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Going With Remittances: the Case of the Philippines

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Center for Monetary and Financial Policy
Monetary Policy Sub-Sector



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Abstract

Understanding the nature and economic drivers of remittances to the Philippines is crucial to critical thinking about the impact on the economy. However, one needs to consider a more complete picture. The contribution of this paper is a comprehensive analysis of the channels and impact of remittances on Philippine growth and inflation. This paper first lays out the nature and characteristics of remittances to the Philippines over the past decade or so. The paper then traces the impact of large changes in remittances and the challenges they create on the Philippine monetary policy transmission mechanism from 1999 to 2011.

In this paper, the preliminary simulation of an increase in remittances from a complete macro econometric model estimated for the Philippines shows that it will increase consumption, investment, labor productivity and economic growth. There are indications that the increase in remittances also leads to a change in the economic structure, in particular a decline in traded goods production and exports as well as labor market effects. Another interesting finding of the simulation is that the monetary policy transmission continues to be relevant as it feeds through market interest rates. However, the simulation results also suggest that monetary policy pass-through tends to moderate once we take into account the impact of a surge in remittance flows.

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Going With Remittances: the Case of the Philippines

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1. The context

Globalization exposes developing countries to the volatility of international markets. In the literature on financial globalization there is considerable discussion on the implications of large surges and volatility of capital flows, especially when they are routed through the financial system (e.g. Prasad et al. 2003). The surge of inflows and flight of capital can have significant effects on the economy. In many developing and emerging countries remittances are a financial flow that is as important as, and in some cases more important than, capital flows. It is often noted that remittances are more stable than capital flows to emerging and developing countries but even so, remittances are also subject to shocks.

The Philippines is not spared from the large and volatile sources of foreign exchange flows. While average foreign direct and portfolio investment captured about 1.6% of nominal GDP from 2002 to 2010, exports of goods and services and overseas Filipino (OF) remittances have exceeded capital flows as exports of goods and services and remittances amounted to more than 50% of nominal GDP during the same period.² In particular, average OF remittances from 2002 to September 2011 amounted to 9.6% of nominal GDP.

When remittances are a significant share of nominal GDP, even modest volatility can result in fluctuations in the inflows that are of macroeconomic significance. Based on the average coefficient of variation from 1996 to 2010 in Figure 1, results suggest that remittances are less volatile than borrowings as well as foreign direct and portfolio investments, but more unstable than exports of goods and services. For this reason monetary authorities should be interested in the determinants of remittances flows and how remittances affect the monetary policy transmission mechanism.

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² In a related paper, Bayangos (2011) examines the drivers of international claims and cross-border lending to the Philippines and the role of foreign banks during financial crises by modifying the Siregar and Choi (2008) gravity model from 1995 to 2009. This study finds that supply factors drove the decline in international claims to the Philippines in the run up to the global financial crisis. The demand for cross-border bank lending also dropped, albeit marginally. These findings are consistent with the general understanding that the global financial crisis originated outside the emerging markets, including the Philippines.

Understanding the nature and economic drivers of remittances to the Philippines is crucial to critical thinking about the impact on the economy. However, one needs to consider a more complete picture. Many papers have already been written about the various impacts of remittances on the Philippine economy. The contribution of this paper is a comprehensive analysis of the channels and impact of remittances on growth and inflation. This paper focuses on the short run macroeconomic effects of remittances. This paper first lays out the nature and characteristics of remittances to the Philippines over the past decade or so. The paper then traces the impact of large changes in remittances and the challenges they create on the Philippine monetary policy transmission mechanism from 1999 to 2011.

In this paper, the preliminary simulation of an increase in remittances from a complete macro econometric model estimated for the Philippines shows that it will increase consumption, investment, labor productivity and economic growth. There are indications that the increase in remittances also leads to a change in the economic structure, in particular a decline in traded goods production and exports as well as labor market effects, and this implies that the dependence on remittances increases.

Another interesting finding of the simulation is that the monetary policy transmission continues to be relevant as it feeds through market interest rates. However, the simulation results also suggest that monetary policy pass-through tends to moderate once we take into account the impact of a surge in remittance flows.

In this paper, overseas remittances refer to transfers sent by both Filipino migrants and overseas workers and coursed through banks. The rest of the paper is organized as follows: the next section traces the impact of remittances on growth. Section 3 describes the recent trends in OF remittances to the Philippines. Section 4 traces the impact of remittances on the monetary policy transmission mechanism using a quarterly macro econometric model estimated for the Philippines, including the nature of the model and methodology. Section 5 discusses the main findings and implications for monetary policy while Section 6 concludes with way forward.

2. Survey of empirical literature: tracing the impact of changes in remittances on growth³

As mentioned in Section 1, remittances in the Philippines are large relative to the economy and shifts in remittances flows will have short-term macroeconomic effects to which monetary policy has to respond. The impact of large flow of remittances on economic growth is the result of a complex set of reactions.

An increase in remittances will have direct effects on aggregate demand as the purchasing power of remittance receiving-households rises. Most studies (see e.g. Chami et al. 2003) find that the majority of remittances are consumed. Part of this will be spent on traded goods and imports will rise. The increased demand for non-traded goods will push up

³ This section draws largely from Bayangos and Jansen (2011a) and Bayangos and Jansen (2011b).

their prices. The increase in the price of non-traded goods will then increase the domestic cost of production.

Remittances may also lead to an appreciation of the exchange rate which could, in turn, hurt the competitiveness of exporters. Many studies have confirmed this effect (see e.g. Amuedo-Dorantes and Pozo 2004; Loser et al. 2006). Tuano-Amador et al. (2007) find preliminary evidence for some symptoms of the Dutch disease effect in the Philippines.⁴

The higher remittances flows will increase liquidity in financial markets which may push down the interest rate and lead to an expansion of credit. The lower interest rate may invite an increase in expenditure. Increased investment of remittances in real estate or the stock market can push up asset prices which may exert a wealth effect. The total demand impact of an increase in remittances is the sum of these various effects: the direct expenditure effect, the multiplier effect and the interest rate effect will have a positive impact while the exchange rate appreciation could have a negative impact.

An increase in remittances may affect competitiveness also through other channels. An increase in remittances can reduce labor force participation by increasing the level of minimum wages at which members of migrant households are willing to work.⁵ In general, most studies have found that remittances and migration tend to reduce household labor supply and participation, although these effects are sometimes influenced by gender and skill categories of domestic workers (see Mishra 2006).⁶

Moreover, households receiving remittances may use the higher income to reduce work effort and increase leisure or education, which will further reduce the labor supply. The reduction of the labor supply may lead to an increase in the wage level, which will increase production cost and reduce competitiveness (see Acosta et al. 2009; Amuedo-Dorantes and Pozo 2004; Bourdet and Falck 2006; Lartey et al. 2008; Loser et al. 2006; Chami et al. 2003; and Wahba 1998). On the other hand, Yang (2008) finds that the increase in remittances to the Philippines during the Asian crisis in 1997 had no significant effect on the total number of hours worked.

Analysis of remittance flows suggests that they are dependent on external macroeconomic fundamentals. Though stable compared to other flows, workers'

⁴ Using data from first quarter 2000 to fourth quarter 2007, Amador et al. (2007) found that the strong remittance trend may have contributed to the appreciation of the peso in real terms. They also found that there appears to have been a shift in output and employment away from the tradable goods sector toward the non-tradable goods sector. However, exports of manufactures as a percentage of GDP have remained broadly steady. The study further noted that these apparent symptoms of the Dutch disease in the Philippines were not accompanied by the sharp decline in economic growth.

⁵ In literature, this wage is often referred to as reservation wage.

⁶ There is an implied association between higher remittances and migration. The association between higher remittances and migration emphasizes the role of altruism and family ties as a motivation for remittances. Bouhga-Hagbe (2004) looks at migrants and overseas workers who send regular remittances in their home country. Bouhga-Hagbe (2004) implies that an overseas worker or migrant, with some degree of "attachment" to his home country, maximizes welfare by allocating his income between consumption in the country of residence, family consumption in the home country, acquisition of financial assets in the country of residence, and acquisition of non-financial assets, such as real estate, in the home country (also see Chami et al., 2003). Such "attachment" to home country typically leads to higher remittances.

remittances can suffer when the exchange rate of the home country appreciates against the source country. Remittance recipients can see their real purchasing power eroded, or may worry about possible future fluctuations. This creates potential concerns for central banks in improving the environment for workers by smoothing proceeds from remittances. These could also involve transfer of currency risk from migrants or workers to the central bank or through commercial hedging. Given the impact of currency fluctuations on remittances, there may be a case for promoting instruments to mitigate the risk.

The net effect of all these effects on the output gap is an empirical matter. If the positive demand effect and labor supply effects dominate the negative export competitiveness effect, the output gap will tighten.

The increase in remittances will also have an effect on inflation. The demand pressures generated by the higher expenditure will push up prices and the adverse labor supply effect may push up wages while the exchange rate appreciation will reduce the domestic prices of imported goods. If the demand pressures dominate, inflation will increase.

A monetary authority that follows a Taylor rule will respond to these changes. If indeed the output gap tightens and inflation rises in response to an increase in remittances, the policy rate should be increased. And if the whole process of adjustment would indeed lead to a deterioration of the current account balance the need for a tighter monetary policy would further increase. It is possible that the central bank is also concerned about the exchange rate and would be worried that the appreciation of the exchange rate would undermine the competitiveness of the export sector. Such a concern could reduce the willingness to increase interest rates.

