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# MONEY AND PRICES IN THE PHILIPPINES, 1981-1992: A COINTEGRATION ANALYSIS

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## INTRODUCTION

The design of rules and formulation of discretionary action governing monetary policy is one issue that concerns economic managers. In the Philippines, the monetary authorities do not reveal the actual policies they pursue and this makes it difficult to evaluate their actions. Hypotheses regarding the optimality of policy cannot be tested unless the policy is adequately described.

A matter of great interest is the relationship between the price level and a monetary aggregate since the former is one possible variable on which to anchor the money policy. Apart from the issue of which monetary aggregate is the appropriate link, the direction of causality must be investigated. This will determine whether the Central Bank, by controlling the money supply, has indeed influenced the price level. Such a situation can be supported by empirical evidence that indicates a causality running from money to prices. A reverse causality, on the other hand, means that the Central Bank has been accommodating price increases.

This study is largely based on the work of Funke and Hall (1992) which, in turn, arises from two developments in the econometric literature: the first is the P* framework stemming from the work of Hallman et al. (1989, 1991) and used in a major international study

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by Hoeller and Poret (1991) and the second is the development of a set of new techniques in multivariate cointegration analysis due to Johansen (1988, 1991). By investigating the relationship between money and price level, Funke and Hall sought to determine whether there is a fundamental difference in the conduct of monetary policy between Germany and other countries, specifically the US and the UK. This analysis has important repercussions on the drive towards a European Monetary Union.

The present study has limitations similar to a recent one by Gochoco (1992), which seeks to determine whether monetary authorities in the Philippines effectively pursued an exchange rate peg or not by comparing the volatilities of money aggregates and the exchange rate. Her study does not address the issue of whether such a policy is optimal or not. Similarly, while this study describes the relationship between money and prices, it does not attempt to evaluate whether the actions of the Central Bank that led to this outcome have been optimal. The design of optimal monetary policy whether it be in the form of rules or discretion could be analyzed in future studies using a framework such as that of Frankel (1993).

Section II presents the general statistical and theoretical framework on which we base our discussion. Section III then examines the empirical evidence with emphasis on the direction of causality within the system. The last section highlights institutional features of the Philippine economy, especially with regard to monetary policy, that may have given rise to the results presented in the previous section.

## THE ECONOMIC AND STATISTICAL FRAMEWORK

Our analysis of the relationship between money and price level begins with a brief exposition of the P* approach, which is based on the simple quantity equation:

$$QP = MV \qquad (1)$$

where Q is the real GNP, P is the GNP price deflator, M is the stock of money and V is the velocity of money. From this equation, Hallman et al. (1989, 1991) have recently developed an indicator of the long-term relationship between the money stock M and price level P, which has become known as the P* (P-star) concept. This long-run equilibrium price level, P*, is defined as the price level consistent with the current value of M, the long-run equilibrium value of velocity (V*), and the current value of potential real GNP (Q*):

$$P^* = \frac{MV}{Q} \qquad (2)$$

The long-run price level P* can then be compared with the actual price level P. Any divergence of the price level P* from the actual price level P, i.e. any positive or negative price gaps P* - P, then suggests that the future price level will accelerate or slow down. An application of this framework is to identify the equilibrium price level through the construction of P* and then to estimate reduced-form short-run dynamics that drive the actual price level to P* and thereby are consistent with the long-run constraints imposed by P*. Such a short-run dynamic model of inflation is given by the following error-correction model:

$$\Delta \text{Ln}(P_t) = \sum_{I=1}^{N} \alpha_I \Delta \text{Ln}(P)_{t-1} + \beta (P_{t-1}^* - P_{t-1}) \qquad (3)$$

The basic idea behind equations (2) and (3) therefore is that any increase in the stock of money which is not accompanied by an increase in real output, will cause an increase in P in the long-run. In order to test this basic hypothesis for the Philippines, the P* approach will be reformulated in terms of a multivariate cointegration analysis following Funke and Hall. The first statement which can be made about the approach is that for equation (3) to be a valid representation of the data, P and P* must form a cointegrating relationship in the sense of Engle and Granger (1987).

