Testing long-run neutrality of money: evidence from Malaysian stock market

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ABSTRACT

This paper presents the empirical evidence on the long-run neutrality (LRN) of money in the stock market in Malaysia using seasonal adjusted monthly data from 1978:1 to 1999:12 based on the bivariate ARIMA framework developed by Fisher and Seater (1993). Besides the main stock index, the sectoral stocks indexes also have been tested by different measurements of money supply, namely M1, M2, and M3. Generally, the findings support the LRN of money in Malaysia's stock market and the results are robust to the sensitivity tests of different monetary aggregates. This would imply that the permanent stochastic changes in money supply do not have influential effect towards the real stock returns in Malaysia.

Keywords: Stock markets; Neutrality of money; ARIMA model

JEL Classification: C12, C32, G10, E50

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I. INTRODUCTION

The inability of changes in the stock of money in an economy to affect the real economic activity except the general price level is called long-run neutrality (LRN) of money. Monetary neutrality is an important assumption in monetarism. It is the deriving force behind monetary policy in the new classical macroeconomics. The neutrality proposition has become widely recognized and accepted, however, the notion of neutral money has been a highly debated issue. The LRN hypothesis has not only theoretically but also empirically created a disagreement over the effectiveness of the monetary policy.

According to the monetary-business-cycle models, active and discretionary monetary policy can be used to stabilize the fluctuation in economic activity. As such, the policymaker could through the changes in the growth rate of money supply to influence the market performance. However, this stabilization policy does not apply to the real-business-cycle models since the full employment level of output is only affected by the availability of the factors of production and the level of technology in the market. In other words, the real economic activity would not be affected by monetary policy via the changes in the stock of money. In view of the important role of neutrality concept towards the monetary policy implication, here we would like to test the LRN of money on one of the real economic variable – real stock prices in a small open economy, namely, Malaysia.

The relationship between monetary policy and stock market has been examined extensively since the relative price of capital is among one of the most important transmission channels of monetary policy to the real economy. It is believed that the money supply changes have significant direct effects through portfolio changes, and indirect effects on real economic activity. The finance literature contains numerous empirical studies on the relationship between monetary policy and stock prices. However, the empirical literature has been indecisive. Some studies found that there is a strong relationship between money supply and stock market, while others showed that monetary shocks do not have profound impact on stock market. It is worth to take note that most of the studies are using the nominal stock prices as the proxy of stock returns, only few of them are testing on the real stock prices.

Sprinkel (1964), the pioneer researcher in the study of money supply-stock market nexus, discovers that there is a strong relationship between the stock market and money supply in the U.S. Studies by other researchers, among others, Palmer (1970), Homa and Jafee (1971), Cooper (1974), Barro (1977, 1978), Mishkin (1982), Sorensen (1982), Ho (1983), McGee and Stasiak (1985), Fung and Lie (1990), Lin (1993), and Thornton (1993) found that monetary policy does matter to the performance of stock market. A more recent study by Yamak and Kucukkale (2000) using quarterly stock data in Turkey from 1986:1-1999:3 report that anticipated component of monetary growth exerts a significant impact upon stock prices during the period under study. In Malaysia, Ibrahim (2002) applying traditional estimates and ARCH estimates of volatility examines the causal nexus between the return volatility and macroeconomics volatility. He finds that there is a bi-directional causality relationship between the M2 volatility and the stock return volatility.

While most studies indicate the money supply and stock market are cointegarted in the long run, Malliaropulos (1995) provides empirical support to the LRN of monetary policy in the U.K. stock market based on the model developed by Fisher and Seater (1993). Using quarterly data of money supply and real equity prices, he shows that the permanent positive shocks in money supply do not have the ability to affect the real equity prices in the long run.

The aim of this study is to ascertain empirically whether the notion of monetary neutrality hold in Malaysia stock market. If the neutrality proposition does not hold, then it has important monetary policy implication. This would suggest that the monetary expansion is effective as a policy tool to influence the stock market. This paper is organized as follows. Section I provides the introduction and Section II reviews the literatures of LRN hypothesis. The methodology method will be discussed in Section III. Section VI presents the empirical findings and the concluding remarks are given in Section V.

II. LITERATURE REVIEW

The LRN of money means that the values of real variables are invariant in the long run to changes in money stock. This monetary neutrality hypothesis has bread tremendous theoretical and empirical literature. The empirical testing approaches generally follow three different ways.

First, the LRN of money can be examined from a cross-country perspective. Using cross-country data on 62 countries, Dwyer and Hafer (1988) discover that permanent exogenous change in the level of money stock do not have lasting effect on real economic activity. Hsing (1990) conducts a LRN test on 20 OECD countries and his results are quite consistent with Lothian's (1985) findings, which show that money does not matter in the long run in that 20 OECD countries. The cross-section test on neutrality hypothesis has also been studied by Duck (1988, 1993) for a total of 33 economies (16 industrialised and 17 developing countries); Loef (1993) for 12 European Community member countries; Weber (1994) for the G7 countries; and Bhanumurthy (1999) for 9 developing countries. Most empirical findings are adherence to the classical dichotomy except for the study by Bhanumurthy (1999); the money supply in the countries under study is adjusting for the output in the long run.

The second method attempts to examine the LRN hypothesis by means of frequency-domain time series techniques. Using the low-frequency U.S. data on money, prices, output, and real interest rates, Lucas (1980) and Mills (1982) show that there is a long-run comovements between these data. Geweke (1982, 1986) develops a method that can be used to measure the linear dependence and feedback in a bivariate ARIMA model to decompose by frequency, and then uses it to test the LRN of money at both low and high frequencies. The findings by Geweke (1982, 1986) are consistent with Lucas (1980) and Mills (1982), which mean that monetary neutrality hypothesis cannot be rejected.

The third approach in testing LRN of money is pioneered by Fisher and Seater (1993). Since the LRN does not depends to the short-run effects of money shocks, the structural details in the economy become less important as a concern in the LRN test. Fisher and Seater (1993) point out it is appropriate to use a simple and nonstructural reduced-form bivariate vector-autoregressive model to examine the LRN of money. Money supply is assumed as an exogenous variable in the model. The inference about LRN propositions is based on the coefficient restrictions tests in the bivariate ARIMA model. LRN in this framework implies zero restrictions on the contemporary and lagged monetary variables in a bivariate regression on real macroeconomic variable.