For the period 1970-1999, Chami et al. (2006, 2003) showed that in the case of the Philippines, remittances are not profit-driven but are compensatory in nature, and hence, have a negative correlation with growth. The BSP re-estimated the same equation using ordinary least squares (OLS) and revealed that such relationship fades away when the appropriate correction is made for serial correlation (Dakila and Claveria 2007). Tuaño-Amador et al. (2007) do a simple correlation test between (de-trended) GDP and remittances and conclude to pro-cyclicality. Dakila and Claveria (2007) come to the same conclusion using VAR analysis. Using an economy-wide macro econometric model of the Philippines, Bayangos and Jansen (2010) find that OF remittances are pro-cyclical not only with the Philippine output but with those of major host countries, including the United States.

All in all, this section highlights that the impact of remittances on the macro economy is complex.

3. Going with Philippine remittances: recent trends

The magnitude of remittances to the Philippines has been significant, both in absolute terms and as a ratio of nominal GDP and other economic indicators (Table 1). In 2010, remittances reached US\$18.8 billion and the latest available data for 2011 (January to November) showed remittances at US\$18.3 billion.⁷ Recorded remittances were around 5.2% of GDP in 1996 and increased significantly to a level of around 9.4% of GDP in 2010. In real terms, the level of remittances has increased by 221.1% from 1980 to 2010.

Meanwhile, as implied in Section 1, overseas Filipino remittances appear to be relatively more stable than other financial flows since 1996. The annual volatility of remittances in Figure 1, based on the coefficient of variation, is higher than exports of goods and services, but lower than foreign direct investments and portfolio investments. A closer look at covariance from 1996 to March 2011 among remittances and other financial flows such as exports of goods and services, foreign direct investments, portfolio and foreign borrowings, using Kendall tau's test, shows that remittances appear to show significant (at 5% level of significance) negative divergence from exports of goods and services and foreign borrowings.⁸ On the other hand, remittances fluctuate with portfolio and foreign direct investments positively, albeit insignificant at 5% to 10% levels of significance. These findings may indicate that although remittances are relatively more stable, they may actually amplify shocks. When a Granger causality test is used, the findings reveal that there is bi-directional causality between remittances and exports of goods and services at 5% level of significance. The results also show that remittances Granger cause foreign borrowings at 5% level of significance.

The financial crisis that started in 2007 originated in the advanced countries but developing countries are feeling the impact strongly. While merchandize exports and foreign investments have moderated, many emerging and developing countries are now placing their hope on workers' remittances which are presumed to be a more stable financial flow. Studies have shown that the volatility of remittances is less than that of most other financial flows to developing countries. Even so, remittances did not escape the impact of the global financial crisis: the World Bank's Global Economic Prospects 2009 observes that while remittances accounted for 2% of recipient country GDP in 2007, this fell to 1.8% in 2008 and is projected to decline further to 1.6% in 2009 (World Bank GEP 2009, 16 and 38). Even in more normal times remittances do fluctuate from year to year and, for countries where remittances are a large share in GDP, such fluctuations may well be of macroeconomic significance and a matter of concern to policy makers.

Data from the Philippine Overseas Employment Administration (POEA) showed that Filipino workers continued to be deployed abroad, offsetting the job losses resulting from social unrest in the Middle East and North African (MENA) region and the disasters that occurred in Japan. Such developments, combined with the growing presence of bank and

⁷ The BSP records the remittances that flow through the banking system but there are informal channels along which the transfers are made (an example is the door-to-door transfer). Based on the latest available data from the BSP, the share of overseas remittances channelled through the informal sector has declined over the years.

⁸ The Kendall tau's test results are as follows with the probability in parenthesis: XGS -0.32 (0.09), FDI 0.17 (0.39), PORT 0.08 (0.72) and BOR -0.39 (0.04).

non-bank money transfer channels both locally and internationally, as well as the expanding variety of products and services offered by the remittance networks, have enabled overseas Filipinos to send a higher value of remittances using more innovative financial services in the market.

In particular, POEA data indicated that the total number of deployed overseas workers for the period January-December 2010 grew by 3.4% to 1,470,826 from 1,422,586 in the same period a year ago. Of the total deployed overseas workers (new hires and rehires), 76.4% were land-based workers. Annual growth of deployed workers averaged about 5% for both land-based and sea-based workers (1999 to 2010, 4.99% for land-based workers and 5.12% for sea-based workers) (Figure 2).

The sources of remittance flows are geographically diverse, broadly reflecting the pattern of migration flows.⁹ In 1985 to 1989, the Middle East and the USA accounted for around three quarters of total remittances. Later the share of the Middle East declined but in the period 2000-2007 these two regions still accounted for about two thirds of total flows. Other significant source countries include Canada, the United Kingdom, Italy, Singapore, Japan, and Hong Kong.

Tuano-Amador et al. (2007) presented three major factors behind the uptrend in OF remittances since 1996. One, there is a trend rise in the number of deployed workers and emigrants. For another, there has been a change in the skill composition of Filipinos workers and migrants. From 1995 to 2007, there was a significant rise in the number of deployed Filipino workers in the services and professional categories. And thirdly the measures adopted by the BSP and the banks to encourage OFs to channel their remittances through the financial system, including the technological advances in communications that facilitate international money transfers, contributed to the rise in remittances since 1996. The BSP's initiatives are geared toward enhancing transparency and promoting competition in the remittance market; improving access to financial services, especially the transfer of funds to beneficiaries in remote areas of the country; encouraging OF and their families to increase savings and investment; and increasing financial literacy among OF and beneficiaries. Based on the latest available data from the BSP, the share of overseas remittances channeled through the informal sector has declined over the years, probably as a result of these reforms.

A Granger causality test from March 2001 to March 2011 is employed to determine whether changes in remittances (REMIT) are useful in explaining the behavior of other macroeconomic indicators: inflation (2000 base), real personal consumption expenditure (PCE), real disposable personal income (DISY), real money supply (MS), real bank deposit liabilities (DEPLIAB), nominal peso-dollar rate exchange rate (FXR), current account balance (CA), overnight RRP (RRP), 91-day Treasury bill (TBILL), labor force (LF) and compensation

⁹ Data are not truly reflective of the actual source of remittance of overseas Filipinos (OFs). The common practice of remittance centers in various cities abroad is to course remittances through correspondent banks mostly located in the United States. On the other hand, remittances coursed through money couriers cannot be disaggregated into their actual country source and are lodged under the country where the main offices are located, that is, Canada. Therefore, the United States and Canada appear to be the main sources of OF remittances since banks attribute the origin of funds to the most immediate source.

index for non-agriculture workers (1985 base). Except for RRP and TBILL, all variables are in logarithms. These variables are taken from the BSP database.

The Granger causality results show that there is bi-directional causality between remittances and real personal consumption, real disposable personal income, real deposit liabilities, overnight BSP borrowing rate, inflation, Philippine real GDP, labor force, non-agriculture compensation. This analysis shows that remittances are an important force in the Philippines with impacts on many aspects of the economy. It can be highlighted that the Granger tests conducted in this exercise deal only with bi-variate relationships and that, in fact, a full-fledged macroeconomic model in which the main characteristics of remittances are taken into account is more insightful.

To have an initial insight into the relevance of the interest rate (overnight policy rate) channel of monetary policy in the face of significant remittances, this study uses an ordinary least squares (OLS) and generalized method of moments (GMM) single equation regression.

In particular, the short-term interest rate (91-day Treasury bill rate in the secondary market), long-term government bond yield (25-year Treasury bond rate in the secondary market) and average bank lending rate are regressed on (1) BSP overnight borrowing rate, (2) average nominal exchange rates, (3) budget deficit scaled to nominal GDP, (4) year-on-year expected inflation, (5) risk premium on the long-term bond (difference between 10-year note and 10-year US note), (6) remittances scaled to nominal GDP and an (7) interaction term between the BSP policy rate and ratio of remittances to nominal GDP.

Table 1a: Summary of Regression Results

Indicators	Ordinary Least Squares ¹⁰ (Coefficients)	Generalized Method of Moments ¹¹ (Coefficients)
91-day Treasury bill rate	0.805	0.542
25-year Treasury bond	0.515	0.480
Bank lending rate (average)	0.643	0.514

The regression results, as summarized in Table 1a, support a significant impact of the policy rate even if we take into account the impact of remittances. The study shows that overnight borrowing rate, exchange rate and expected inflation rates have significant impact on the 91-day Treasury bill rates. While for long-term Treasury bond rates, the coefficients on exchange rates, risk premiums, share of remittances to nominal GDP, and the interaction term between the policy rate and share of remittances to nominal GDP are highly significant. In the case of the average bank lending rate, the result suggests that the overnight policy and the 91-Treasury bill rates have significant impact on the bank lending rate.¹² The estimation suggests that once the impact of remittances is taken into account, the policy rate pass-through coefficients tend to moderate, but not enough to completely

¹⁰ The signs and magnitudes of individual coefficients in the equation, *t* statistics, the adjusted R^2 , Durbin Watson and *F* statistics are all examined. In general, the single behavioral equation passed these tests.

¹¹ The signs and magnitudes of individual coefficients in each equation, *t* statistics, the adjusted R^2 , Durbin Watson, *F* statistics and J test are all examined. In general, the single behavioral equation passed these tests.

¹² In the regression result, the interaction term between the BSP overnight borrowing rate and remittances scaled to GDP was not significant. This means that the overnight and Treasury bill rates have direct impact on the bank lending rate.

eliminate the effectiveness of monetary policy through the interest rate transmission mechanism.

The existing studies often apply a single-equation regression to test the impacts but that may offer only limited insight in complex adjustment processes. The approach of this paper is to use a more complete macroeconomic model that includes the relevant institutions, markets, and agents and the various interactions between them. It can be argued that this gives a better insight into the impact of remittances on economic growth.