When following the definition of the P* variable, we can now see that this implies a very strong statement about the underlying variables in the system. The logged analogue to equation (1) is:

$$V = P + Q - M \quad (4)$$

Then we can define the equilibrium velocity V* by producing a model of V,

$$V = \gamma_o + \gamma'Z + e_t \quad (5)$$

where Z is a suitable set of variables that drive V, $\gamma$ is a vector of parameters and $e_t$ is an i.i.d. (identically and independently-distributed) error term. Then we can define V* as

$$V^* = \gamma_o + \gamma'Z \quad (6)$$

i.e. V* is the forecast from equation (5). Then P* is defined as

$$P^* = V^* + M - Q^* \quad (7)$$

Now we know from cointegration theory that for equation (3) to be a valid model, the difference between P and P* must be stationary, i.e.

$$P - P^* = W_t \quad (8)$$

where $w_t$ must be stationary. Now by substituting (7) into (8) and using (4) and (5), it is easy to show that

$$w_t = e_t \qquad (9)$$

In other words, for $w_t$ to be stationary, $e_t$ must likewise be stationary and this implies that Z and V or Z, P, Q*, and M form a cointegrating set of variables. This implication allows the questions of causality to be addressed in a formal and satisfactory way using recent work on multivariate systems of cointegrated variables. The basic statistical concepts are briefly introduced below. As a tentative data generating process, consider the following four-dimensional k-th order vector autoregressive (VAR) model with Gaussian errors

$$X_t = r_0 + r_1 X_{t-1} + \ldots + r_k X_{t-k} + e_t \qquad t=1,\ldots,T \qquad (10)$$

where $X_t$ = [M, Q*, P, V*], $r_i$ are 4×4 coefficient matrices, and $e_t$ is a 4×1 vector of independent and identically (normally) distributed error terms. In empirical applications, the lag length k will be specified enough for the residuals to be uncorrelated.[1] In this form, the model is based on minimal behavioral assumptions on the economic phenomenon of interest.[2] Given that the model can be accepted, we have a well defined statistical model for the data generating process within which economically interesting questions on the long run behavior can be asked and tested in a well-defined statistical framework. This then allows for a maximum likelihood analysis if Gaussian errors are assumed. Because no assumption is made at this stage on the specific form of the simultaneous structure of the model, the approach also eliminates the single

1. In order to check whether the model (10) is an appropriate description of the data generating process, the assumption of Gaussian error terms is tested in the following empirical work.

2. Note that there are no exogenous or endogenous variables and so we do not make *a priori* assumptions about the exogeneity of some of the variables in the system.

equation bias likely to have affected previous studies. The VAR model in levels can be reparameterized in error correction form as

$$\Delta X_t = r_0 + \pi_1 \Delta X_{t-1} + \pi_2 \Delta X_{t-2} + \ldots + \pi_{k-1} \Delta X_{t-k+1} + \pi_k \text{-} X_{t-k} + e_t \qquad (11)$$

where $\pi_i = -I + r_1 + \ldots + r_i$, $i = 1,\ldots,k$ and I is the identity matrix. $\pi_k$ defines the long-run solution. Now, the heart of the Johansen procedure is simply to decompose the matrix $\pi_k$ into two matrices $\alpha$ and $\beta$, both of which are $4 \times r$ in dimension such that

$$\pi_k = \alpha\beta' \qquad (12)$$

The rows of $\beta$ can be interpreted as the cointegrating relations among the four nonstationary variables and the rows of $\alpha$ show how these cointegrating vectors are loaded into each equation in the system. The loading matrix therefore effectively determines the causality in the system, i.e. it allows us to test the direction in which causality flows. Johansen (1988, 1991) gives a maximum likelihood estimation technique for both matrices, and outlines suitable tests on the number of distinct cointegrating vectors which exist as well as on the hypothesis about the matrices. By testing $\beta$, parameter restrictions on the long-run properties of the data may be tested. On the other hand, by testing $\alpha$, the direction of causality within the model may be tested.