According to Fisher and Seater (1993), a context of valid LRN test exists only when the order of integration of the monetary and real series is at least one and equal for both series. The order of integration is useful to show that there is a permanent stochastic change in the data because the consequences of an event cannot be inferred if the event does not exists. Also, it is important to know the order of integration as the potential long-run response of money supply to other real economic variables is depends on their relative orders of integration.

Applying Friedman and Schwartz (1982) data on prices, nominal and real income from 1869 to 1975 in U.S., Fisher and Seater (1993) reject the LRN of money with respect to real incomes. Boschen and Otrok (1994) conduct a similar study with Fisher and Seater (1993), employing the same data set with longer time period - 1869 to 1992. They point out that the rejection of LRN hypothesis by Fisher and Seater (1933) is due to the inclusion of the Great Depression period of 1930-39. Once the Great Depression years are excluded from the sample, the response of real economic variables to the monetary policy shock would converge to zero as the time horizon grows. However, Haug and Lucas (1997) contend that the inclusion of Great Depression decade is not the main cause of rejection the LRN. They find that neutrality proposition is hold in Canada for the period of 1914-94 by using the same model developed by Fisher and Seater (1993).

Serletis and Krause (1996) examine the LRN proposition using the Backus and Kehoe (1992) long and low frequency (price level, money supply, and real output) data set for 10 developed economies in the Fisher and Seater (1993) framework. Empirical results report that there are direct evidences in favor of LRN with respect to output for Australia, Canada, Denmark, Italy, U.K. and U.S. Bae and Ratti (2000) also utilizing a long and low frequency data set on money and output over 1884-1996 for Argentina and over 1912-1995 for Brazil in order to test on LRN of money and long-run superneutrality of money (LRSN). For both countries the real output and money series were found to be integrated of order one and two respectively. Within the Fisher and Seater (1993) framework, this finding suggests that money is long-run neutral in both countries.

In Mexico, Wallace (1999) provides an example that LRN are robust for two different money definitions. Following Fisher and Seater (1993) methodology and applies both M1 and M2 data for the period of 1932-92, he finds support to the notion that money does not matter in the long run. On the other hand, Olekalns (1996) shows evidence against LRN in Australia using M3 money supply, however, when M1 is used, the LRN appears to hold. Olekalns' (1996) finding is contrary with Bullard (1994), which indicates that LRN is more supportive when the definition of money is broader for the period of 1960-92 in U.S. In addition, Coe and Nason (1999) discover that the Fisher and Seater (1993) rejection of LRN is not robust to a change in either the measure of money or the country of study. These studies imply that the LRN test might sensitive to the different money measurement.

Although there is a handful literature in the LRN of money, not much attention has been focused on using seasonally adjusted low-frequency data. Ermini and Chang (1996), perhaps is the first one. In their study, when standard cointegration tests are employed to test the joint hypotheses of LRN and rational expectations using quarterly seasonally adjusted data in Korea, the LRN of money is rejected. Nevertheless, with seasonal cointegration and seasonally unadjusted data, the neutrality proposition is hold. As a result, they conclude that the seasonal adjustment might distort test outcomes by introducing noninvertibility at the seasonal frequency or by failing to take into account the existing of cointegrating relations at these frequencies.

Han and Handa (2000) conduct the same joint hypothesis test as Ermini and Chang (1996) in Canada. In order to examine the appropriateness of using seasonally adjusted data, they employ the Lee's seasonal cointegration on the unadjusted data and Johansen's cointegration on the corresponding seasonally adjusted data. Their findings cast doubt on the usefulness of cointegration results from seasonally adjusted data as LRN is not rejected for the unadjusted data but is rejected for the seasonally adjusted data.

Leong and McAleer (2000) consider the LRN hypothesis in Australia using both quarterly seasonally unadjusted and adjusted data on real GDP and nominal money supply. The potential effects of different money measurement on real output is examined through a reduced-form bivariate ARIMA model developed by Fisher and Seater (1993). The boarder money M3 shows the ability to affect the real output in the long run but not for narrow defined money supply, M1. Leong and McAleer (2000) contend that this disparity might attribute to the recent demand-side disturbances and the easing of monetary policy in Australia.

III. METHODOLOGY

This study applies Fisher and Seater (1993) methodology to test LRN of money on stock market in Malaysia using three different definitions of money, namely, M1 M2, and M3 with respect to real stock prices. The model is as follows:

$$\begin{aligned} a(L)\Delta^{\langle m\rangle} m_t &= b(L)\Delta^{\langle y\rangle} y_t + u_t \\ d(L)\Delta^{\langle y\rangle} y_t &= c(L)\Delta^{\langle m\rangle} m_t + w_t \end{aligned} \tag{1}$$

where m is log money supply and y the log of real stock prices. L is the lag operator, Δ represents the first differences, $a(L)$, $b(L)$, $c(L)$ and $d(L)$ are distributed lag polynomials, and $\langle m\rangle$ and $\langle y\rangle$ are the orders of integration of the money supply, m_t, and real stock prices, y_t. The vector $(u_t\ w_t)'$ of error terms is assumed to be independently and identically distributed with mean zero and covariance $\sum$. LRN can be defined in terms of the long-run derivative (*LRD*) of $\Delta^{<y>}y_t$ with respect to a permanent change in $\Delta^{<m>}m_t$.

