



Short-run and Long-run Relationship between Money and Prices: The Case of Suriname

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OUTLINE

- Objective & Motivation
- Institutional Changes
- Literature overview
- Data and Methodology
- Model Specification
- Results
- Conclusion & Policy Recommendation



Objective & Motivation

Objective:

- To determine the long run and short run direction of causality between money and prices in Suriname.

Why?

- The general notion exists in Suriname that money drives prices and vice versa. However, empirical investigation not conducted.
- Empirical findings can contribute to existing literature on this topic.

Institutional Changes

- Macroeconomic performance during since 1980s.

Selected macroeconomic indicators (period averages)

Indicator	1980s	1990s	2000s
Real GDP growth (%)	-1.0	0.7	4.5
Average inflation (%)	12.8	96.3	18.8
M1 growth (%)	23.7	65.5	30.7
Fiscal balance (% of GDP)	-17.7	-5.2	-0.6
Import cover ratio (months)	1.7	1.8	2.9

Sources: General Bureau of Statistics, Central Bank of Suriname and
Ministry of Finance

Institutional Changes (cont'd)

- Main institutional changes in the area of monetary and fiscal policy during 1980-2010:
 - Liberalization of exchange rate regime (1992);
 - Reform of the tax system (early 1990s);
 - Open market type monetary operations (1995);
 - Domestic debt restructuring/fiscal rules (2001/2002);
 - Monetary reform (2004).

LITERATURE REVIEW

- Monetarists and Keynesians differ on the direction of causality between money & prices.
- Empirical evidence also inconclusive.

Some empirical evidence of Granger causality between money and prices

Reference	Period	Frequency of data	Country	Results
Alston & Chalfant, 1987	1972-1983	Annual	Australia	Unidirectional causality from money to both wages and prices
Jones, 1989	1959-1980	Quarterly	USA	Bidirectional causality
Baldé & Rodriguez, 2005	1980-1997	Monthly	Peru	Bidirectional causality
Husain & Rashid, 2009	1959-2004	Annual	Pakistan	Unidirectional causality from money to prices in the long run Unidirectional causality from prices to money with two years lag in the short run

Data and Methodology

- The average consumer price index (CPI) and money (M1) are analyzed using annual data over the period 1980 to 2010.
- The stationary properties are determined by using ADF and KPSS test.
- Both tests reveal that the logarithmic values of the series are stationary in their first difference.

Data and.....(cont'd)

- A bivariate VAR model is chosen above a single equation model; Former provides a framework to analyze the temporal ordering of the time series and their response to shocks in the system.
- Impulse response analysis, variance decomposition and Granger causality tests can be applied to receive important information about the interaction among, the proportion of movements in and the exogeneity of the variables respectively.

Data and(cont'd)

- An unrestricted VAR was calculated to determine the optimal lag length to be included in the model.
- The Akaike, Schwarz and Hannan-Quin information criterion indicated two lags.
- The Johansen co-integration rank test (1988), which enables to examine the long run relationships between the log of M1 and CPI, revealed one co-integrating vector.

Data and (cont'd)

- Since the time series are non-stationary in levels but integrated of the order one in their first difference and there exists one co-integrating vector, a dynamic VAR, also called a vector error correction model (VECM), is applied.



Model Specification

• General model:

$$(1) \quad \Delta y_t = \gamma_y (y_{t-1} - a_0 - a_1x_{t-1}) + \sum_{j=1}^r \alpha_j \Delta y_{t-j} + \sum_{j=1}^r \beta \Delta x_{t-j} + u_t$$

$$(2) \quad \Delta x_t = \gamma_x (y_{t-1} - a_0 - a_1x_{t-1}) + \sum_{j=1}^r \delta_j \Delta y_{t-j} + \sum_{j=1}^r \theta \Delta x_{t-j} + v_t$$

- Δy_t and Δx_t are the endogenous time series with u_t and v_t as the respective error terms;
- The long run equilibrium relationship in the system is presented by the error correction term [ECT] $(y_{t-1} - a_0 - a_1x_{t-1})$;
- The parameters of the ECT (γ_y and γ_x) represent the speed of adjustment in case of deviations from the long run equilibrium relationship;
- The lagged values of Δy_t and Δx_t and their parameters represent the short term dynamics in the system.

Results

- Estimated model:

$$(1) \quad \Delta(LM1)_t = -0.242 * (LM1_{t-1} - 0.935 * LCPI_{t-1} - 2.980) - 0.532 * \Delta(LM1_{t-2}) + 0.579 * \Delta(LCPI_{t-1})$$

$$\text{t-stats:} \quad (-5.204) \quad (-3.542) \quad (5.180)$$

$$(2) \quad \Delta(LCPI)_t = -0.191 * (LM1_{t-1} - 0.935 * LCPI_{t-1} - 2.980) - 0.625 * \Delta(LM1_{t-2}) + 0.800 * \Delta(LCPI_{t-1})$$

$$\text{t-stats:} \quad (-2.986) \quad (-3.019) \quad (5.185)$$

- The long run co-integrating equation indicates a unidirectional Granger causality from prices to money in Suriname.
- In the short run, both money and prices may deviate from the long term equilibrium in response to shocks in the system, which implies bidirectional Granger causality.

Results (cont'd)

- Long run outcome contrary to the monetarist view and the empirical evidence.
- Explanation: Occurrence of several episodes of currency depreciations and consequently the wage-price spiral during the sample period, in particular the 1980s and 1990s.
- ECT parameters indicate that in response of a shock in the system money growth and inflation decline in order to correct 24% and 19% respectively of the deviation from long run equilibrium each year.
- A money or price shock would last roughly four and five years respectively before both variables adjust to their long run equilibrium.



Conclusion & Policy Recommendation

- Empirical evidence suggests the existence of a long run Granger causality running from prices to money rather than the conventional path from money to prices.
- In the short run, however, strong evidence of bidirectional Granger causality between money and prices exists.
- The time dimension of the dynamic relationship between money and prices is of interest for policy implementation. Authorities should therefore best adhere to sound policies in order to prevent large swings in money and prices. For small open economies prudence in spending policies is required, especially when foreign currency inflows decline.