When studying the impact of migration and remittances, we have to deal with the issue of endogeneity. Remittances are part of GDP as they immediately are reflected in expenditure and this leads to a positive correlation that does not mean very much. Most studies use the two-stage least squares (instrument variable) and the GMM approach. In our model, we used the same methods to address the issue of endogeneity. In the next section, we introduce a full-fledged macroeconomic model in which the main facts around remittances are integrated.

4. Tracing the impact of remittances on growth and inflation

In this section, we identify various channels along which remittances could affect the growth of the Philippine economy. To test the relevance of these channels and to examine whether the monetary policy transmission mechanism in the Philippines has been effective in the face of surge in overseas remittances, this study extends the Bayangos and Jansen (2011) quarterly macro econometric model for the Philippines to examine the monetary policy pass-through effects from 1999 to 2011. Figure 3 traces the impact of changes in remittances on growth and inflation.

4.1 The nature of the model

The underlying analytical structure of our model shares features with the New Keynesian model of Ball (1999). The Ball (1999) model is designed to analyze monetary policy under inflation targeting and abstains from any optimizing foundation. Central to this model are important nominal rigidities in describing the macroeconomy. In addition, there are lag effects in the transmission mechanism. We assume that aggregate output is demand-determined in the short to medium run. Goods markets are monopolistically competitive (Blanchard & Kiyotaki 1987), leading to profits for firms that charge non-competitive sticky prices (Calvo 1983), which clear all of domestic production to satisfy demand (net of imports) for consumption, investment, government spending, and exports. Firms use a mark-up when setting prices which are responsive to demand and monetary conditions. Meanwhile, households and firms negotiate a non-competitive real wage, engaging in sticky nominal contracts (Calvo 1983).

Asset markets are imperfect. The nominal exchange rate is allowed to transitorily deviate from purchasing power parity (PPP) so that movements occur in the real exchange rate. In addition, nominal short-term interest rates play the leading role as the channel of monetary policy, with the money supply having a limited role in describing the monetary

stance. The model is designed to trace how the Philippine economy reacts to shocks and to policy interventions. Fiscal policy is introduced in the model through discretionary changes in government spending. The main attention in the model is to monetary policy as this is crucial for the changes in interest rates and the exchange rate.

The main features of the monetary block of the model are the following: (1) the policy interest rate of the BSP follows a policy rule that responds to inflation, output gap, and exchange rate pressures; (2) changes in the BSP policy rate affect the nominal exchange rate based on the uncovered interest parity (UIP) condition; and (3) the nominal peso-dollar rate is an effective transmission mechanism, as both direct and indirect pass-through effects to inflation are above average.

The model is largely demand driven. In the expenditure block, private consumption expenditures are mainly determined by disposable income. Private investment is driven by output growth, interest cost and the exchange rate and export demand is determined by foreign income and the real exchange rate. All the changes in spending behavior, when added up across the whole economy, generate changes in aggregate spending. Total domestic expenditure plus the balance of trade in goods and services reflects the aggregate demand in the economy, and is equal to gross domestic product (GDP).

Potential output and the resulting output gap as measure of future inflationary pressures have regained importance under the inflation targeting framework. Output gap is estimated based on Dakila (2001) in which it is expressed as the difference between the log of a one quarter moving average of supply side GDP (deseasonalized series) and potential output.¹³

Aggregate demand translates into demand for labor. On the labor market this demand is confronted with supply to determine unemployment and wage pressures. The output gap then feeds into the wholesale price index. The wholesale price index is affected by the average prices of merchandise imports in pesos, the excess liquidity as indicated by money supply relative to gross domestic product, the average compensation (wages) for industry and services sectors and the output gap. This specification makes the pricing decision based on a flexible mark up.

The main link between monetary policy and wholesale price index, and consequently inflation is the output gap. Hence, there is an impact of monetary policy on expenditure. In addition, the real money supply strengthens the link to price level and consequently between monetary policy and the production sector.

Meanwhile, changes in the wholesale price drive prices of the industry and services sectors, and finally the final demand prices. Final demand prices are contained in the implicit GDP deflator. This then is the basis of headline inflation.

¹³ Potential output is derived by applying an HP-filter technique on quarterly actual GDP from first quarter 2000 to second quarter 2011.

Because of the forward-looking nature of inflation targeting, the role of inflation expectations in this transmission mechanism becomes crucial. Indicators of inflation expectations include the two-year ahead inflation forecast.

The estimation of long-run inflation expectations follows a hybrid structure that contains both forward-looking and backward-looking expectations. The structure includes rational component of inflation, indicated by the medium-term (three to five years) inflation target announced by the Government and contemporaneous and inertial components indicated by current and past inflation rate. The rational component is based on Demertzis' and Vieggi's (2005) work on inflation targets as focal points for long run inflation expectations. The idea is that in the absence of concrete information of inflation expectations, the only information that agents have is the quantitative inflation target announced by the Government.

4.2 Remittances and the economy

All the interactions described so far are rather standard for this type of model. However, for a country like the Philippines, where remittances are significant, we need to go further to capture the full macroeconomic dynamics.

$$R_t = \alpha + \delta C_t + \beta(r_t - r_t^f) + \theta Y_t^f + \varepsilon_t. \quad (1)$$

Remittances are positively related with consumption C_t , indicating that remittances do not stabilize consumption as found in some other studies.¹⁴ This relationship indicates that remittances increase when demand for consumption accelerates and they decrease when demand for consumption deteriorates. We look at interest rate differential between local and international rates ($r - r^f$) to determine whether investment considerations are at play.¹⁵ In addition, we look at the income of host countries Y^f to capture the cyclicity of remittances with the income of host countries: remittances vary with the business cycle of the host countries, in good times employment opportunities and wages are better allowing migrant workers to transfer more.

$$Y_t^d = (1 - t)Y_t + R_t. \quad (2)$$

Following Chami, Fullenkamp & Jahjah (2003), equation 2 shows that remittances add to disposable income Y^d and, through this, to real private consumption expenditure C_t in equation 3. Disposable income is computed as income (or GDP, Y_t) less tax.

$$C_t = \alpha + \delta Y_t^d + \lambda M_t - \theta(r_t^d - \pi_t^e) + \varepsilon_t. \quad (3)$$

¹⁴ The literature on the cyclicity of remittances flows is inconclusive with some studies finding evidence for countercyclical patterns and others for pro-cyclicality (see Bayangos and Jansen 2011a).

¹⁵ Following discussion in Section 3 and for simplicity, the insurance motive of remittances is assumed away.

Consumption demand is also determined by the money supply (M) and the real interest rate ($r_t^d - \pi_t^e$). Part of the increased consumption demand is for imported goods, and affects the trade balance, while the rest is on domestic goods and may push up their prices.

The impact of an increase in remittances on investment demand is complex. The increased demand for domestic goods would lead to an increase in investment demand but remittances also affect variables like wages, interest rates, exchange rate that also play a role in the investment decision. The increase in wages induced by remittances will reduce profitability and thus reduce investment demand. Remittances also affect market interest rates and thus the cost of investment. The appreciation of the exchange rate will make imported capital goods cheaper which would push investment demand. The net outcome of all these factors is difficult to predict but in our model runs the net effect of an increase in remittances is a rise of investment. It is sometimes suggested that remittances may be used to finance residential construction. To date, we have not found a formal study on the relationship between remittances and residential construction for the Philippines.¹⁶

Since overseas remittances are channeled through the banking system, the impact of remittances is seen as directly affecting monetary conditions: an increase in remittances is reflected in an increase in deposit liabilities D_t in equation 4.

$$D_t = \alpha + \pi R_t + \varepsilon_t. \quad (4)$$

Deposit liabilities are then added to currency in circulation to arrive at total domestic liquidity. Equation 4 shows that bank deposits are driven by remittances so that any change in remittances will have an impact on total domestic liquidity. However, this specification is an empirical issue. The magnitude of the impact of movements in remittances on deposit liabilities will depend on consumption response. It will also depend on whether the central bank will respond by tightening of monetary policy with the rise in remittances.

The model also traces the impact of remittances on the labor market. Remittances are generated by OFs and an increase in remittances receipts is thus associated with an increase in emigration and a reduction of the domestic labor supply. The labor force in the model, defined as the proportion of the population (15 years old and over) who are considered able to contribute to the production of goods and services in the country, is determined by demographic trends (population of working age) and the level of wages. Every year a significant number of people leave the country cutting into the remaining population of working age which in turn may potentially reduce labor supply. Furthermore, as suggested by the studies, remittances receiving households may use the higher income to opt for more leisure or more schooling which may further reduce the labor supply. Our regression results show that variations in remittances have a significant effect on the labor force.

¹⁶ This limitation may due to data constraints.

$$L_i = \alpha + \varpi A - \delta R_i + \lambda W_i + \varepsilon_i. \quad (5)$$

Equation 5 shows that an increase in remittances R will have a negative effect on labor force L . In addition, working age population (ages 15 years old and above) A and wages W will have positive impact on the labor force.¹⁷

The increase in remittances is thus associated with an increase in aggregate demand and thus also of demand for labor but with a decline in the labor supply, a fall in unemployment and, since the level of unemployment is an important determinant of wages, an increase in wages. Wages feed into production cost and sectoral production prices and through these to wholesale and retail price inflation.

The Dutch disease effect is also captured by the model. The effect could be seen through the exchange rate effects.

$$e_t^n = \alpha - \beta T + \delta(r_t^f - r_t) + \varepsilon_t. \quad (6)$$

The estimation of equation 6 follows the convention in which an increase in the nominal peso-dollar rate e^n corresponds to a depreciation rather an appreciation of the peso. The BSP maintains a freely floating peso, whose value is determined, to a great extent, by supply and demand factors. The nominal exchange rate is sensitive to the level of the current account balance T and to the interest rate differential $(r_t^f - r_t)$. The direct effect of an increase in remittances on the current account is positive leading to an appreciation, but there are also indirect effects on exports (through the impact of remittances on competitiveness) and on imports (through the increase in domestic demand that remittances generate) and the overall impact of an increase in remittances could be a deterioration of the current account balance which would lead to a depreciation of the nominal exchange rate.