$$LRD_{y,m} \equiv \lim_{k \to \infty} \frac{\partial(\Delta^{\langle y \rangle} y_{t+k}) / \partial u_t}{\partial(\Delta^{\langle m \rangle} m_{t+k}) / \partial u_t}$$

where $\lim_{k \to \infty} \partial(\Delta^{<m>}m_{t+k})/\partial u_t \neq 0$. $LRD_{y,m}$ is defined as the long-run effect of a permanent change in *m* on *y* divided by the long-run effect of the same permanent change on *m* itself. Fisher and Seater (1993) point out, if $\lim_{k \to \infty} \partial(\Delta^{<m>}m_{t+k})/\partial u_t = 0$, there are no permanent changes to the level of money and LRN of money cannot be tested. The specific value of the $LRD_{y,m}$ depends on $\langle m \rangle$ and $\langle y \rangle$. When $\langle m \rangle \geq 1$ and $\langle y \rangle \geq 1$, there are permanent changes in both m_t and y_t. If the variables have the same order of integration, $\langle m \rangle = \langle y \rangle$, $LRD_{y,m}$ can be treated as the long-run elasticity of *y* with respect to *m* and it can be evaluated using the impulse response representation of Equation (1). The special case occur when $\langle m \rangle = \langle y \rangle = 1$, $LRD_{y,m} = c(1)/d(1)$. Money is long-run neutral if $LRD_{y,m} = \lambda$, where $\lambda = 1$ if *y* is a nominal variable, and $\lambda = 0$ if *y* is a real variable.

When the error terms u_t and w_t in the ARIMA model are uncorrected, or when money is exogenous, $c(1)/d(1)$ is the frequency-zero coefficient in a regression of $\Delta^{\langle y \rangle}y_t$ on $\Delta^{\langle m \rangle}m_t$. The term $c(1)/d(1)$ can be estimated using the Bartlett estimator of the frequency-zero regression coefficient. This estimator is given by $\lim_{k \to \infty}\beta_k$, where β_k is the slope coefficient in the following regression:

$$\left[\sum_{j=0}^{k} \Delta^{\langle y \rangle} y_{t-j}\right] = \alpha_k + \beta_k \left[\sum_{j=0}^{k} \Delta^{\langle m \rangle} m_{t-j}\right] + \varepsilon_{kt} \tag{2}$$

When $\langle m \rangle = \langle y \rangle = 1$, LRN can be tested. Ordinary least squares will provide consistent estimates of β_k from the below equation:

$$(y_t - y_{t-k-1}) = \alpha_k + \beta_k (m_t - m_{t-k-1}) + \varepsilon_{kt} \tag{3}$$

Sources of Data

The LRN analysis is conducted for the Malaysian stock market using monthly seasonally adjusted data of M1, M2, M3, and the real stock price indexes span from 1978:1 to 1999:12. There are twelve stock indexes being used: Composite Index, Construction Index, Consumers Index, Emas Index, Finance Index, Industrial Index, Industrial Product Index, Mining Index, Plantation Index, Property Index, Second Board Index, and Trading Index. The seasonal adjustment is needed to remove the cyclical fluctuations in the data because seasonality and business cycles are typically correlated, which in term can distort the data. Data for monetary aggregates are collected from various issues of the Monthly Statistical Bulletin published by Bank Negara Malaysia. The monthly stock price indexes data are compiled from various issues of the investor digest. All series are in the natural logarithm form.

III. THE EMPIRICAL RESULTS

Results on the Properties of Time Series

Following Fisher and Seater (1993), the order of identification of monetary aggregates and real macroeconomic variables determine the appropriate LRN model. Thus, the order of integration of the series for money supply and real stock returns has to be identified. In view of this, we conduct the Augmented Dickey-Fuller (ADF) (Said and Dickey, 1984), Phillips-Perron (PP) (Phillips and Perron, 1988), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) (Kwiatkowski et al., 1992) unit root tests to test for the integrating properties of each series on the level and the first difference of their natural logarithms.

Table 1 presents the ADF, PP, and KPSS unit root tests results for the log level as well as the log first difference of the series. We report the results, which contain a constant with trend for the series in level and constant without trend for the series in first difference. Empirical evidence suggests that each series has one unit root, which consistent with the view that real stock returns and the money stock are $I(1)$. Consequently, this implies that the variables are informative to LRN tests.

The Long-Run Neutrality Test Results

Results on the properties of time series from the unit root tests suggest that Equation (3) is testable. All the series appear to be $I(1)$, therefore, the long-run derivatives can be defined since the are permanent stochastic shocks in the money supply and real stock prices. Equation (3) is estimated for each of the twelve series with k equal from 1-21 to 1-32. The lag length k is chosen by $n/3$, where n is the number of observations. The error term, ε_{kt}, from the regression for the various lags may be non-spherical, possibly leading to biased t-ratios and outcomes of the LRN tests. Thus, following Fisher and Seater (1993), the standard error of β_k has been calculated using the Newey and West (1987) procedure to correct for autocorrelation.

Estimated results of Equation (3) are then presented in both tabulate and graphical form. In the tabulate form, we present the values of estimated coefficients (β_k), Newey-West standard error (SE_k), t-statistic of null hypothesis (t_k) and the marginal significance level of null hypothesis (p-value). The null hypothesis is $\beta_k = 0$ for y is a real variable. Test outcomes for LRN also examined by a plot of the estimated coefficients, β_k, against the lag length k. The estimated coefficients are denoted by the solid line and the confidence intervals are denoted by the dashed line. The t-distribution with n/k degrees of freedom is used to construct the confidence intervals. The 95 percent confidence intervals are obtained using standard errors that are adjusted by the Newey-West (1987) technique.

Results from estimation of Equation (3) are reported in Tables 2 (a) to 13 (c). Empirical results show that the LRN hypothesis is supported using different measure of money supply except for M3 with Finance Index. Generally, the null hypothesis of slope coefficient β_k equals zero cannot be rejected for all money series. The estimated coefficients are all not statistically significant from zero for all money series except at $k >$

23 for M3 with Finance index. This implies that permanent changes in money supply in Malaysia do not have long run effect on the level of real stock returns.

The corresponding graphical presentations of LRN tests are depicted in Figures 1 (a) to 12 (c). We found that the point estimates of β_k track closely to the zero line for all money series (except for M3 on Finance index at $k > 23$) and they are contained within the 95 percent confidence interval for all values of *k*. This indicating that money supply is long-run neutral with respect to real stock returns in Malaysia.