## EMPIRICAL RESULTS

In their analysis of German data, Funke and Hall ignore the use of potential GNP, Q*, and focus solely on the more important role played by V* because only long-run relationships are considered. Consistent long-run data on P, M, and Q is not available in the Philippines and this constrains us to use quarterly data from 1981-

1992 in order to arrive at an adequate time series. This hardly qualifies as a long-term period and thus an estimate of Q* is required for our study.

An initial step is to examine the behavior of velocity over time in order to derive a suitable measure of V* (Figures 1, 1a and 2, 2a). From both the annual data covering the period 1967-1992 and the quarterly data, it is evident that the velocities of the two monetary aggregates considered for our study have fluctuated considerably. However, the velocity of the broad monetary aggregate, V2, does not indicate a trend especially when compared to V1, a measure based on M1. This distinction is more apparent in the case of annual data.

The reason for the difference in V1 and V2 lies mainly in the behavior of demand for M1 and TL. There has been only a relatively marginal increase in M1 since 1967, owing perhaps to the creation of new financial instruments and the trend towards automation. The demand for TL experienced faster growth following the rise in income (currency is an inferior good) and the implementation of financial liberalization measures. The absence of a trend provides a relatively reliable long-run link between the broad money aggregate (labelled TL, for total liquidity) and the price level (Hallman et al., 1989:841). A statistically more robust basis for the choice of TL is presented later.[3]

Equation 5 is estimated using OLS.[4] A measure of financial wealth as a ratio of nominal potential GNP, capital stock as a ratio of

3. M1 consists of currency and demand deposits while TL includes M1 plus savings and time deposits and deposit substitutes. The latter is defined as markets for additional funds by financial intermediaries and includes instruments such as dealer promissory notes, repurchase agreements, and certificates of assignment. In 1986, the coverage of TL was expanded to include national government deposits with the Central Bank and the transfer of the assets of two government financial institutions to the national government.

4. The estimation procedures were carried out using the REG-X software package (version 92.6) developed by Professor Stephen Hall of the London Business School.

**Figure 1**
**QUARTERLY M1 VELOCITY, 1981-1982**

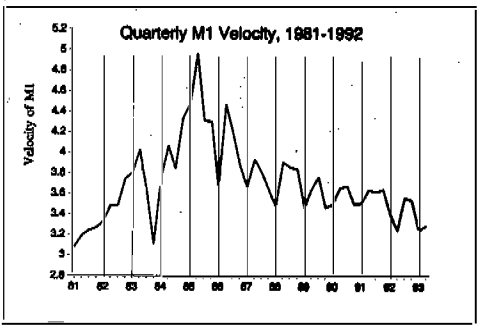



**Figure 1A**
**QUARTERLY TL VELOCITY, 1981-1992**

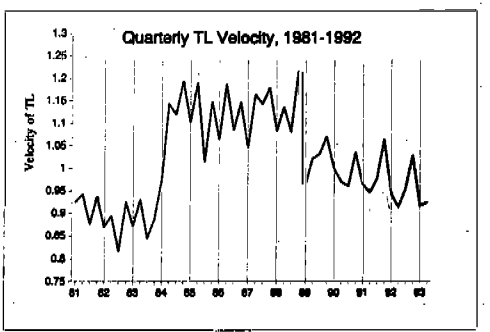


**Figure 2**
**ANNUAL M1 VELOCITY, 1967-1922**

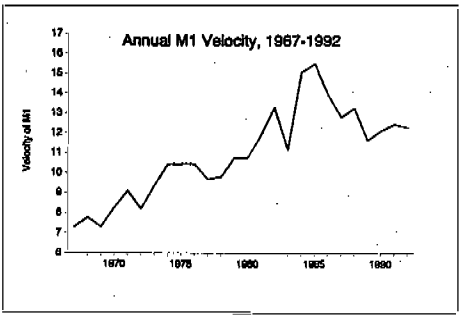
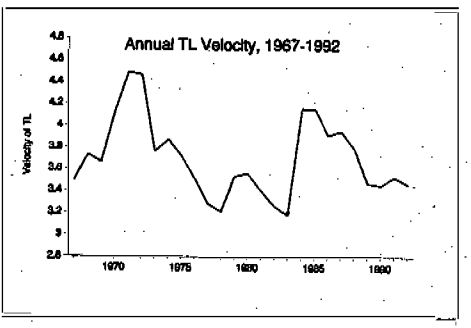



**Figure 2A**
**ANNUAL TL VELOCITY, 1967-1922**




Source of basic data: National Income Accounts
and Central Bank of the Philippines

nominal potential GNP, and real GNP growth rate are used as determinants for the velocity of TL. A measure of potential GNP (Q*) is obtained by first regressing actual GNP against a time variable. Potential GNP then becomes the estimated GNP from this equation. The estimate of V* is the predicted value from Equation 5. The regression results are shown in Table 1.