There is also an indirect effect through the financial markets. The remittances inflow increases liquidity in financial markets which exerts downwards pressure on market interest rates. But the remittances also lead to an increase in spending, and thus a fall in the output gap, and in an increase in inflation. These changes induce the central bank to increase the policy rate and this pushes up the market interest rate. The net effect is an empirical matter. If, on balance, the market rate rises, the gap between local and global interest rates gap falls and the nominal exchange rate appreciates.

¹⁷ In developing countries like the Philippines there may be an excess supply of labor and it could be argued that people migrate because there is not much to do at home. If that is so, the reduction of the labor force need not increase wages. However, there are three arguments against this. First, as there is no social security, unemployment is not an option: every person has to do something to make a living, even if only a low productivity informal sector job. They migrate not because there is nothing to do but because they can earn more abroad. Moreover, as indicated earlier, emigration from the Philippines is quite substantial relative to the labor force. And, thirdly, emigration increasingly concentrates on skilled workers and does create shortages in these segments of the labor market. There is thus good reason to expect an impact of migration on wages and that is what is implied in the econometric analysis. As argued in some studies, the rise in wages may be compensated by increased productivity due to better use of labor, investment in labor-saving technology, and improved skill levels.

The change in the real exchange rate is determined by the change in the nominal exchange rate and the change in relative prices. As the increase in remittances lead to higher demand pressures, local prices increase, inducing an appreciation of the real exchange rate. Exports suffer from an increase in remittances as the real exchange rate appreciates.

We can now see how remittances complicate policy making, in particular monetary policy. The transmission mechanism starts with the BSP's domestic interest rate policy. The BSP uses the overnight reverse repurchase rate (RRP) r^P as its policy instrument and follows a policy rule to anchor inflation in the long run (Clarida et al. 2000). The overnight RRP adjusts to inflationary pressure measured by the difference between the inflation forecast and the inflation target announced by the Government and the output gap.¹⁸). This is seen as,

$$r_t^P = \alpha + \beta(\pi_t^f - \pi_t^*) + \rho(q_t - q_t^*) + \varepsilon_t, \quad (7)$$

where r^P is the RRP, α connotes the neutral monetary policy stance, π^f is the one-quarter ahead inflation forecast, π^* is the medium-term inflation target announced by the Government, q is real output, q^* is potential real output and the error term is ε_t . In the empirical strategy, parameters in equation 7 are estimated using GMM.

The RRP rate is transmitted to the benchmark interest rate, r , through the natural arbitrage condition. In this model, the benchmark interest rate is the 91-day Treasury bill rate. As seen in equation (8), r is also affected by other variables, such as the inflation rate π , foreign interest rate r^f , nominal deposit liabilities M and an error term ε .

$$r_t = \alpha + \beta r_t^P + \rho \pi_t + \gamma r_t^f - \mathcal{M}_t + \varepsilon_t, \quad (8)$$

Equation 8 states that the benchmark interest rate is higher, the higher the RRP rate, the higher the inflation rate, the higher the foreign interest rate, and the lower the level of money supply. In this equation, there is a direct channel from the BSP's policy rate to the benchmark interest rate. Remittances affect the benchmark rate as they affect liquidity on financial markets and thus the money supply.

Changes in the benchmark interest rate are then carried over to the changes in the other market interest rates, such as bank lending rate ¹⁹ through the natural arbitrage condition. It is also assumed that the short-run domestic inflation is relatively sticky, indicating that inflation expectations for the short term are similarly sticky. This further implies that by controlling the nominal overnight RRP rate, the BSP can also affect the short-

¹⁸ In Bayangos and Jansen (2011 forthcoming), the expected exchange rate gap (the difference between the expected exchange rate and realized exchange rate) is included.

¹⁹ In the empirical estimation, the overnight RRP rate takes an indirect instrument in affecting bank lending rate.

term real RRP rate or the difference between the short RRP rate and short-term inflation expectations. Through market expectations of future real rates, longer real rates (that is, longer than overnight rates) also are affected. Thus, the lowering of the overnight RRP is expected to lower short and longer real interest rates, and consequently affect economic activity.

Changes in the *RRP* rate and their impact on domestic market interest rates affect changes in the nominal exchange rate (see equation 6 above). Remittances affect the nominal exchange rate through their impact on the domestic interest rate and thus on the interest rate differential. Moreover, remittances can affect the real exchange rate when demand pressures push up prices of nontraded goods.

We can conclude that the endogenous remittances may lead to a complex adjustment process and sets considerable policy challenges. An increase in remittances is expected to push up private consumption and reduce exports while the effect on investments remains an empirical question. On balance, aggregate demand is seen to increase and the output gap is likely to narrow.

The narrowing output gap generates inflationary pressures which are aggravated by the impact of remittances on wages and on the money supply but are mitigated by the impact on the interest rates, which reduces interest cost, and on the exchange rate, which reduces the cost of imports. But again, on balance the inflationary pressures increase.

The narrowing of the output gap and the increase in inflationary pressures force the central bank to increase the policy rate at a magnitude that is greater than what it would have been in the absence of remittances, because of the downward impact that increasing remittances have on market interest rates. On the other hand, the fact that remittances lead to an appreciation of the exchange rate may make the central bank reluctant to raise the policy rate.

The higher interest rates attract more remittances (equation 1) and a further appreciation of the exchange rate (equation 6). A central bank trying to stabilize the output gap, inflation and the exchange rate will find it difficult to achieve all the objectives when remittances are substantial.

4.3 Structure of the model, diagnostics and model solution

The analytical framework developed in Section 4.2 yields a system of 29 simultaneous equations.²⁰ The 29 equations represent the major sectors of the Philippine economy, namely, the monetary and external sectors, the fiscal sector and the real sector. For this paper, the model has been extended to include the various channels along which remittances (particularly the monetary policy pass-through) affect growth and inflation.

The 29 simultaneous equations are estimated using single-equation methods: five are estimated using generalized method of moments, 13 are estimated using two-stage

²⁰ The complete specification of the basic version of the model is found in Bayangos (2007): Chapter 5, Bayangos (2011a) and Bayangos (2011b).

least squares and the remaining 11 equations are estimated using ordinary least squares. The choice of instruments for the two-stage least squares is assumed to be all the lagged endogenous variables and all current and lagged exogenous variables in the whole system.

Each of the 29 simultaneous equations is assessed for basic and higher-order diagnostic tests. The signs and magnitudes of individual coefficients in each equation, such as t statistics, the adjusted R^2 , Durbin Watson and F statistics are all examined. In general, all of the behavioral equations pass these tests. In particular, the adjusted R^2 values for all equations are greater than 60% and values in all equations suggest there is no penalty for the number of explanatory variables used. All calculated F values are higher than the critical values, at the 5% to 10% level of significance, thereby indicating a significant degree of reliability of coefficients of determination.²¹

Results of higher order test statistics of residuals are similarly examined. Higher order diagnostic tests start with the Jarque-Bera test. This test is designed to ascertain whether the series is normally distributed. Results show that all of the series are normally distributed. With a lag order of up two and at 5% to 10% level of significance, Breusch-Godfrey results show that not all equations exhibit serial correlation. There are equations which initially exhibit serial correlation but for which additional lags are incorporated to make the residuals stationary.

White's heteroskedasticity test in the residuals is also used. White's test is a test of the null hypothesis of no heteroskedasticity. Using the 5% to 10% level of significance and in general up to two fitted items, RESET results reveal that there are no specification errors in equations. J-test is also checked for four equations estimated using GMM at five to 10 per cent level of significance. Results show that the four equations are over-identified and are therefore valid equations.

Solving a system simultaneously is indeed difficult. Both deterministic and static simulations are performed using the Fair-Taylor method.²² This is an iterative algorithm, where each equation in the model is solved for the value of its associated endogenous variable, treating all other endogenous variables as fixed. Meanwhile, terminal conditions are assumed to hold in a specified time period. Put simply, this means that the values contained in the actual series after the end of the forecast sample are used as fixed terminal values. Forward solution is similarly used for equations that contain future (forward) values of the endogenous variables.

To gauge the simulation and forecasting performance of the model, the mean absolute percent error (MAPE) of selected endogenous variables is computed. As a general rule, the smaller the MAPE the better the fit of the model to the actual data is. The model's forecasting performance over parts of the sample period and the simulated response to

²¹ Exact collinearity is similarly checked. Highly collinear regressors lead to spurious estimates. There are a few cases though where exact collinearity is encountered especially when dummy variables are used, however, a re-specification of some of these equations are done.

²² In technical terms, this is called the Gauss-Seidel algorithm method.

some exogenous changes in policy variables are assessed. The simulation period extends from the first quarter of 2004 to the fourth quarter of 2008.²³

5. Finding and implications for monetary policy

5.1 Findings

The regression results are shown in Table 2. The strategy this paper follows to assess the impact of large remittance transfers on the Philippine transmission mechanism is straightforward. To capture the impact of significant remittance flows, a sustained US\$ 1 billion increase in remittances is simulated on the estimated macro model over a five-year period (first quarter 2004 to fourth quarter 2008). Table 1 shows that this is a substantial increase; the outstanding amount of remittances more than doubled while annual growth averaged to about 10% from 2004 to 2008. Of course, remittances are endogenous in our model; the increase in remittances is generated by increasing the (exogenous) income of host countries (see equation 1 above). Annualized quarterly growth from baseline scenario as well as volatility using the coefficient of variation (CV) is computed.²⁴

Table 3 presents the results of the simulation. The simulation shows that the increase in remittances leads to a decline in export growth. The simulation results show the various channels through which the impact of large remittances takes place. First, labor force growth declines as workers emigrate and reduce work effort. This has a positive effect on unemployment but leads to a growth in wages (the non-agricultural compensation index).

