittances. A look at the NSO data on remittance shares by host country and region (see Tables 1a and 1b below) reveals that the share of remittances from East Asia rose gradually from the early 1990s, peaked in 2000, and has been declining since. This is a mirror image of the share of Middle East, whose share declined in the mid-1990s, reached its lowest point in 2003, and has been rising since. This pattern is consistent with the emergence of China as a base for production, as well as of the emergence of rival source countries such as Indonesia.

**Table 1a: Selected region and country shares in remittances to the Philippines, 1991-2007**

Country/Region	1991	1992	1993	1994	1995	1996	1997	1998
<b>East Asia</b>			19.04%	25.44%	28.95%	29.06%	31.00%	29.41%
HK	5.42%	5.01%	5.78%	8.38%	11.22%	11.40%	8.69%	10.16%
Japan	13.24%	10.74%	10.18%	13.05%	7.90%	8.22%	9.48%	9.05%
Taiwan	0.01%	0.18%	1.26%	2.38%	7.86%	5.16%	9.74%	8.48%
<b>Southeast Asia</b>		0.00%	7.51%	7.66%	8.54%	6.68%	9.21%	7.85%
Malaysia	0.63%	0.69%	1.26%	1.76%	1.34%	1.36%	1.83%	1.92%
Singapore	0.76%	0.76%	4.28%	4.66%	5.92%	3.82%	5.30%	4.86%
<b>Middle East</b>		47.74%	48.17%	41.84%	38.70%	33.84%	35.04%	35.96%
Kuwait		3.02%	4.60%	2.02%	2.16%	2.02%	2.26%	2.24%
Qatar		1.26%	1.01%	0.63%	0.60%	0.95%	0.55%	0.65%
Saudi Arabia	33.72%	34.44%	36.81%	34.97%	31.51%	25.85%	27.32%	26.48%
UAE	4.64%	4.50%	2.83%	2.19%	2.69%	2.65%	2.47%	4.48%
<b>Australia</b>		0.25%	3.30%	2.56%	2.69%	1.57%	3.82%	3.89%
<b>Europe</b>		2.37%	8.27%	9.01%	9.59%	12.19%	10.57%	10.96%
<b>North and South America</b>	2.35%	2.66%	10.38%	8.63%	8.48%	13.11%	6.53%	8.89%



**Table 1b: Selected region and country shares in remittances to the Philippines, 1991-2007**

Country/Region	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>East Asia</b>	29.09%	31.37%	26.98%	23.93%	29.14%	25.77%	23.21%	22.21%	20.90%
HK	8.01%	8.69%	8.91%	7.70%	8.26%	6.77%	5.63%	5.21%	6.70%
Japan	9.70%	11.14%	9.39%	8.54%	11.97%	10.21%	8.55%	7.14%	5.60%
Taiwan	8.47%	7.87%	6.65%	5.21%	5.46%	5.12%	5.82%	5.01%	5.50%
<b>Southeast Asia</b>	7.10%	5.62%	7.29%	8.82%	4.95%	5.42%	5.24%	5.89%	10.30%
Malaysia	0.86%	0.22%	1.01%	1.57%	0.99%	0.68%	0.58%	0.93%	2.50%
Singapore	4.09%	4.28%	4.93%	5.22%	3.15%	3.18%	3.58%	3.23%	6.00%
<b>Middle East</b>	34.08%	35.78%	34.83%	37.55%	34.29%	37.46%	40.16%	41.15%	46.80%
Kuwait	1.88%	1.16%	2.27%	2.83%	1.28%	2.76%	2.87%	3.13%	4.40%
Qatar	0.38%	0.88%	0.75%	0.86%	0.68%	1.71%	4.02%	3.38%	4.50%
Saudi Arabia	27.28%	26.98%	25.32%	26.85%	26.10%	22.77%	23.03%	21.19%	19.80%
UAE	1.57%	3.20%	3.74%	3.09%	3.22%	5.50%	6.17%	7.73%	12.10%
<b>Australia</b>	2.51%	2.53%	2.67%	2.23%	3.12%	2.16%	3.08%	1.11%	1.90%
<b>Europe</b>	12.22%	11.28%	15.51%	14.88%	12.34%	14.73%	14.32%	12.64%	9.20%
<b>North and South America</b>	12.32%	9.26%	9.81%	9.13%	12.81%	10.92%	10.85%	13.28%	9.30%