**Table 1**
**ESTIMATES OF THE V* MODEL**

$$(P+Q^*-M)_t = 1.38092 - \underset{(10.22)}{0.726088}*LW2_t - \underset{(4.03)}{0.261573}*LCS2_t - \underset{(2.90)}{0.54467}*GNPR_t \quad (4.17)$$

Sample period: 1982:1 - 1991:4

| | | | |
|---|---|---|---|
| R square | = 0.90 | DW | = 1.45 |
| DF | = -4.64 | ADF(4) | = -2.16 |
| Skewness | = 0.96 | Kurtosis | = 4.12 |
| Bera-Jarque | = 8.29 | | |

where

| | | |
|---|---|---|
| PGNP | = | implicit price deflator for GNP |
| LTL | = | log (total liquidity) |
| LPGNP | = | log (PGNP) |
| LPOT | = | log (potential GNP) |
| P+Q*-M | = | LPGNP + LPOT - LTL |
| GNPR | = | GNP growth rate |
| LCS2 | = | log (capital stock/(PGNP*POTGNP) |
| LW2 | = | log (net domestic assets/(PGNP*POTGNP). |

All the explanatory variables are significant. (Alternative specifications for P+Q*-M included either the nominal or the real interest rate but the interest rates were found to be statistically insignificant). The diagnostic test statistics used to test for normality are skewness (centered on zero), kurtosis (centered on 3), and the Bera-Jarque statistic which is distributed $x^2(2)$. The Bera-Jarque statistic together with the measures of skewness and kurtosis do not indicate non-normality. The exact critical values for the Dickey-Fuller and augmented Dickey-Fuller tests for models with more than three variables are unknown, although Granger and Engle have derived the critical values for models with 2 and 3 variables. The results suggest that the variables do cointegrate.

To test for the number of cointegrating vectors, we apply Johansen's maximum likelihood estimation and testing procedure to the set of logged variables P, Q*, M, and V*. The results are shown in Tables 2 and 3.

**Table 2**
**THE ESTIMATED UNRESTRICTED EIGENVECTORS**

| Importance | P | Q* | M | V* |
|---|---|---|---|---|
| 1 | 1.0 | 1.5 | -1.0 | -0.98 |
| 2 | 1.0 | 1561 | -251.22 | -4218.3 |
| 3 | 1.0 | -39.88 | 3.13 | -1.04 |
| 4 | 1.0 | -17.95 | 0.755 | -0.286 |

**Table 3**
**TEST OF NUMBER OF DISTINCT COINTEGRATING VECTORS**

| Number of vectors | Asymptotic LR test | Small sample LR test | 95% Critical value |
|---|---|---|---|
| 1 | 50.42 | 30.25 | 47.21 |
| 2 | 23.00 | 13.80 | 29.68 |
| 3 | 8.64 | 5.18 | 15.41 |
| 4 | 0.45 | 0.27 | 3.76 |

The likelihood ratio (LR) statistics in Table 3 tests for the number of cointegrating vectors. The null hypothesis that the vector(s) is not a cointegrating vector(s) is rejected if the LR test statistic exceeds the 95 percent quantiles of the limiting distribution. The results indicate that, using the standard LR test, the hypothesis of one cointegrating vector is accepted. However, the LR test adjusted for small sample is not passed.

The parameter estimates of P and Q* are positive while the estimates of M and V* are negative in the first cointegration vector. The absolute values of the parameter estimates are close to unity. These tend to confirm the velocity relationship.