There is a significant appreciation of the nominal exchange rate. This is caused by the inflow of foreign exchange but also by the interest rate effect. The inflow of foreign exchange does, in the first instance, increase liquidity on the money market and this places a downward pressure on the interest rate. But there is a monetary policy effect as well: the increase in remittances stimulates aggregate demand. As a result the output gap falls and inflation accelerates. The central bank is following a Taylor policy rule and thus responds by increasing the policy rate and this pushes up the market interest rates such as the Treasury bill rate and bank lending rate. As Table 3 shows this policy effect is strong leading to the rise in market rate. This in turn widens the interest rate gap with the international interest rate, leading to a further appreciation of the nominal exchange rate.

The increase in remittances translates into a significantly faster growth of private consumption expenditure, which is also fuelled by the increasing wages. In section 2 it was noted that rising wages imply a lower return on capital and thus a reduced investment

²³ In our model, the major macroeconomic variables can be predicted within reasonable error margins. Using generalized method of moments, two-stage least squares and ordinary least squares, about 89% of the MAPEs of our dynamic models fall below 10%. These include key variables in the monetary and real sectors, like the consumer price index (*CPI2000*), remittances (*REMIT*), labor force (*LF*), 91-day Treasury bill (*TBR91*), and the nominal peso-dollar rate (*FXR*). For instance, *CPI2000*, *LF*, *TBR91*, *REMIT*, and *FXR* have a MAPE of, respectively, 0.91%, 1.43%, 5.12%, 5.15% and 8.11%. These results indicate that the simulation properties of the model are reasonable.

²⁴ Volatility is a measure of how wild or quiet an indicator is relative to its history. The CV is a comparative measure defined as the ratio of the standard deviation to the mean.

demand. The increase in the market interest rates will further discourage investment. Still, in the simulation investment grows. This is due to the aggregate demand effect. The inflow of remittances and the resulting higher domestic spending invites capital formation to create the necessary production capacity. The appreciation of the exchange rate makes (imported) capital goods cheaper which also helps to increase investment.

The faster growth of consumption and investment demand exerts pressure on prices; there is a slight acceleration of inflation. The acceleration of inflation means that the real exchange rate appreciates more than the nominal one.

The volatility measure in Table 3 indicates that the BSP's reaction towards inflationary pressure, output gap and exchange rate fluctuations generated, from the baseline, lower volatility of inflation, the two-year-ahead inflation forecast, long-run inflation expectations and output gap but higher in the nominal peso-dollar exchange rate. As real GDP growth slowed and the output gap widened, lower volatility compared to the baseline was seen.

5.2 Implications for monetary policy

The findings in Section 5.1 suggest several implications for monetary policy.

First, remittances have a positive impact on major Philippine economic indicators. Simulations show that an increase in overseas remittances to the Philippines will increase consumption, investment, money supply, labor productivity and economic growth. The results also indicate that a large increase in remittances may lead to a change in the economic structure, in particular, a decline in traded goods production and exports. These findings underscore the continuous need for the BSP to take endogeneity into account when formulating monetary policy.

Latest indicators using the flow of funds show that remittances continue to drive household consumption. In the 2009 Flow of Funds (FOF) Report, the household sector remained the prime saver in the economy for two consecutive years (2008 and 2009).²⁵ Accumulated savings of the household sector were boosted partly by the steady inflow of remittances from overseas Filipinos, despite the economic difficulties faced by their host economies. The sustained increase in income, combined with the slowdown in the growth of personal consumption expenditures, contributed to the 36.8% growth in the accumulated households' savings. These findings indicate that beneficiaries of OFs may boost personal consumption over the ensuing years.

Second, this paper's preliminary finding that remittances respond to investment opportunities in the Philippines as much as to altruistic and insurance considerations, suggests a crucial role for the BSP to improve the remittance environment and to encourage

²⁵ The FOF presents a summary of financial transactions among the different institutions of the economy, and between these institutions and the rest of the world. It identifies which institutions are net borrowers and net lenders in the series of financial transactions. Institutions are categorized into four, namely, financial corporations, non-financial corporations, the general government, and the household sector.

OF beneficiaries to channel remittances to productive undertakings.²⁶ The BSP undertakes various bank-related initiatives to improve the remittance environment and to guide remittances to productive endeavors. Through these initiatives, the BSP intends to maximize the benefits of remittances aimed at ensuring the smooth inflow of remittances and promoting their use for development by channeling them to the financial sector so that these funds can be mobilized for lending and other productive activities.²⁷ These initiatives helped in the promotion of a culture of savings among the beneficiaries of OFs and encouraged them to channel these savings into investments in financial instruments and business ventures.

Third, the simulation results imply that the labor market effects of emigration and remittances are equally significant. This result may suggest that labor market effects can be used to explain competitiveness that goes beyond the traditional exchange rate effect.²⁸ Emigration cuts into the labor force and the receipt of remittances further reduces labor supply. This could occur as households receiving remittances may use the higher income to reduce work effort and increase leisure or education, which will further reduce the labor supply. There is a strong effect on wages which will increase production cost and reduce competitiveness. The impact of the higher wages on competitiveness is mitigated by the sharp increase in labor productivity (measured as the difference between real output growth and labor force growth). As the labor force declines output rises implying a more intensive use of labor through a decline in unemployment and underemployment. The tentative conclusion here is that standard macroeconomic policy may not be enough to enhance competitiveness. There is a need for more structural policies to improve productivity, including investment in infrastructure and education, reforms to increase competition on domestic markets and export promotion.

Fourth, another interesting finding of the simulation is the impact of significant remittance transfers on exchange rate. Table 4 shows growth rates of exports, measured in dollars. Many Asian countries follow an export-driven development strategy as reflected in high growth rates for exports and high ratios of exports to GDP. The Philippine year-on-year growth of exports of goods had slowly increased over time to reach a peak of 15.6% in 2006. Since then the year-on-year growth has declined. Following the global financial crisis, exports of goods declined by 22.1% in 2009. There was a resurgence of export receipts though in the second quarter of 2011. Meanwhile, exports of goods and services scaled to nominal GDP stand at 37% in 2008, against much higher ratios for example, Malaysia (110%), Thailand (77%) and Vietnam (78%). The Philippine export ratio had slowly increased over time to reach a peak of 55% in 2000. Since then the ratio has declined to 37%.²⁹ These two facts: the doubling of the remittances to GDP ratio since the mid-1990s and the decline in the export growth and exports to GDP ratio since 2000 may well be related. The

²⁶ Based on the second quarter 2011 Consumer Expectations Survey (CES), the bulk of OF households who used remittances for investments has increased to 6.8% from 5.7% in the first quarter of 2011.

²⁷ In particular, the BSP initiatives to improve the remittance environment are geared towards the following: (1) enhancing transparency and competition to lower remittance charges, (2) improving payments and settlements system to facilitate remittances and help further reduce remittance charges, (3) channeling remittances to financial investments, (4) relaxing access of bank clientele to financial services, and (5) increasing financial education of OFWs and beneficiaries.

²⁸ In a related paper, Bayangos and Jansen (2011b) argued that in the analyzing the impact of changes in remittances on a country's competitiveness, the labor market effects should also be considered on top of exchange rate effects.

²⁹ The data on the export ratios are drawn from the online version of the World Bank's World Development Indicators.

preliminary simulation shows that a significant rise in remittances leads to appreciation of the peso-dollar rate. It should be noted that the recent rapid appreciation of the peso-dollar rate has been driven more by global conditions than domestic conditions.

At present, the BSP monitors the exchange rate movements when setting the policy rate, but, it only moves to dampen the impact of significant exchange rate shocks and not to target the exchange rate. The BSP monitors possible misalignments in the peso by looking at the movement of the real effective exchange rate (REER) to determine if there is a high and persistent deviation from its long-term average trend and whether such movements are supported by economic fundamentals.

On balance, the findings so far indicate that the overall impact on growth of massive remittance transfers to the Philippines appears to be positive.

Fifth, an equally interesting finding is the apparent moderation of the monetary policy pass-through following a significant rise in remittances. This finding brings us to a broader issue of whether the inflation targeting framework has been undermined by large foreign exchange inflows. Table 3 shows that the pass-through of the policy rate to the benchmark rate (91-day Treasury bill rate) and to average bank lending rate appears to have been muted by a surge in remittances. The rise in policy rate (0.50 percentage point) appears to translate to the 91-day Treasury bill rate (at 0.20 percentage point) and to the bank lending rate (at 0.25 percentage point). This also suggests that monetary policy actions feed to average bank lending rate directly than the 91-day Treasury bill rate. Although at different magnitude, this finding is consistent with the initial findings in Section 3. A review of the pricing policy for BSP's standing facilities from 1992 to 2009 also reveals a similar finding. Because of the rejections of bids in the primary auction of Treasury bills, the pass-through from the overnight RRP rate to the 91-day Treasury bill rate appears to be incomplete.³⁰

These results indicate that monetary policy actions continue to be a potent tool in transmitting influence to market interest rates, albeit moderate, in the face of large remittances.