Note: These shares are calculated based on household data collected by the National Statistics Office (NSO) for its Survey of Overseas Filipinos (SOF). The SOF was first officially published in 1993, so the shares for 1991-1992 were based on estimates by the author. Some cells are blank because they could not be calculated based on available information.

#### **IV. Developing remittance data and model specification**

Developing a dataset usable for remittance policy analysis (of cross-host-country sources of remittances) has been a challenge in many studies on remittances. Developing a good Philippine dataset for empirical work in this paper is no exception. For the Philippines, there are three sources of data. One is official data compiled by the Bangko Sentral ng Pilipinas (BSP) regarding remittances coursed through the Philippine banking system (see Table 2). The other source is the National Statistics Office's (NSO) annual Survey of Overseas Filipinos (SOF). While the former is broken down by country, it is well-known that there is a bias towards remittances coming from the Americas. Official remittance data from the Philippines is collected by the Bangko Sentral ng Pilipinas (BSP), which categorizes sources of remittance flows according to the nationality of the bank through which the remittance was coursed. Since many correspondent banks are of American origin, the data has an inherent US bias. Thus, one has to adjust the official data to correct for this bias.

One the other hand, the SOF remittance data is derived from an annual survey of households conducted by the NSO. Since the sample used in the SOF is fairly representative of OFWs abroad, it suffers less from biases, and may be a more accurate gauge of where remittances actually originate. The annual SOF remittance data (see Tables 1a and 1b) clearly show that the largest volume of remittances emanate from the Middle East (i.e., the Middle East, in particular, from Saudi Arabia). Combined with the fact that OFW wages are higher elsewhere (especially in more developed countries in North America and Europe, this is consistent with the

fact that the largest share of OFWs deployed are in the Middle East (and in Saudi Arabia in particular). Deployment concentration is next highest in other parts of Asia, such as in East and Southeast Asia. Even with incomplete figures on annual data on migrant stocks, **it would be possible to reckon therefore that NSO regional remittances shares are reasonable (yet nevertheless somewhat imperfect) proxies for the stock of OFWs in a particular region from the early 1990s to recent periods.**

**Table 2: Estimates of transfers made by OFWs (in US dollars)**

Year	BSP Estimate of Remittance Flows	Year	BSP Estimate of Remittance Flows	Year	BSP Estimate of Remittance Flows	Year	BSP Estimate of Remittance Flows
1991	1,500,290,000.00	1996	4,306,640,000.00	2000	6,050,450,000.00	2004	8,550,371,000.00
1992	2,202,380,000.00	1997	5,741,835,000.00	2001	6,031,271,000.00	2005	10,689,005,000.00
1993	2,295,900,000.00	1998	4,925,309,000.00	2002	6,886,156,000.00	2006	12,761,305,000.00
1994	2,940,270,000.00	1999	6,794,550,000.00	2003	7,578,458,000.00	2007	14,449,928,000.00
1995	4,877,510,000.00						