Table 4 shows how the variables get loaded into the dynamic system. The Wald tests show that the loading weights are not statistically significant for P, Q*, and M. This implies that the cointegrating vector, or the P*-vector, is not significant in driving P, Q*, and M. In the case of V*, the cointegrating vector is significant.

**Table 4**
**LOADING WEIGHTS FOR THE UNRESTRICTED MODEL**
**Loading Weights Under the Assumption of One Distinct Cointegrating Vector**

| | P | Q* | M | V* |
|---|---|---|---|---|
| $á_{1i}$ | 0.2040D-002 | -0.6101D-007 | -0.8024D-002 | 0.1652D-002 |
| W(1) | 0.2356 | -0.0000-647 | 1.267 | 7.820 |

The results suggest that there is no causality between money and prices during the period covered in the study. This is in contrast to the results obtained in different studies for developed countries. In the case of the UK and USA, the results obtained suggest that the causality runs from prices to money. For Germany, the causality is bidirectional.

Granger and Sim's tests are employed to determine causality in the Granger sense. The variables TL and PGNP are transformed

using an autoregressive model of order 2 to correct for autocorrelation. Table 5 shows the results of regressing PGNP against past, present, and future values of TL. The low t-statistics associated with coefficients of future TL indicate that prices do not cause money. Similarly, the low t-statistics of the coefficients of past values of TL suggest that money does not cause prices.

**Table 5**
**RESULTS OF REGRESSION OF PGNP ON TL**

| Variable | Coefficient | T-statistic | Significance |
|---|---|---|---|
| TL | -0.00013 | -0.42 | 0.678 |
| TL(-1) | 0.00025 | 0.82 | 0.421 |
| TL(-2) | 0.00027 | 0.98 | 0.335 |
| TL(-3) | 0.00031 | 1.07 | 0.295 |
| TL(-4) | 0.00012 | 0.41 | 0.683 |
| TL(1) | 0.00018 | -0.58 | 0.569 |
| TL(2) | -0.00014 | -0.51 | 0.611 |
| TL(3) | -4.470D-05 | -0.18 | 0.856 |
| TL(4) | 0.00013 | 0.51 | 0.612 |

Table 6 shows the regression of TL on past, present, and future values of PGNP. Some of the coefficients are significant. However, the joint test of the significance of past values of PGNP indicates no causality running from PGNP to TL (refer to Table 7). Similarly, the joint test of the significance of the future values of PGNP suggests no causality running from TL to PGNP. Thus, there is no causality between money and prices.

## THE PHILIPPINE ECONOMY FROM 1981-1992

Following Hoover (1991), the interpretation of the empirical results must go beyond the statistical aspects and also consider the institutional features of the economy. In this way, one can explain

**Table 6**
**RESULTS OF REGRESSION OF TL ON PGNP**

| Variable | Coefficient | T-statistic | Significance |
|---|---|---|---|
| PGNP | -1564.79 | -1.68 | 0.104 |
| PGNP(-1) | 1557.02 | 1.65 | 0.112 |
| PGNP(-2) | 120.18 | 0.13 | 0.901 |
| PGNP(-3) | 180.13 | 0.22 | 0.827 |
| PGNP(-4) | -567.25 | -0.82 | 0.419 |
| PGNP(1) | 270.94 | 0.29 | 0.774 |
| PGNP(2) | -1574.54 | -1.68 | 0.105 |
| PGNP(3) | 1384.88 | 1.73 | 0.095 |
| PGNP(4) | 2416.86 | 3.55 | 0.001 |

**Table 7**
**RESULTS OF THE GRANGER AND SIM'S TEST**

| Equation | F | SSE | Partial F | Adjusted $R^2$ | DW |
|---|---|---|---|---|---|
| TL=f(PGNP,4 past, 4 future) | 20.97 | 3324.716 | | 0.97 | 1.63 |
| TL=f(PGNP, 4 future) | 102.62 | 3819.661 | 0.48 | 0.89 | 0.47 |
| TL=f(PGNP, 4 past) | 42.19 | 5232.301 | 1.38 | 0.91 | 0.91 |
| TL=f(4 past, 4 future) | 24.33 | 3348.149 | 0.18 | 0.96 | 1.73 |

the result that money and prices did not exhibit a significant relationship during the period under the study.