³⁰ To determine the appropriateness of using overnight RRP rate in pricing the volume of overnight reverse repurchase agreement (RRP) and special deposit account (SDA) placements with the BSP, a monthly vector autoregression (VAR) from January 1992 to December 2009 is employed.³⁰ The VAR model is comprised of the following variables: *ERRP* (overnight reverse repurchase rate, in percent), *RRPSDAV* (the natural logarithm of the volume of *RRP* and *SDA* placements with the BSP, in million pesos), *ER* (average nominal US dollar/peso exchange rate), *TBILL* (weighted average of 91-day Treasury bill rate, in percent), *M3_MS* (the natural logarithm of the total domestic liquidity, based on Monetary Survey, in million pesos).

6. Way forward

Remittances to the Philippines have shown considerable resilience to changing global conditions during the past several years. In addition to bolstering the balance of payments, large inflows are supporting the domestic economy. Many of the factors that have attracted them remain in place, suggesting that they will stay on an upward trajectory.

This paper lays out the nature and characteristics of overseas remittances to the Philippines over the past decade or so. The paper then traces the impact of significant changes in remittances and the challenges they create on the transmission of Philippine monetary policy particularly in the short run.

In the assessment of the impact of significant remittance transfers, we should also consider the role of remittances in the transmission channel of monetary policy. Using simulation results from an estimated macro econometric model built for the Philippines from March 2001 to March 2011, the paper reveals interesting insights. A significant increase in remittances will increase consumption, investment, labor productivity and economic growth.

There are also indications that significant increase in remittances may lead to exchange rate and labor market effects. This finding may imply that standard macroeconomic policy may not be enough to address the competitiveness issue. There is a need for more structural policies to enhance productivity, including investment in infrastructure and education, reforms to increase competition on domestic markets, and export promotion. For monetary authorities, continuous adherence to exchange rate flexibility is a reasonable option to address significant remittance flows.

An equally interesting finding is that the policy rate continues to be effective in affecting market interest rates. However, the simulation results also suggest that monetary policy pass-through tends to moderate once we take into account the impact of large remittance flows. This may also imply that calibration of policy rate when remittance flows are massive may not be sufficient as an instrument of monetary policy.

The study also implies that remittance flows to the Philippines are not only important but equally challenging. In the long run, remittances should serve as an opportunity to facilitate medium-term economic growth. The main challenge for the Philippine monetary authorities remains to achieve a balanced, sustainable, and more inclusive pattern of growth.

The issue is how best to channel remittance flows toward financing broader-based growth, and in particular toward boosting investment. The BSP recognizes that a challenge to policy makers to how to provide financial infrastructure and mechanisms for the overseas workers to remit their income to beneficiaries, including strong savings and investment climate, easier access to credit and other financial instruments and active entrepreneurial activities.

A reasonable policy option in the face of significant surges in remittance flows is achieving sound macroeconomic fundamentals which translate into stable prices, a healthy financial sector and fiscal discipline. Such a condition is requisite to developing deeper financial products and stimulating private investment.

Moving forward, although remittance transfers are driven by fundamentals, possible financial imbalances caused by significant remittance transfers may not be remote. In such a scenario, the first line of defense is prudential regulation and close supervision of the banking system. Compliance with Basel II and the development of Basel III proposal are encouraging steps in this direction, particularly the inclusion of higher capital and liquidity requirements. However, care must be taken to strike a right balance between the stability of financial systems and their efficiency. Well-designed regulatory reforms should make financial systems more resilient and stable without stifling growth.

References

1. Alleyne, D., C. Kirton and M. Figueroa (2008) 'Macroeconomic Determinants of Migrant Remittances to Caribbean Countries. Panel Unit Roots and Cointegration', *Journal of Developing Areas* 41(2)[Spring 2008]: 137–153.
2. Bayangos, V. and K. Jansen (2011a) 'The Macroeconomics of Remittances: the Case of the Philippines' (Chapter 13), *South-South Globalization (Challenges and Opportunities for Development)*, edited by Syed Mansoob Murshed, Pedro Goulart and Leandro Serino, Routledge Studies in Development Economics, London, ISBN: 978-0-415-59217-8 (hbk), ISBN: 978203-81451-2 (ebk).
3. Bayangos, V. and K. Jansen (2011b), Remittances and Competitiveness: the Case of the Philippines, *World Development* (forthcoming October 2011), doi:10.1016/j.worlddev.2011.04.019
4. Bayangos, V. (2011), 'Was it credit supply? International claims and cross-border lending to the Philippines during the financial crisis' paper submitted as a country chapter for the SEACEN Research Project on International Claims and Cross-Border Lending and Implications in SEACEN Countries: Balance Sheet Perspectives, April 2011.
5. Blanchard, Olivier J. & N. Kiyotaki (1987) Monopolistic competition and the effects of aggregate demand, *American Economic Review* 77: 647-666.
6. Bouhga-Hagbe, J. (2004) *A Theory of Workers' Remittances With an Application to Morocco*, IMF Working Paper 04/194.
7. Bourdet, Y. & H. Falck (2006). Emigrants' Remittances and Dutch disease in Cape Verde, *International Economic Journal*, Vol. 20, No.3, 267-284.
8. Buch, Claudia M., Anja Kuckulenz and Marie-Helene Le Manchec (2002) *Worker Remittances and Capital Flows*, Kiel Working Paper No. 1130, Kiel Institute for World Economics, Kiel (Germany).
9. Calvo, Guillermo (1983) Staggered prices in a utility maximizing framework, *Journal of Monetary Economics*, 12 (3): 383-398.
10. Chami, R, C. Fullenkamp & S. Jahjah (2003) *Are Immigrant Remittances Flow a Source of Capital for Development?*, Washington D.C.: IMF Working Paper 03/189.
11. Chami, R, A. Barajas, T. Cosimono, A., C. Fullenkamp, M. Gapen and P. Montiel (2006) *The Macroeconomics of Remittances*, IMF Occasional Paper No. 259, IMF, Washington D.C.
12. Clarida, R., J. Galí, & M. Gertler (2000) Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory *Quarterly Journal of Economics* 115: 147-180.
13. Dakila, F. Jr (2001) Alternative Monetary Policy Rules for the Philippines, *Philippine Review of Economics*, Vol. XXXVIII, No. 2 , December.
14. Dakila, F. and Claveria, R. (2007) "Identifying the Determinants of Overseas Filipino' Remittances: Which Exchange Rate Measure is More Relevant?", Working Paper No. 2007-02, Bangko Sentral ng Pilipinas.
15. Demertzis, M. and N. Viegi (2005) *Inflation Targets as Focal Points*, De Nederlandsche Bank (DNB) Working Paper, No. 17. Amsterdam: De Nederlandsche Bank.
16. Giuliano, P. and M. Ruiz-Arranz1 (2005) *Remittances, Financial Development, and Growth*, IMF Working Paper 05/234

17. International Monetary Fund (IMF) World Forecast, “Global Growth Hits Soft Patch, Expected to Rebound” IMF Survey online, 17 June 2011, <http://www.imf.org/external/pubs/ft/survey/so/2011/NEW061711A.htm>.
18. IMF (2011), “Recent Experiences in Managing Capital Inflows—Cross-Cutting Themes and Possible Policy Framework”, Strategy, Policy, and Review Department approved by Reza Moghadam, 14 February 2011.
19. IMF *Global Financial Stability Report* (2011), IMF Washington D.C., U.S.A.
20. IMF Regional Report (April 2011), Regional Economic Outlook
21. Lartey, E. K.K. & F. S. Mandelman, & P. Acosta (2008) *Remittances, Exchange Rate Regimes, and the Dutch disease: A Panel Data Analysis*. Atlanta: Federal Reserve Bank of Atlanta, Working Paper 2008-12.
22. Loser, C., C. Lockwood, A. Minson and L. Balcazar (2006) The macroeconomic impact of remittances in Latin-America – Dutch disease or Latin cure?. *Inter-American Dialogue*.
23. Lueth, E. and M. Ruiz-Arranz (2007) *Are Workers’ Remittances a Hedge Against Macroeconomic Shocks? The Case of Sri Lanka*, IMF Working Paper 07/22
24. Mandelman, F. (2011), “Monetary and Exchange Rate Policy Under Remittance Fluctuations”, Federal Reserve Bank of Atlanta Working Paper, 2 March 2011.
25. Mishra, P. (2006) *Emigration and Wages in Source Countries: Evidence from Mexico*. IMF Working Paper WP/06/86
26. Prasad, E., K. Rogoff, S. Wei and M.A. Kose (2003) *Effects of Financial Globalization on Developing Countries: Some Empirical Evidence*, IMF, Washington DC.
27. Sayan, S. (2006) ‘Business Cycles and Workers’ Remittances: How Do Migrant Workers Respond to Cyclical Movements of GDP at Home?’, IMF Working Paper 06/52.
28. Tuaño-Amador, C., R. Claveria, F. Co and V. Delloro (2007) ‘Philippine Overseas Workers and Migrants’ Remittances: the Dutch disease Question and the Cyclicity Issue’ in *Bangko Sentral Review*, Volume IX, Number 1, pp 1-23
29. Vargas-Silva, C. (2009) The Tale of Three Amigos: Remittances, Exchange Rates, and Money Demand in Mexico *Review of Development Economics*, 13(1), 1–14
30. Yang, D. (2008) ‘International Migration, Remittances and Household Investment: Evidence from Philippine Migrants’ Exchange Rate Shocks’, *The Economic Journal*, 118 (April), 591–630.
31. Wahba, J. (1998) The transmission of Dutch disease and labor migration. *The Journal of International Trade & Economic Development* 7:3 355-365
32. World Bank (2006) *Global Economic Prospects; Economic Implications of Remittances and Migration*. Washington D.C. World Bank.
33. World Bank (2009) *Global Development Finance*. Washington D.C. World Bank.
34. World Economic Forum (2008) *Global Competitiveness Report*, WEF, Geneva.