Source: Bangko Sentral ng Pilipinas

To correct for the inherent American bias in the data and to generate remittance data by host country, a straightforward method of adjustment is applied. The BSP's world total of US dollar-valued remittances from land-based OFWs<sup>2</sup> was multiplied by the host country shares of remittances in the National Statistics Office's Survey of Overseas Filipinos (NSO-SOF) (see Tables 1a and 1b). The resulting adjusted series broken down by country and this serves as the main remittance dataset for this study. The adjustment is done for both quarterly and annual remittance time series data. Generating quarterly data was done in order to analyze high frequency responses of important variables to economic shocks and crises. To generate quarterly remittance data by host country, annual NSO shares were assumed to apply to all quarters in a year. This seems reasonable, since the survey period for the annual SOF runs from April to September every year, which covers two quarters. Shares were assumed to hold in the other quarters. The per country dollar amounts were then converted into Philippine pesos at the exchange rate prevailing for that year and deflated using the GDP deflator to derive real peso remittances. Real remittances in the host country's local currency were also derived by applying the relevant exchange rate to the dollar data, and then deflating these by the relevant GDP deflator. Thus, this study uses estimates of US dollar, Philippine peso and local host country currency estimates of bilateral remittances.

Non-remittance data come mostly from the Philippine Overseas Employment Authority (POEA) and the International Monetary Fund's International Financial Statistics (IFS). The POEA data includes annual processing and deployment of OFWs. Processed OFWs refer to those who already have job offers. On the other hand, deployed OFWs are those who have actually gone abroad to work. POEA's Annual Reports are also an invaluable source of data,

<sup>2</sup> Sea-faring OFWs cannot be attributed to anyone country; landbased OFWs account for about 80% of the total number of OFWs deployed.

especially for analyses of the factors that affected OFW deployment and remittances in the late 1970s and 1980s. The IMF data includes historical macroeconomic data and forecasts of real GDP growth, world price levels and more.

This study uses log-differenced data for the most part in regression analysis. Because log-differencing effectively converts data originally in levels into log growth rates, the empirical analysis will focus greatly on flow data instead of stock data. Thus, the emphasis will be on the analysis of flows, for example, of workers (deployment), instead of stocks of workers, to explain remittance flows. Thus, dummy variables to denote for instance, the years of the Asian financial crisis, can be used to proxy for return migration due to attrition and other factors, which reduces the net flow or net deployment of OFWs to a region.

The discussion in the previous paragraphs suggests an empirical specification of the following type:

**Growth in remittances = f(foreign and domestic output growth, price variables, exchange rates, dummies for country policies which affect remittances, deployment growth, others)**

This specification allows for great flexibility in incorporating much of what the broader literature suggests are the important determinants of remittances. Thus, specifications generally take the form of remittance growth regressed against lagged and current real GDP growth rates of major host countries, along with other potential independent variables, such as real exchange rates, lagged and current real GDP in the Philippines, deployment flows, dummies to control for crises and the effects of laws and policies, etc.

## V. Empirical Work

### Cross-country panel estimates of bilateral remittances from land-based workers

This section analyzes the results of estimates of remittances using panel data from major host countries. Table 3 below lists the countries involved in the empirical analysis. Table 4 lists the main variables used in the panel data analysis. Annual panel data started in 1992 and quarterly panel data started in 1996. However, only the results of the regressions using quarterly data are displayed because they consistently displayed superior within-, between- and overall R-squareds.<sup>3</sup> Since several gulf countries lack quarterly GDP series, indices for oil production in these countries proxied for real GDP. To ensure stationarity, the variables are expressed in year on year log-differenced form (so many of the variables are effectively expressed in log annual percentage growth terms). The last column of Table 4 (based on detailed regression results in the Appendix) summarizes the impact of each variable on remittance growth.

**Table 3: Countries with data in the annual and quarterly panels**

USA	Canada	Saudi Arabia	United Arab Emirates
Kuwait	Singapore	Hong Kong	Italy
United Kingdom	Japan	Malaysia	

<sup>3</sup> R-squareds for the regressions using annual data only performed well in explaining variation between groups.

To address potential endogeneity problems in the estimates owing to the potential for remittance growth to affect output growth and exchange rates in the Philippines, instrumental variable estimation techniques were used. Instruments used in the regressions included the exogenous variables in regressions, as well as predetermined (lagged) variables.