VI. CONCLUSION REMARKS

This paper investigates the LRN of money on stock market using long, high frequency seasonally adjusted data for Malaysia. Three different definitions of money supply have been used to examine the sensitivity of real stock returns with respect to different measurement of monetary aggregates. All the series appears to be $I(1)$, indicating a direct evidence of LRN. We find evidence to support the LRN proposition in Malaysian stock market expect for M3 on Finance Index. The outcomes are robust when different measures of money supply are considered. This would suggest that the permanent stochastic changes in money supply do not affect real stock returns in Malaysia. As such, the expansionary monetary policy might not being an effective policy instrument to stimulate the stock market performance. Our findings adherence to the modern Classical theory that asserts the policy ineffectiveness proposition, which states that systematic monetary policy, will be rationally anticipated and the anticipated changes in this policy will not affect output, unemployment, and other real variables in the economy.

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Table 1: Unit Root Test Results for Series in Levels and First Differences

Variables	ADF	PP	KPSS
		Level	
LM1	-1.93(4)	-2.28(4)	0.62(4)**
LM2	-2.59(4)	-3.14(4)	0.73(4)**
LM3	-2.87(4)	-3.37(4)	0.37(4)**
LCI	-2.50(4)	-2.64(4)	0.28(4)**
LCONST	-1.62(3)	-1.91(3)	0.25(3)**
LCSR	-1.43(3)	-2.01(3)	0.27(3)**
LEMAS	-2.52(4)	-2.65(4)	0.41(4)**
LFIN	-1.88(4)	-2.10(4)	0.20(4)*
LIND	-2.39(4)	-2.57(4)	0.30(4)**
LINDPRO	-1.43(3)	-1.96(3)	0.22(3)**
LMIN	-2.45(4)	-2.53(4)	0.36(4)**
LPLANT	-2.44(4)	-2.90(4)	0.21(4)*
LPPT	-2.19(4)	-2.30(4)	0.31(4)**
L2ND	-1.46(4)	-1.56(4)	0.37(4)**
LTRAD	-1.77(3)	-2.17(3)	0.17(3)*
		First Difference	
ΔLM1	-8.18(4)**	-19.05(4)**	0.06(4)
ΔLM2	-9.20(4)**	-17.93(4)**	0.19(4)
ΔLM3	-6.92(4)**	-13.91(4)**	0.33(4)
ΔLCI	-7.23(4)**	-14.56(4)**	0.09(4)
ΔLCONST	-4.80(3)**	-7.90(3)**	0.12(3)
ΔLCSR	-4.40(3)**	-8.34(3)**	0.10(3)
ΔLEMAS	-7.01(4)**	-15.29(4)**	0.08(4)
ΔLFIN	-6.30(4)**	-12.30(4)**	0.08(4)
ΔLIND	-7.38(4)**	-14.76(4)**	0.09(4)
ΔLINDPRO	-4.45(3)**	-8.29(3)**	0.10(3)
ΔLMIN	-7.19(4)**	-15.92(4)**	0.05(4)
ΔLPLANT	-7.78(4)**	-18.89(4)**	0.11(4)
ΔLPPT	-6.55(4)**	-14.81(4)**	0.21(4)
ΔL2ND	-3.54(4)**	-8.58(4)**	0.17(4)
ΔLTRAD	-5.04(3)**	-7.42(3)**	0.09(3)

Notes: Asterisks (*) and (**) denote significance at 5% and 1% levels, respectively. LCI, LCONST, LCRS, LEMAS, LFIN, LIND, LINDPRO, LMIN, LPLANT, LPPT, L2ND and LTRAD are the natural logarithm of real Composite index, real Construction index, real Consumer index, real Emas index, real Finance index, real Industrial index, real Industrial Product index, real Mining index, real Plantation index, real Property index, real Second Board index, and real Trading index, respectively. The optimal lag lengths were chosen based on Schwert (1987) formula, where $k = [4(T/100)^{1/4}]$.

Table 2 (a): *Long-run regressions of real Composite Index on M1*

k	β_k	SE_k	t_k	p-value
1	0.170	0.237	0.718	0.474
2	0.120	0.251	0.479	0.632
3	0.101	0.266	0.377	0.706
4	0.092	0.282	0.328	0.743
5	0.091	0.295	0.309	0.758
6	0.095	0.309	0.307	0.759
7	0.101	0.321	0.315	0.753
8	0.110	0.333	0.329	0.742
9	0.119	0.344	0.347	0.729
10	0.130	0.355	0.366	0.715
11	0.141	0.366	0.386	0.700
12	0.152	0.376	0.405	0.686
13	0.162	0.385	0.420	0.675
14	0.169	0.394	0.428	0.669
15	0.172	0.402	0.428	0.669
16	0.173	0.410	0.422	0.674
17	0.171	0.417	0.411	0.682
18	0.169	0.424	0.400	0.690
19	0.168	0.431	0.391	0.696
20	0.169	0.436	0.387	0.699
21	0.171	0.442	0.387	0.699
22	0.175	0.446	0.392	0.696
23	0.179	0.451	0.398	0.691
24	0.184	0.454	0.404	0.686
25	0.187	0.457	0.408	0.684
26	0.188	0.460	0.409	0.683
27	0.188	0.462	0.407	0.685
28	0.187	0.465	0.402	0.688
29	0.185	0.467	0.396	0.693
30	0.183	0.469	0.390	0.697
31	0.182	0.471	0.386	0.700
32	0.182	0.472	0.385	0.701