TABLE 1
Relative Size of OF Remittances: Level, Annual Growth Rate and as Ratio of Selected Economic Indicators ^{1/}

Period	Level (US\$B) ¹	Growth Rate (%)	As % of GDP ²	OF Remittances as % of -			
				XGS	FDI	GIR	DSB
1996	4.3	11.3	5.2*	10.9	118.9	36.6	85.7
1997	5.7	33.3	7.0*	11.9	681.1	65.3	102.6
1998	7.4	28.3	10.2	17.0	365.5	68.0	144.6
1999	6.0	-18.3	7.3	16.0	482.8	40.0	91.5
2000	6.1	0.5	7.5	14.9	270.1	40.2	96.5
2001	6.0	-0.3	7.9	17.5	3,092.8	38.4	92.3
2002	6.9	14.2	8.5	18.2	446.6	42.1	88.7
2003	7.6	10.0	9.0	19.6	1,543.4	44.4	95.3
2004	8.6	12.8	9.4	20.0	1,242.7	52.7	118.4
2005	10.7	25.0	10.4	23.9	576.5	57.8	140.1
2006	12.8	19.4	10.4	24.1	436.9	55.6	157.6
2007	14.5	13.2	9.7	24.4	495.5	42.8	188.0
2008	16.4	13.7	9.5	28.3	1,063.9	43.7	222.9
2009	17.4	5.6	10.3	35.7	883.7	39.2	249.6
2010	18.8	8.2	9.4	28.8	1,095.3	30.1	257.5
2011	18.3	7.3	9.1	30.9	2,268.0	24.0	270.5
(Jan-Nov)			(Jan-Sept)	(Jan-Oct)	(Jan-Oct)		(Jan-Oct)

¹ Refers to cash remittances coursed through the banking system

² Data were based on the revised GDP data published by the NSCB

* Data were based on the old GDP series

GDP = Gross Domestic Product

XGS = Exports of Goods and Services

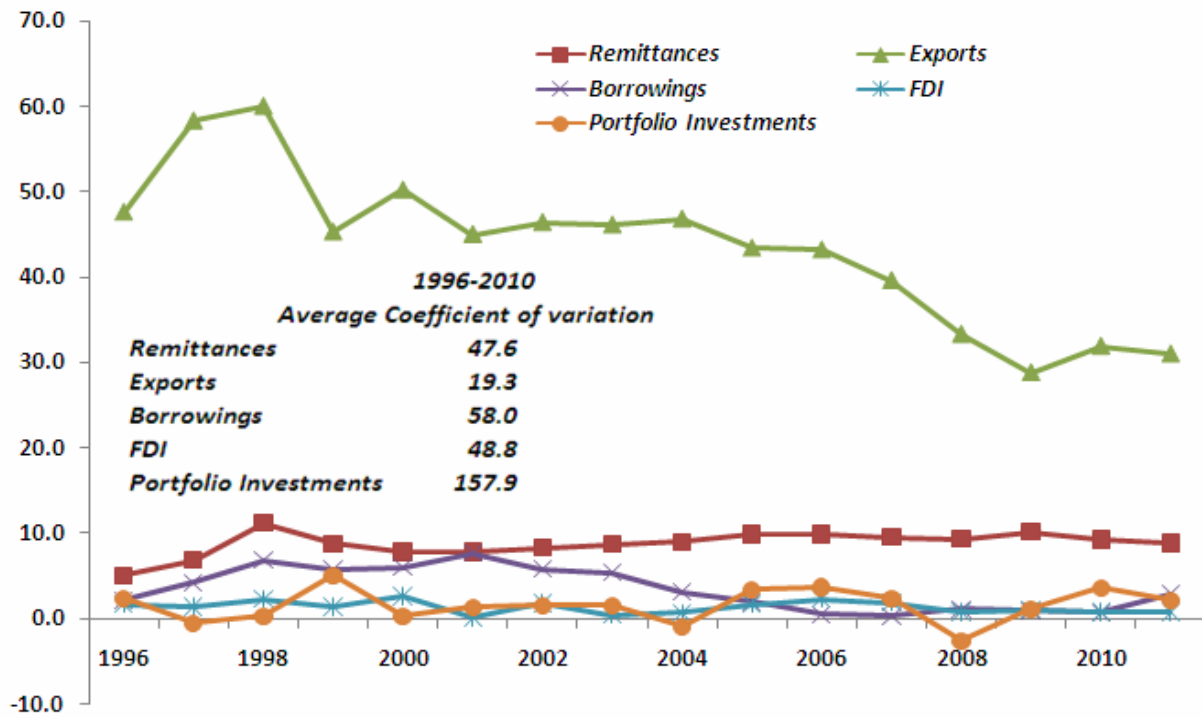
FDI = Foreign Direct Investment

GIR = Gross International Reserves

DSB = Debt Service Burden

Source of data: Department of Economic Statistics

FIGURE 1
Relative Magnitude and Volatility of Selected Foreign Exchange Inflows, 1996-December 2010



Source of basic data: Department of Economic Statistics, BSP.

FIGURE 2
OFW Deployment (1999-2010)
Year-on-Year Cumulative Growth (%)

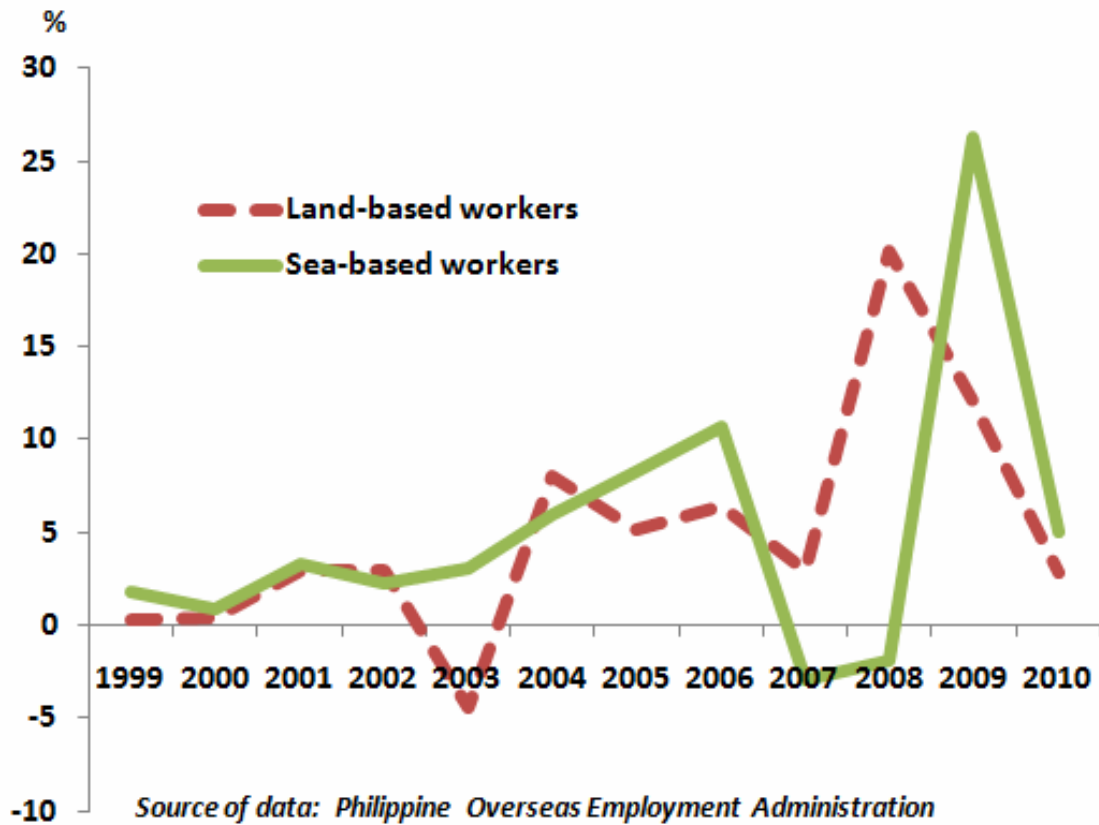


FIGURE 3
Tracing the Impact of Changes in Remittances on Economic Growth and Prices