The empirical results suggest that real conditions in the Philippines and host countries matter much for remittance growth. This is manifested in the significantly positive coefficients for real output growth in the Philippines, real output growth in host countries and real growth in Middle East oil production. Remittances also respond negatively to increases in bank lending rates in the Philippines. This, combined with the result that remittances respond positively to output growth in the Philippines, formally and more strongly confirm results earlier obtained by authors from the BSP, and strongly suggests that remittances to the Philippines are partly driven by investment motives and are procyclical with respect to real output conditions.

The exchange rate and the price level play important roles in driving OFW remittances. Depreciations of the peso or the host country currency tend to translate into higher remittance growth (this result runs counter to findings of Dakila and Claveria (2007)). A real depreciation of the peso (or host country currency) versus the US dollar means that every dollar remitted has greater purchasing power. That OFWs respond to these by increasing remittances suggests that OFWs exploit favorable currency movements - compensating by remitting more (less) units of local currency. The tendency to compensate for lost income is consistent with findings of Yang (2003), and can also be seen in the positive remittance response by OFWs to inflation. When Philippine inflation rises, OFWs make-up for reduced purchasing power by remitting more.

***Interestingly, while the behavior of remitters in response to real output movements is not consistent with altruistic behavior, their behavior in response to exchange rate movements and movements in other nominal variables, such as prices, is. Remitters respond display procyclical, self-interested behavior with respect to real variables, and countercyclical, altruistic behavior with respect to exchange rate and nominal variables.***

Current deployment growth in low-frequency data leads to greater remittance growth. This is consistent with migrant workers' remitting earnings within a year of starting work. Meanwhile, world oil price shocks lead to lower remittance growth. This suggests that as cost of living increases in host countries, migrant workers remit less. Evidence of non-linearities are also found. The coefficient of the dummy variable for quarters in which real output growth in RP and host country are BELOW (ABOVE) one standard deviations from the mean is generally negative (positive), suggesting that when the economies of both RP and host countries are simultaneously substantially booming or slowing down, remittance growth rises or falls significantly. Other factors negatively affecting remittance growth include dummies for the Asian crisis years (asiancris), employment and immigration policy restrictions imposed by host countries (polhst), as well as the year of the SARS outbreak, 2003. The dummy Europe (Italy and the UK) also had a significantly negative impact on remittances, perhaps because of several reasons – appreciating currencies or trend reductions in deployment. In general, results do not change substantially when the remittances are valued in US dollars or in pesos.<sup>4</sup>

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<sup>4</sup> These results are available from the author upon request.

**Table 4: Quarterly and Annual data are available for the following variables** (lagged values are denoted in the dataset by variable names ending in “-l1” for one period lag, and “-l2” for two period lag, so rgdprpl1 would be real GDP of the Philippines lagged by two periods)