Table 2 (b): *Long-run regressions of real Composite Index on M2*

k	β_k	SE_k	t_k	p-value
1	0.278	0.338	0.823	0.411
2	0.131	0.380	0.344	0.731
3	-0.004	0.417	-0.009	0.993
4	-0.108	0.447	-0.242	0.809
5	-0.183	0.470	-0.388	0.698
6	-0.235	0.490	-0.479	0.632
7	-0.271	0.508	-0.532	0.595
8	-0.292	0.525	-0.555	0.579
9	-0.299	0.541	-0.553	0.581
10	-0.297	0.558	-0.531	0.596
11	-0.286	0.576	-0.496	0.621
12	-0.267	0.594	-0.450	0.653
13	-0.248	0.613	-0.405	0.686
14	-0.233	0.630	-0.369	0.712
15	-0.224	0.647	-0.346	0.730
16	-0.223	0.662	-0.337	0.737
17	-0.230	0.676	-0.340	0.734
18	-0.241	0.690	-0.349	0.727
19	-0.253	0.704	-0.359	0.720
20	-0.261	0.719	-0.364	0.716
21	-0.265	0.733	-0.361	0.719
22	-0.261	0.747	-0.349	0.727
23	-0.251	0.761	-0.330	0.742
24	-0.236	0.773	-0.305	0.761
25	-0.217	0.785	-0.277	0.782
26	-0.198	0.795	-0.249	0.804
27	-0.179	0.805	-0.223	0.824
28	-0.163	0.813	-0.200	0.842
29	-0.149	0.821	-0.181	0.856
30	-0.139	0.828	-0.167	0.867
31	-0.131	0.834	-0.157	0.875
32	-0.127	0.840	-0.151	0.880

Table 2 (c): *Long-run regressions of real Composite Index on M3*

k	β_k	SE_k	t_k	p-value
1	0.810	0.792	1.022	0.308
2	0.938	0.816	1.149	0.252
3	1.041	0.840	1.240	0.217
4	1.116	0.869	1.285	0.201
5	1.183	0.900	1.314	0.191
6	1.251	0.929	1.346	0.180
7	1.327	0.953	1.392	0.166
8	1.414	0.974	1.452	0.149
9	1.510	0.995	1.517	0.132
10	1.608	1.020	1.577	0.117
11	1.707	1.048	1.628	0.106
12	1.815	1.078	1.684	0.094
13	1.922	1.107	1.735	0.085
14	2.018	1.135	1.779	0.078
15	2.094	1.160	1.805	0.073
16	2.142	1.187	1.804	0.073
17	2.162	1.218	1.775	0.078
18	2.166	1.256	1.725	0.087
19	2.167	1.299	1.668	0.098
20	2.180	1.346	1.619	0.108
21	2.215	1.393	1.589	0.114
22	2.276	1.438	1.583	0.116
23	2.364	1.477	1.601	0.112
24	2.461	1.513	1.627	0.106
25	2.572	1.542	1.667	0.098
26	2.688	1.568	1.715	0.089
27	2.802	1.590	1.763	0.080
28	2.908	1.610	1.806	0.073
29	3.000	1.630	1.841	0.068
30	3.074	1.648	1.865	0.065
31	3.128	1.665	1.879	0.063
32	3.164	1.681	1.882	0.062

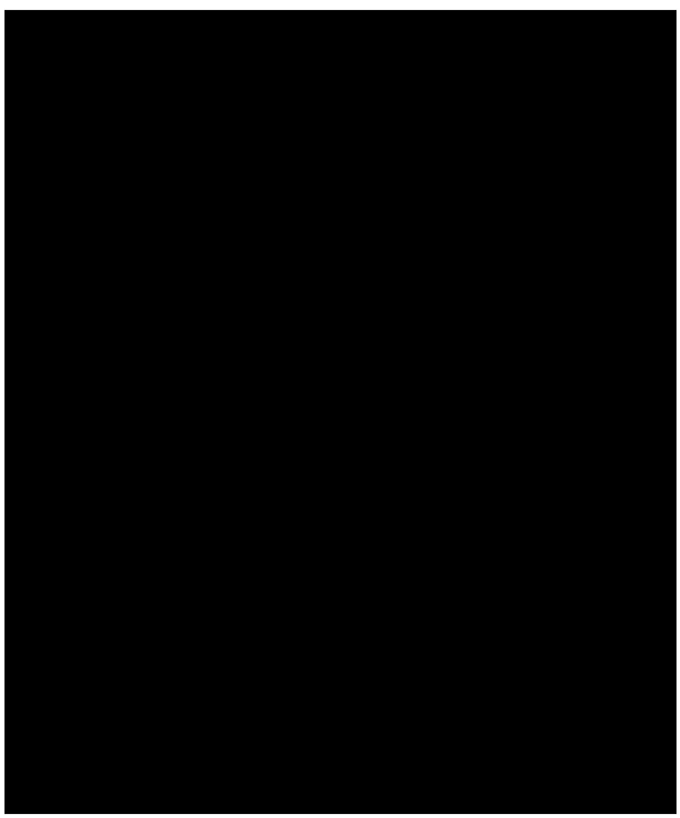

Table 3 (a): *Long-run regressions of real Construction Index on M1*				
k	β_k	SE_k	t_k	*p*-value
1	0.122	0.716	0.170	0.865
2	0.068	0.766	0.089	0.929
3	0.071	0.816	0.087	0.931
4	0.088	0.860	0.102	0.919
5	0.123	0.894	0.137	0.892
6	0.176	0.917	0.192	0.849
7	0.245	0.930	0.263	0.793
8	0.326	0.937	0.348	0.729
9	0.416	0.938	0.443	0.660
10	0.507	0.938	0.541	0.591
11	0.598	0.941	0.636	0.528
12	0.685	0.949	0.722	0.474
13	0.767	0.964	0.795	0.430
14	0.842	0.988	0.852	0.399
15	0.905	1.019	0.888	0.379
16	0.899	1.023	0.879	0.384
17	0.871	1.024	0.850	0.400
18	0.823	1.021	0.806	0.425
19	0.764	1.016	0.752	0.456
20	0.705	1.012	0.696	0.490
21	0.654	1.015	0.644	0.523

Table 3 (b): *Long-run regressions of real Construction Index on M2*				
k	β_k	SE_k	t_k	*p*-value
1	-1.330	1.402	-0.948	0.347
2	-1.490	1.816	-0.821	0.415
3	-1.706	2.175	-0.784	0.436
4	-1.889	2.463	-0.767	0.446
5	-1.926	2.711	-0.710	0.480
6	-1.810	2.926	-0.618	0.539
7	-1.549	3.119	-0.497	0.621
8	-1.139	3.309	-0.344	0.732
9	-0.569	3.516	-0.162	0.872
10	0.173	3.745	0.046	0.963
11	1.077	3.966	0.272	0.787
12	2.077	4.137	0.502	0.618
13	3.045	4.255	0.716	0.478
14	3.846	4.355	0.883	0.382
15	4.402	4.480	0.982	0.331
16	4.672	4.599	1.016	0.315
17	4.758	4.750	1.002	0.322
18	4.739	4.908	0.966	0.340
19	4.695	5.037	0.932	0.357
20	4.678	5.118	0.914	0.366
21	4.707	5.153	0.913	0.366