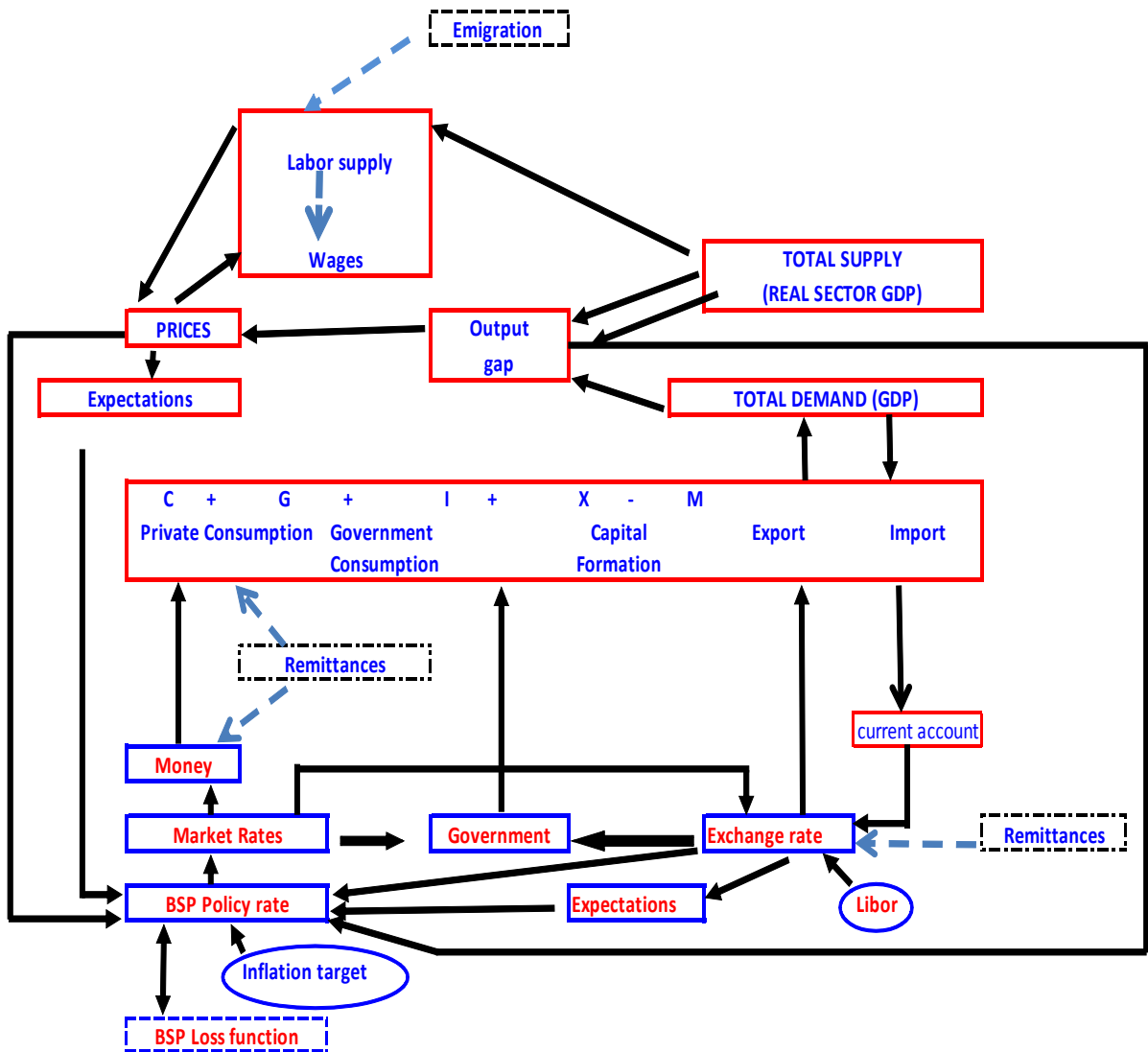


TABLE 2
Regression Estimates: Selected Behavioral Equations Relevant to Remittances

VARIABLES	Lag (Quarter)	Monetary Sector					Real Sector				
		RRP BSP policy rate (EQ 1)	TBR91 91-day Tbill rate (EQ 2)	LR Bank lending rate (EQ 3)	FXR Nomina peso- dollar rate (EQ 4)	REMIT Remittances (EQ 5)	DEPLIAB Bank Deposits (EQ 6)	DISY Disposable Income (EQ 7)	PCE Personal Consumption (EQ 8)	GDCF Investments (EQ 9)	LF Labor Force (EQ 10)
Constant		5.68	-1.01	4.07	1.20	10.66	5.13	2.08	3.04	1.73	-1.31
Log(GDP)	1					0.20 */	0.22 */			0.79 */	
INDTAX								-0.69 */			
CA/GDP	2				-0.12 */						
Potgap	1	0.16 */									
Log(DISY)									0.78 */		
Log(DISY)	1							0.49 */			
Log(PCE)/FXR	1					0.64 */					
RRP			0.81 */								
RRP	2	0.21 */									
TBR91	1		0.41 */	0.40 */	0.71 */				*/		
TBR91-XINFL	1					**/			-0.75		
TBR91-Libor90	1					0.13					
Log(DEPLIAB)	1						0.29 */		0.06 */	*/	
LR-XINFL										-0.22	
Libor90			0.78 */								
Libor90-TBR91					-0.20 */						
Log(LF)	2										0.38 */
FXR	1		0.20 */							0.15 */	
LR	1			0.34 */							
Log(REMIT)								0.12 */			-0.29 */
Log(REMIT)	1					0.22 */	0.11 */		0.13 */	0.22 */	
XINFL			0.74 */								
FINFL-INFTAR		0.30 */									
Log(USGDPHP)						0.17 */					
Workage											0.84 */
Log(DEPLOY)											-0.12 */
Log(QSE1P/PGDP)	1										0.14 */
AR(1)		0.87 */		0.43 */	0.25 **/	-0.02	-0.05	0.34 **/	-0.34 **/	-0.58 */	
Diagnostic Tests:											
Adjusted R ²		0.84	0.97	0.92	0.91	0.85	0.79	0.92	0.88	0.89	0.62
Durbin Watson		2.01	2.05	1.98	2.01	1.96	1.89	2.05	1.99	2.00	2.01
Prob (Jarque-Bera)		0.21	0.22	0.18	0.51	0.12	0.11	0.41	0.18	0.22	0.12
White Heteroscedasticity					0.16		0.22	0.12		0.45	0.75
Breusch-Godfrey					0.98		0.38	0.24		0.31	0.03
Prob (Ramsey RESET Test)					0.30		0.12	0.34		0.22	0.12
J-statistic (Adjusted)		0.08	0.05	0.03		0.01			0.04		

*/ Significant at 5% level of significance

**/ Significant at 10% level of significance

Source: Author's estimates.

VARIABLES	VARIABLE DEFINITION
Constant	
Log(GDP)	Real Gross Domestic Product
INDTAX	Individual Income Tax
CA/GDP	Current Account/Nominal GDP
Potgap	Output gap
Log(DISY)	Disposable income
Log(DISY)	
Log(PCE)/FXR	Personal or household consumption expenditure/nominal peso-dollar rate
RRP	Overnight BSP policy rate
RRP	
TBR91	91-day Treasury bill rate
TBR91-XINFL	91-day Treasury bill rate-expected inflation rate (model consistent)
TBR91-Libor90	91-day Treasury bill rate-90-day LIBOR
Log(DEPLIAB)	Domestic deposit liabilities
LR-XINFL	Average bank lending rate-expected inflation rate (model consistent)
Libor90	90-day LIBOR
Libor90-TBR91	90-day LIBOR-91-day Treasury bill rate
Log(LF)	Labor force
FXR	Nominal peso-dollar rate
LR	Average bank lending rate
Log(REMIT)	Overseas remittances (converted into peso)
Log(REMIT)	
XINFL	Expected inflation rate (model consistent)
FINFL-INFTAR	One-quarter ahead inflation forecast
Log(USGDPHP)	US Real Gross Domestic Product (HP-filtered)
Workage	Working age population
Log(DEPLOY)	Deployment level
Log(QSE1P/PGDP)	Compensation for non-agriculture workers (re-based to 1985)
AR(1)	Autoregressive term

TABLE 3
Impact Scenario: A Sustained 1 Billion US\$ Increase in OF Remittances

Economic indicators	Change from Baseline	
	2004-2008 ^{a/}	
	Average	CV
<u>GDP components (%)</u>		
Personal consumption (growth)	4.12	2.50
of which: Disposable income (growth)	0.84	1.90
Gross capital formation (growth)	0.55	0.76
Total exports (growth)		
Merchandise exports of goods (growth)	-1.45	-0.83
Non-merchandise exports of goods (growth)	-1.01	-0.62
<u>Labor sector indicators (%)</u>		
Labor force (growth)	-0.35	-0.24
Non-agriculture compensation index (growth)	1.71	0.63
Unemployment (growth)	-0.78	-0.12
<u>Financial indicators (%)</u>		
Money supply (year-on-year growth)	2.12	1.01
RRP (%)	0.50	0.21
91-day treasury bill rate (%)	0.20	0.13
Bank lending rate (average, %)	0.25	0.12
Nominal peso-dollar rate (growth)	-1.52	-1.10
<u>Macroeconomic indicators (%)</u>		
Real GDP (growth)	1.09	0.98
Output gap (growth)	-0.45	-3.09
CPI-inflation	0.30	0.39
CPI-inflation forecast (two years ahead)	0.12	0.16
CPI-inflation expectations (long run)	0.07	0.09

Source: Author's results.

^{a/} Preliminary.

TABLE 4
Selected Asian Countries: Year-on-Year Growth Rate of Merchandize Exports, 1999-2010

Year	Philippines	Malaysia	Indonesia	Thailand	Singapore	India	South	
							Korea	Vietnam
1999	-	17.0	1.7	7.6	4.4	8.2	9.9	23.3
2000	9.1	17.0	27.6	19.6	20.4	17.3	21.2	25.2
2001	-16.2	-10.6	-12.3	-7.1	-10.7	3.6	-14.0	4.0
2002	9.9	6.1	3.1	4.7	3.0	14.2	7.9	11.2
2003	2.7	12.4	8.4	18.2	14.8	19.1	20.7	20.6
2004	9.8	20.8	10.4	21.6	23.4	28.0	30.6	31.5
2005	3.8	11.8	22.9	15.2	16.8	31.1	12.1	22.5
2006	15.6	13.5	19.0	17.0	18.2	21.1	14.8	22.7
2007	6.4	9.5	14.0	18.2	10.2	24.3	14.2	21.9
2008	-2.5	13.3	18.3	15.9	13.2	29.1	14.2	29.1
2009	-22.1	-21.1	-14.4	-14.0	-20.2	-15.3	-13.7	-8.9
2010 Q2	34.3	33.1	34.4	42.0	34.9	28.7	34.2	32.9
Average								
1999-2009	1.6	8.2	9.0	10.6	8.5	16.4	10.7	18.5

Source of data: BSP Philippine Economic Indicators