Variable	Description (all variables are in log differences – log growth unless otherwise specified)	Source	Impact on remittance growth of increase in variable (see Appendix for detailed estimates)
rremlochst	Real remittances of the host country in local currency	Bangko Sentral ng Pilipinas	<b>Dependent variable</b>
rremphp	Real remittances in Philippine pesos (current value and lags)	BSP	<b>Dependent variable</b>
rremusd	Real remittances in US dollars (current value and lags)	BSP	<b>Dependent variable</b>
rgdprp	Real GDP of the Philippines (current value and lags)	IFS	<b>Positive</b>
realhst	Real production (of oil in host Middle Eastern countries, real GDP of other host countries) (current value and lags)	IFS	<b>Positive</b>
cpirp	Consumer price index of the Philippines (current value and lags)	IFS	<b>Positive</b>
rerrp	Real peso to dollar exchange rate (current value and lags)	IFS and author’s calculations	<b>Real depreciation of peso raises remittance growth</b>
rerhst	Real host country currency to US dollar exchange rate (current value and lags)	IFS and author’s calculations	<b>Real depreciation of the host country currency raises remittance growth</b>
deplhstrp	Deployment to RP from host country (current value and lags)	POEA	
rerphphst	Real exchange rate – real Philippine pesos per unit of host country (current value and lags)	IFS and author’s calculations	<b>Real appreciation of the peso relative to the host country currency leads to a reduction in remittance growth</b>
belowavg	Dummy variable for quarters in which real output growth in RP and host country are BELOW the average for the sample (current value and lags)	IFS and author’s calculations	<b>No significant impact</b>
aboveavg	Dummy variable for quarters in which real output growth in RP and host country are ABOVE the average for the sample (current value and lags)	IFS and author’s calculations	<b>No significant impact</b>
below1std	Dummy variable for quarters in which real output growth in RP and host country are BELOW one standard deviations from the mean (current value and lags)	IFS and author’s calculations	<b>Negative</b>
above1std	Dummy variable for quarters in which real output growth in RP and host country are ABOVE one standard deviations from the mean (current value and lags)	IFS and author’s calculations	<b>Positive</b>
oil	Oil prices (current value and lags)	IFS and author’s calculations	<b>Negative</b>
blrq rate	Average bank lending rate in the Philippines	Bangko Sentral ng Pilipinas	<b>Negative</b>
asiancris	Dummy for quarters of Asian crisis	Author	<b>Mostly negative</b>
polhst	Dummy for quarters in which host countries enacted policies	Author	<b>Negative</b>

	detrimental to employment or immigration of OFWs (current value and lags)		
sarsc	Dummy for quarters during which the SARS virus reached peak	Author	<b>Negative</b>
Europe	Dummy for countries located in the European region	Author	<b>Negative</b>
Asia	Dummy for countries located in the Asian region	Author	<b>No impact</b>
West	Dummy for western countries	Author	<b>No impact</b>
mid east	Dummy for countries located in the Middle Eastern region	Author	<b>No impact</b>
Q1, Q2, Q3, Q4	Quarterly dummy variables	Author	<b>No impact</b>

## VI. Conclusions

This study is unique in the sense that the empirical results suggest that migrant workers display the full range of motives for remitting. Both altruistic and self-interested motives emerge as key determinants of remittances in the data. In retrospect, this *is* an intuitive result. Migrant workers leave the country for different reasons, and it should not come as a surprise that there would be different motives for remitting. That remittances respond to exchange rate movements (increasing as exchange rates depreciate) should not also come as a surprise. The more intriguing outcome is that remitters to the Philippines do not compensate recipients at home when their real income falls, but do make compensating adjustments in response to increases in inflation (which mostly corresponds to rising food prices) and unfavorable exchange rate movements.

A possible explanation for these results is that motives of self-interest dominate altruistic motives when real output shocks occur because investment is inherently lumpy and involves large discrete transfers, which are sensitive to real conditions in the country, while consumption typically involves smaller transfers. Thus, in response to a negative real shock to the Philippines, the motive to disinvest will dominate the motive to compensate recipients for lower consumption due to lowered incomes.<sup>5</sup> Meanwhile, price shocks do not necessarily affect investment motives when they occur, as the primary impact of rising prices is on consumption. Thus, OFWs compensate by remitting more.

The dual nature of remittances also suggests that remittances to the Philippines have dual effects on the business cycle. While they may smooth out consumption to recipient families, the investment-oriented component of their remittance flows tend to amplify the effects of the global and domestic business cycle. Over time, these effects may cancel each other out, but they certainly suggest complicated dynamics in the interim.