Table 3 (c): *Long-run regressions of real Construction Index on M3*				
k	β_k	SE_k	t_k	*p*-value
1	0.038	1.956	0.020	0.984
2	0.047	2.493	0.019	0.985
3	0.106	2.919	0.036	0.971
4	0.053	3.280	0.016	0.987
5	0.050	3.580	0.014	0.989
6	0.185	3.807	0.049	0.961
7	0.490	3.956	0.124	0.902
8	0.965	4.055	0.238	0.813
9	1.587	4.154	0.382	0.704
10	2.309	4.298	0.537	0.594
11	3.048	4.499	0.677	0.501
12	3.688	4.722	0.781	0.438
13	4.121	4.912	0.839	0.406
14	4.292	5.036	0.852	0.398
15	4.221	5.114	0.825	0.413
16	3.830	5.172	0.741	0.463
17	3.331	5.286	0.630	0.532
18	2.824	5.482	0.515	0.609
19	2.422	5.762	0.420	0.676
20	2.247	6.111	0.368	0.715
21	2.403	6.489	0.370	0.713

Figure 2 (a): Real Construction on Money, M1: 1993:9-1999:12

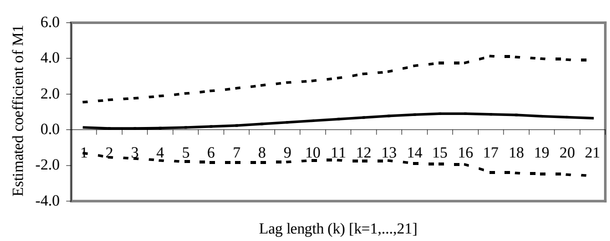

Figure 2 (b): Real Construction on Money, M2: 1993:9-1999:12

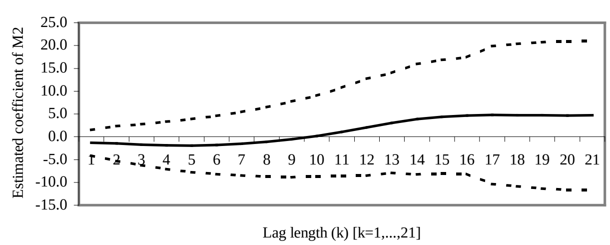

Figure 2 (c): Real Construction on Money, M3: 1993:9-1999:12

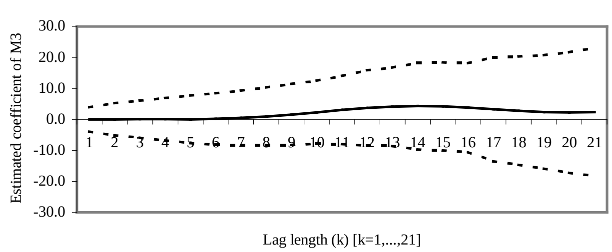

Table 4 (a): *Long-run regressions of real Consumer Index on M1*

k	β_k	SE_k	t_k	*p*-value
1	0.180	0.486	0.370	0.712
2	0.122	0.523	0.233	0.817
3	0.113	0.559	0.203	0.840
4	0.103	0.585	0.176	0.861
5	0.090	0.606	0.149	0.882
6	0.085	0.625	0.135	0.893
7	0.092	0.640	0.143	0.887
8	0.110	0.652	0.169	0.866
9	0.136	0.663	0.205	0.838
10	0.162	0.673	0.240	0.811
11	0.183	0.684	0.267	0.790
12	0.197	0.698	0.283	0.778
13	0.204	0.715	0.286	0.776
14	0.202	0.734	0.275	0.784
15	0.189	0.755	0.250	0.803
16	0.141	0.756	0.187	0.853
17	0.079	0.755	0.105	0.917
18	0.007	0.749	0.010	0.992
19	-0.069	0.741	-0.093	0.926
20	-0.143	0.731	-0.195	0.846
21	-0.208	0.723	-0.288	0.775

Table 4 (b): *Long-run regressions of real Consumer Index on M2*

k	β_k	SE_k	t_k	*p*-value
1	-0.830	1.077	-0.771	0.444
2	-1.148	1.228	-0.935	0.354
3	-1.497	1.338	-1.119	0.268
4	-1.830	1.412	-1.296	0.200
5	-2.053	1.512	-1.358	0.180
6	-2.134	1.628	-1.311	0.195
7	-2.062	1.739	-1.186	0.241
8	-1.835	1.846	-0.994	0.325
9	-1.470	1.967	-0.747	0.458
10	-0.994	2.117	-0.470	0.641
11	-0.449	2.289	-0.196	0.845
12	0.110	2.458	0.045	0.964
13	0.607	2.600	0.234	0.816
14	0.974	2.712	0.359	0.721
15	1.177	2.809	0.419	0.677
16	1.248	2.876	0.434	0.666
17	1.213	2.949	0.411	0.683
18	1.121	3.024	0.371	0.713
19	1.022	3.085	0.331	0.742
20	0.953	3.120	0.306	0.762
21	0.933	3.121	0.299	0.767

Table 4 (c): *Long-run regressions of real Consumer Index on M3*

k	β_k	SE_k	t_k	*p*-value
1	-0.091	1.475	-0.062	0.951
2	-0.448	1.655	-0.271	0.787
3	-0.759	1.774	-0.428	0.670
4	-1.185	1.824	-0.650	0.519
5	-1.550	1.880	-0.825	0.413
6	-1.757	1.935	-0.908	0.368
7	-1.774	1.969	-0.901	0.372
8	-1.601	1.986	-0.806	0.424
9	-1.281	2.020	-0.634	0.529
10	-0.881	2.105	-0.418	0.677
11	-0.484	2.246	-0.215	0.830
12	-0.172	2.405	-0.072	0.943
13	-0.010	2.536	-0.004	0.997
14	-0.026	2.611	-0.010	0.992
15	-0.213	2.635	-0.081	0.936
16	-0.646	2.588	-0.250	0.804
17	-1.202	2.537	-0.474	0.638
18	-1.841	2.510	-0.734	0.467
19	-2.508	2.539	-0.988	0.329
20	-3.136	2.650	-1.183	0.243
21	-3.651	2.843	-1.284	0.206