Table 8 summarizes various key events that characterized the Philippine situation during the past twelve years, highlighted by the end of the Marcos regime in early 1986. This series of crises and natural calamities has taken its toll on the economy, which has not experienced a period of sustained output growth. Because of the rather delicate state of affairs, monetary authorities were always on the defensive, reacting to the shocks that buffeted the economy, rather than taking an active role in promoting a stable macroeconomic environment. In what follows, we briefly describe the different shocks during the period 1981 to 1992 and the policy responses and institutional features that may have led to a divergence in the behavior of money and prices.

The first major crisis in this period was in the financial sector when a wealthy businessman fled the country in 1981, leaving millions of dollars in debt with various Philippine financial institutions. This particular incident was rather ill-timed as it occurred just as financial reforms, which were an offshoot of a joint IMF-WB study, were being implemented. The latter included the reduction of specialization among banks, the introduction of the concept of "Universal Banking," and the liberalization of interest rates. The crisis shook the financial system and brought about massive withdrawals by money market investors and bank depositors. The Central Bank and two major government financial institutions had to rescue many troubled financial establishments in order to restore the public's confidence in the financial system.

In the following year, the international financial crisis took place, exposing the weakness of many countries which had borrowed heavily in the international capital markets. The Philippines was not spared the heavy costs of adjustment, especially since the bulk of its external debt was owed by the public sector or government-guaranteed. The economic crisis was exacerbated by political uncertainties that followed the assassination of a prominent

**Table 8**
**MAJOR ECONOMIC SHOCKS AND POLICY RESPONSES IN THE PHILIPPINES**

| Period | 1980-1982 | 1983-1985 | 1986-1990 | 1991-1992 |
|---|---|---|---|---|
| External shock | Oil price shock | Stoppage of foreign capital inflow | Negotiated debt rescheduling | Gulf war |
| | Recession | Capital flight | Resumed multilateral and bilateral loan inflows | |
| | High world interest rates | | Net resource outflow due to debt payment | |
| | Restricted foreign credit | | | |
| Domestic shock | Dewey Dee financial crisis | Assassination of Aquino | Takeover of Aquino government | Volcanic eruption, energy crisis, Presidential elections |
| | | | Coup attempt, earthquake | |

**Table 8 continued**

| Period | 1980-1982 | 1983-1985 | 1986-1990 | 1991-1992 |
|---|---|---|---|---|
| Monetary policy | Highly expansionary counter-cyclical financial liberalization | Restrictive deflationary, high interest rates | Expansionary in initial years; tight with high interest rates in later years | Tight, lower real interest rates due to inflation surprise, but recovery in 1992 |
| Fiscal policy | Counter-cyclical | Contractionary, concentrated on debt service and bailout of government corporations | Initially expansionary, in later years concentration on domestic borrowings and tax reforms | Tight, cutback on operation and expenditures and capital outlays |
| Trade and industry policy | Beginning of removal of QR's | Suspension of trade liberalization, taxation of tradeables, rationing of foreign exchange, devaluation | Trade liberalization slowly depreciating peso in 1990 | Continued liberalization, focus on AFTA, sharply appreciating peso, emphasis on energy projects |

**Table 8 continued**

| Period | 1980-1982 | 1983-1985 | 1986-1990 | 1991-1992 |
|---|---|---|---|---|
| Combined effects | Slow growth, inflation | Deep economic recession, high inflation | Economic recovery up to 1989, increasing current account deficits, slow growth in 1990 | Recession, surge of inflation in 1991, inflow of "footloose foreign capital |
| Private response | Unfavorable reduced savings, capital flight but continued investments spurred by government pump-priming | Collapse of business confidence | Renewed confidence initially, erratic behavior in later years | Renewed confidence due to peaceful transition of power, sharp decline due to energy crisis |

Note: Summary of key events is based on Table 3.1 of M. Lamberte, J. Lim, R. Vos, J. Yap, E. Tan and S. Zingapan, *Philippine External Finance, Domestic Mobilization and Development in the 1970s and 1980s*. Makati: Philippine Institute for Development Studies, 1990.

opposition figure in 1983. During the next two years (1984-1985) output fell by a combined 15 percent with inflation averaging 35 percent (Table 9). The monetary authorities contributed to the recession by pursuing restrictive policies driving interest rates upward and stifling domestic credit. The purpose of the tight monetary policy was to stem the outflow of capital and to ease the pressure on the exchange rate.