The empirical outcomes underscore the importance of trying to find good ways of mobilizing OFW earnings abroad. If these remittances respond more positively to healthy economic environments, then the issue becomes one of creating such environments. The empirical findings also raise some questions regarding exchange rate policy. If real depreciations raise remittances, and remittances support real GDP growth, is a policy of allowing the peso to strengthen over time a desirable one? Also, the BSP has found evidence that remittance flows appreciate the domestic currency. If remittances respond positively to weakening of the currency, then sterilizing the remittance flows can enhance the country's remittance income over time.

The findings also underscore the importance of lagged effects of variables on remittance growth. Since OFW contracts are typically two or more years, the full impact of economic variables on remittance growth is usually not felt until one to two years later. Thus, the impact of the current global financial crisis on remittance growth will be felt gradually over the next one or two years. Currently, the Philippines' BSP has trumpeted the fact that in spite of the global financial crisis, remittance growth has not slowed down. But is the true story going to play itself out over a longer period? Time will tell.

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<sup>5</sup> Another (more disturbing) explanation could be that recipients of remittances are not affected by real downturns in the domestic economy since they are not part of the domestic production economy and are fully dependent on the remitter. Thus, there is no need for remitting additional funds when a negative real shock occurs.

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## Appendix

**Table A: Results of panel regressions using quarterly data: Dependent variable is growth of remittances valued in local currency of host country (rreemlochst) – number in shaded region is the coefficient, number below it is its corresponding p-value.**

Variable	1	2	3	4	5	6	7	8	9
<b>constant</b>	-0.711	-0.684	-0.895	-0.864	-0.641	-0.378	-0.708	-0.724	-0.564
	0.000	0.000	0.000	0.000	0.000	0.031	0.000	0.000	0.004
<b>rgdprp</b>	10.342	9.616	12.004	11.531	11.835	3.802	10.379	10.673	8.858
	0.000	0.001	0.000	0.000	0.000	0.189	0.000	0.000	0.001
<b>rerrp</b>	2.171	2.212	0.289	1.426	1.752	1.511	2.281	2.197	2.120
	0.000	0.000	0.585	0.005	0.000	0.000	0.000	0.000	0.000
<b>realhstl2</b>	1.029	1.009	0.726	0.793	0.812	0.863	1.062	1.038	1.030
	0.000	0.000	0.015	0.007	0.003	0.001	0.000	0.000	0.000
<b>cpirp</b>	4.531	4.248	6.089	5.784	3.230	5.565	4.495	4.656	3.745
	0.001	0.002	0.000	0.000	0.008	0.000	0.001	0.001	0.009
<b>rerphphst</b>	-0.927	-0.928		-0.912	-0.913	-0.886	-0.929	-0.928	-0.933
	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000
<b>cpihst</b>		1.364							
		0.564							
<b>rerhst</b>			0.931						
			0.000						
<b>usrecess</b>			0.214	0.202					
			0.002	0.003					
<b>oil</b>					-0.416				
					0.001				
<b>asiancris</b>						-0.439			
						0.000			
<b>polhst</b>							-0.071		
							0.651		
<b>polhstl1</b>								-0.145	
								0.376	
<b>below1stdl1</b>									-0.095
									0.169
<b>Observations</b>	440	440	440	440	440	440	440	440	438
<b>R-squared:</b>									
<b>Within</b>	0.585	0.585	0.582	0.589	0.599	0.610	0.584	0.586	0.588
<b>Between</b>	0.629	0.603	0.631	0.630	0.630	0.630	0.627	0.625	0.692
<b>Overall</b>	0.590	0.587	0.587	0.593	0.601	0.611	0.588	0.590	0.598
	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>	<b>Instruments</b>
	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2