Figure 3 (a): Real Consumer Index on Money, M1: 1993:9-1999:12

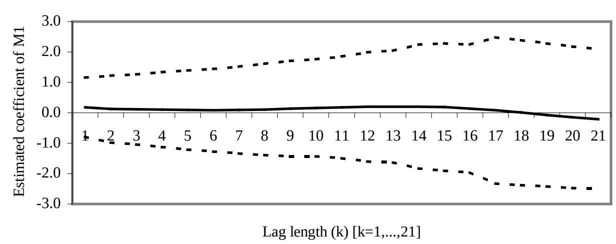

Figure 3 (b): Real Consumer Index on Money, M2: 1993:9-1999:12

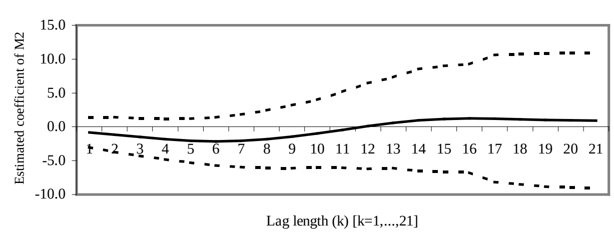

Figure 3 (c): Real Consumer Index on Money, M3: 1993:9-1999:12

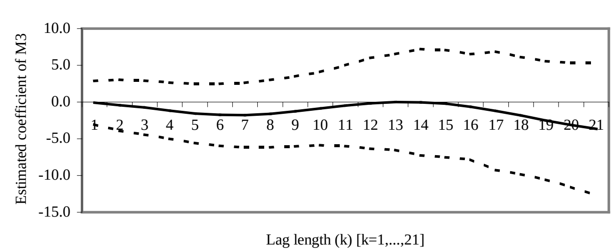

Table 5 (a): *Long-run regressions of real Emas Index on M1*

k	β_k	SE_k	t_k	*p*-value
1	0.085	0.282	0.303	0.763
2	0.025	0.304	0.081	0.935
3	0.015	0.328	0.047	0.963
4	0.026	0.351	0.075	0.940
5	0.046	0.373	0.124	0.902
6	0.070	0.394	0.178	0.859
7	0.098	0.414	0.236	0.814
8	0.129	0.433	0.298	0.766
9	0.162	0.450	0.361	0.719
10	0.197	0.466	0.423	0.673
11	0.232	0.479	0.485	0.629
12	0.266	0.491	0.541	0.589
13	0.298	0.502	0.594	0.553
14	0.329	0.512	0.642	0.522
15	0.356	0.521	0.682	0.496
16	0.379	0.530	0.715	0.476
17	0.397	0.537	0.740	0.461
18	0.413	0.543	0.760	0.448
19	0.428	0.549	0.779	0.437
20	0.444	0.555	0.800	0.425
21	0.463	0.561	0.825	0.410
22	0.486	0.568	0.856	0.393
23	0.513	0.575	0.893	0.374
24	0.545	0.582	0.936	0.351
25	0.578	0.590	0.980	0.329
26	0.610	0.597	1.023	0.308
27	0.641	0.603	1.063	0.290
28	0.670	0.610	1.099	0.273
29	0.696	0.615	1.133	0.259
30	0.721	0.619	1.164	0.246
31	0.744	0.623	1.194	0.234
32	0.765	0.625	1.225	0.223

Table 5 (b): *Long-run regressions of real Emas Index on M2*

k	β_k	SE_k	t_k	*p*-value
1	0.441	0.495	0.891	0.374
2	0.380	0.565	0.671	0.503
3	0.317	0.628	0.505	0.615
4	0.275	0.682	0.402	0.688
5	0.254	0.731	0.347	0.729
6	0.253	0.778	0.325	0.745
7	0.277	0.823	0.336	0.737
8	0.327	0.866	0.377	0.706
9	0.402	0.907	0.443	0.659
10	0.495	0.945	0.524	0.601
11	0.601	0.982	0.612	0.541
12	0.701	1.015	0.691	0.491
13	0.798	1.046	0.763	0.447
14	0.885	1.076	0.823	0.412
15	0.957	1.106	0.865	0.388
16	1.012	1.137	0.890	0.375
17	1.050	1.169	0.898	0.370
18	1.075	1.200	0.895	0.372
19	1.091	1.230	0.887	0.376
20	1.105	1.258	0.878	0.381
21	1.121	1.284	0.874	0.384
22	1.141	1.306	0.874	0.383
23	1.165	1.324	0.880	0.380
24	1.189	1.339	0.888	0.376
25	1.214	1.351	0.899	0.370
26	1.235	1.360	0.908	0.365
27	1.252	1.367	0.916	0.361
28	1.264	1.373	0.921	0.359
29	1.271	1.378	0.923	0.358
30	1.274	1.382	0.922	0.358
31	1.273	1.385	0.919	0.360
32	1.269	1.389	0.913	0.363