**Table 9**
**KEY MACROECONOMIC INDICATORS: PHILIPPINES, 1981 - 1992**

| | Real Output growth (GNP, percent) | Inflation (PGNP, percent) | Interest rate (91-day T-bill) | Monetary growth (TL, percent) |
|---|---|---|---|---|
| 1981 | 3.2 | 11.7 | 12.6 | 20.9 |
| 1982 | 2.8 | 8.7 | 13.8 | 16.4 |
| 1983 | 1.4 | 14.2 | 14.2 | 18.9 |
| 1984 | -8.7 | 53.3 | 30.5 | 7.2 |
| 1985 | -7.1 | 17.7 | 26.8 | 9.6 |
| 1986 | 4.1 | 2.9 | 14.4 | 13.7 |
| 1987 | 5.1 | 7.4 | 11.4 | 11.3 |
| 1988 | 7.1 | 10.2 | 14.7 | 23.1 |
| 1989 | 5.7 | 8.7 | 18.6 | 25.8 |
| 1990 | 4.5 | 12.7 | 23.7 | 18.7 |
| 1991 | 0.2 | 17.0 | 21.4 | 14.3 |
| 1992 | 0.6 | 7.9 | 16.0 | 11.5 |

Source of basic data: National Income Accounts and Central Bank of the Philippines.

Economic management during the period 1986 to 1992 was largely dominated by the management of the external debt overhang. Net resource outflows totalled $7.7 billion from 1986 to 1991 as the country's financial managers adhered to a conservative strategy to resolve the debt crisis. Because of its accumulated losses (which reached approximately $12 billion in 1992), the Central Bank could not contribute effectively to macroeconomic stability. Part of the losses were monetized, leaving very little leeway

for the Central Bank to provide credit to the domestic financial institutions. In fact, it conducted quasi-fiscal functions in order to prevent rapid growth of the money supply. The Treasury had, on many occasions, overborrowed in the domestic capital market and deposited the excess with the Central Bank.

The overdependence on domestic borrowing spawned a regime of high real interest rates, leading to a slow down in private investments and an overvalued currency. Gochoco (1992) has argued that the defense of the exchange rate has been the overriding objective of monetary policy. While the inflationary consequences of a devaluation is a factor, the major consideration for a stable exchange rate is the performance of the industrial sector which remains relatively inward-oriented. Another primary reason for the overvalued currency is the internal transfer problem wherein the government owes the bulk of external debt (about 80 percent) but has to source the foreign exchange from the private sector. A strong peso, of course, mitigated the costs of repaying the external debt.

The previous discussion emphasized the factors that have affected the conduct of monetary policy during the period 1981 to 1992. Inflation hardly played a major role in the decision making process of monetary authorities, which of course is inferred ex-post. From 1983 to 1985, the primary regard was to stem the outflow of "capital flight." During the next six years, monetary policy was captive to the external debt overhang and the corollary internal transfer problem.

While the inflation process was not independent of these crises, it is likely though that the price level followed a different trajectory than that of monetary aggregates. Given that the Philippines is a small open economy, it is not immune to external shocks. Other factors likewise contributed substantially to the determination of prices. In particular, the Philippine economy has been characterized by oligopolistic pricing behavior especially in the industry and service sectors, leading to inflation rates higher than what is

warranted by economic fundamentals. Inflationary expectations, which are affected by the various crises and condition of macroeconomic instability, also exert upward pressure on prices.

## CONCLUDING REMARKS

The empirical results show that on balance there is no causality between money and prices in the Philippines during the period 1981-1992. This relationship can be explained by the highly erratic political and economic environment during the same interval. Another interesting result which was not mentioned earlier is that the P* vector has no significance on potential output. This could be explained by the use of Q* instead of Q in the estimation procedure, with potential output being determined by economic fundamentals outside the P* framework.

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