	Cpirp	cpirp	cpirp	cpirp	cpirp	Cpirp	cpirp	cpirp	Cpirp
	rerphphst	cpihst	rerhst	rerphphst	rerphphst	Rerphphst	rerphphst	rerphphst	rerphphst
	oil	rerphphst	usrecess	usrecess	oil	Asiancris	polhst	polhstl1	below1stdl1
	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1
	rerrpl1	rerrpl1	rerrpl1	rerrpl1	rerrpl1	rerrpl1	rerrpl1	rerrpl1	rerrpl1
	rerrpl2	rerrpl2	rerrpl2	rerrpl2	rerrpl2	rerrpl2	rerrpl2	rerrpl2	rerrpl2
	cpirpl1	cpirpl1	cpirpl1	cpirpl1	cpirpl1	cpirpl1	cpirpl1	cpirpl1	cpirpl1

**Table A (continued): Results of panel regressions using quarterly data: Dependent variable is growth of remittances valued in local currency of host country (rreemlochst) – number in shaded region is the coefficient, number below it is its corresponding p-value.**

Variable	10	11	12	13	14	15	16	17	18
<b>constant</b>	-0.661	-0.694	-0.698	-0.653	-0.711	-0.142	0.601	0.355	-0.991
	0.000	0.000	0.000	0.000	0.000	0.706	0.601	0.355	0.000
<b>rgdprp</b>	9.505	10.212	10.355	6.535	10.342	8.860	10.947	11.541	14.380
	0.000	0.000	0.000	0.015	0.000	0.001	0.000	0.000	0.000
<b>rerrp</b>	1.868	2.180	2.252	1.484	2.171	2.658	3.000	2.823	2.107
	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000
<b>realhstl2</b>	0.973	1.026	1.036	0.893	1.029	1.023	0.996	0.969	0.870
	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.004
<b>cpirp</b>	4.384	4.395	4.371	2.772	4.531	6.583	7.031	6.691	5.246
	0.001	0.001	0.001	0.044	0.001	0.000	0.000	0.000	0.000
<b>rerphphst</b>	-0.926	-0.927	-0.927	-0.902	-0.927	-0.915	-0.914	-0.915	-0.919
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>sars</b>	0.022								
	0.814								
<b>sarsb</b>		-0.119							
		0.430							
<b>sarsc</b>			-0.252						
			0.146						
<b>above1stdl1</b>				0.272					
				0.000					
<b>avgblrq</b>						-0.057	-0.133	-0.126	
						0.080	0.003	0.005	
<b>avgblrql1</b>							0.067	0.071	
							0.083	0.063	
<b>Belowavg</b>									0.252
									0.015
<b>Observations</b>	440	440	440	440	438	440	440	440	430
<b>R-squared:</b>									
<b>Within</b>	0.588	0.586	0.586	0.603	0.585	0.589	0.590	0.591	0.592

<b>Between</b>	0.629	0.621	0.622	0.605	0.629	0.629	0.629	0.629	0.655
<b>Overall</b>	0.592	0.589	0.590	0.603	0.590	0.593	0.593	0.594	0.598
	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects
	Instruments	Instruments	Instruments	Instruments	Instruments	Instruments	Instruments	Instruments	Instruments
	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2	realhstl2
	cpirp	cpirp	cpirp	cpirp	cpirp	cpirp	cpirp	Cpirp	Cpirp
	rerphphst	rerphphst	rerphphst	rerphphst	rerphphst	rerphphst	rerphphst	rerphphst	Rerphphst
	sars	sarsb	sarsc	above1stdl1	rgdprpl1	avgblrq	avgblrq	Avgblrq	Belowavg
	rgdprpl1	rgdprpl1	rgdprpl1	rgdprpl1	rerrpl1	rgdprpl1	avgblrql1	avgblrql1	rgdprpl1
	rerrpl1	rerrpl1	rerrpl1	rerrpl1	rerrpl2	rerrpl1	rgdprpl1	avg91tbql1	rerrpl1
	rerrpl2	rerrpl2	rerrpl2	rerrpl2	cpirpl1	rerrpl2	rerrpl1	rgdprpl1	rerrpl2
	cpirpl1	cpirpl1	cpirpl1	cpirpl1		cpirpl1	rerrpl2	rerrpl1	cpirpl1