Table 5 (c): *Long-run regressions of real Emas Index on M3*

k	β_k	SE_k	t_k	*p*-value
1	0.836	0.732	1.142	0.255
2	0.921	0.782	1.178	0.241
3	1.008	0.832	1.212	0.227
4	1.076	0.881	1.222	0.224
5	1.140	0.928	1.228	0.221
6	1.205	0.969	1.243	0.216
7	1.280	1.004	1.274	0.205
8	1.368	1.035	1.322	0.188
9	1.467	1.065	1.377	0.171
10	1.573	1.099	1.431	0.155
11	1.682	1.137	1.479	0.141
12	1.801	1.177	1.530	0.128
13	1.917	1.217	1.576	0.117
14	2.019	1.253	1.612	0.109
15	2.098	1.287	1.631	0.105
16	2.148	1.322	1.625	0.106
17	2.173	1.362	1.595	0.113
18	2.185	1.410	1.550	0.124
19	2.203	1.465	1.504	0.135
20	2.243	1.522	1.474	0.143
21	2.313	1.576	1.468	0.145
22	2.417	1.625	1.487	0.139
23	2.549	1.666	1.530	0.129
24	2.690	1.704	1.579	0.117
25	2.839	1.735	1.636	0.104
26	2.985	1.762	1.694	0.093
27	3.122	1.786	1.748	0.083
28	3.244	1.809	1.794	0.075
29	3.348	1.830	1.829	0.070
30	3.433	1.850	1.855	0.066
31	3.499	1.870	1.871	0.064
32	3.549	1.889	1.879	0.063

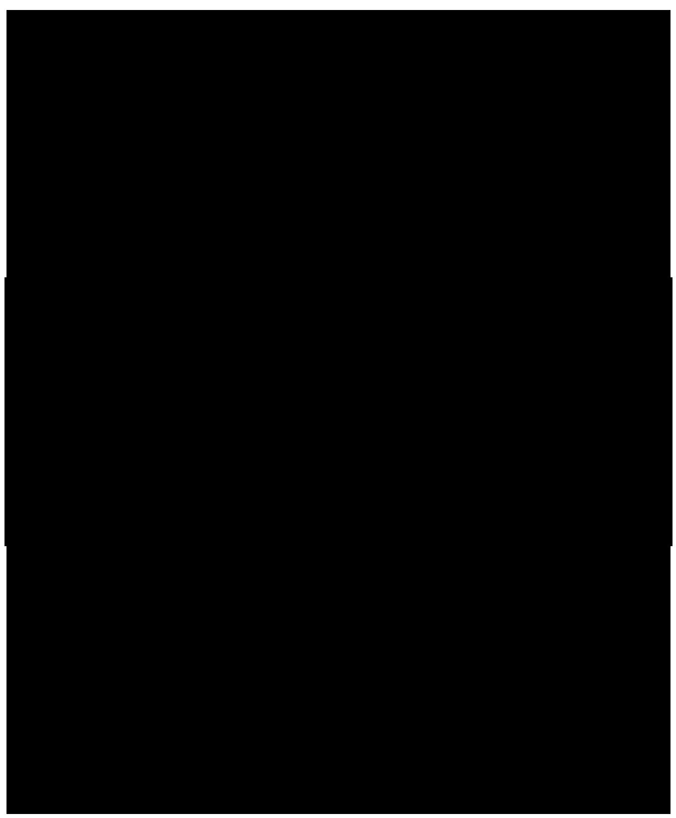

Table 6 (a): *Long-run regressions of real Finance Index on M1*

k	β_k	SE_k	t_k	p-value
1	0.173	0.310	0.558	0.577
2	0.140	0.316	0.442	0.659
3	0.142	0.328	0.432	0.666
4	0.156	0.342	0.457	0.648
5	0.176	0.355	0.496	0.620
6	0.197	0.367	0.537	0.592
7	0.218	0.380	0.575	0.566
8	0.240	0.392	0.612	0.541
9	0.262	0.404	0.649	0.517
10	0.284	0.415	0.685	0.494
11	0.307	0.425	0.721	0.472
12	0.329	0.435	0.756	0.450
13	0.348	0.444	0.784	0.434
14	0.364	0.452	0.804	0.422
15	0.374	0.460	0.813	0.417
16	0.380	0.468	0.813	0.417
17	0.383	0.475	0.808	0.420
18	0.385	0.482	0.800	0.425
19	0.388	0.488	0.794	0.428
20	0.391	0.494	0.792	0.429
21	0.397	0.499	0.795	0.427
22	0.403	0.504	0.801	0.424
23	0.409	0.507	0.807	0.421
24	0.414	0.510	0.811	0.418
25	0.416	0.513	0.811	0.418
26	0.416	0.515	0.807	0.421
27	0.413	0.517	0.799	0.425
28	0.410	0.519	0.789	0.431
29	0.406	0.521	0.779	0.437
30	0.402	0.523	0.769	0.443
31	0.400	0.525	0.762	0.447
32	0.399	0.527	0.757	0.450

Table 6 (b): *Long-run regressions of real Finance Index on M2*

k	β_k	SE_k	t_k	p-value
1	0.418	0.428	0.976	0.330
2	0.341	0.507	0.673	0.502
3	0.263	0.561	0.469	0.640
4	0.204	0.600	0.340	0.735
5	0.164	0.628	0.262	0.794
6	0.139	0.650	0.214	0.831
7	0.124	0.668	0.186	0.853
8	0.121	0.685	0.177	0.860
9	0.131	0.700	0.186	0.852
10	0.152	0.715	0.213	0.831
11	0.185	0.730	0.253	0.800
12	0.228	0.744	0.306	0.760
13	0.271	0.759	0.357	0.722
14	0.307	0.775	0.397	0.692
15	0.332	0.790	0.421	0.674
16	0.344	0.804	0.428	0.669
17	0.345	0.819	0.422	0.673
18	0.341	0.833	0.409	0.683
19	0.336	0.848	0.396	0.692
20	0.336	0.864	0.389	0.697
21	0.345	0.879	0.392	0.696
22	0.361	0.894	0.404	0.687
23	0.384	0.909	0.423	0.673
24	0.412	0.922	0.447	0.655
25	0.442	0.934	0.473	0.637
26	0.470	0.945	0.498	0.619
27	0.496	0.955	0.519	0.604
28	0.517	0.964	0.537	0.592
29	0.535	0.972	0.550	0.583
30	0.548	0.980	0.559	0.577
31	0.558	0.987	0.565	0.573
32	0.565	0.994	0.568	0.570

Table 6 (c): *Long-run regressions of real Finance Index on M3*

k	β_k	SE_k	t_k	p-value
1	1.147	0.900	1.275	0.204
2	1.391	0.995	1.397	0.164
3	1.589	1.068	1.488	0.139
4	1.733	1.130	1.533	0.127
5	1.849	1.185	1.561	0.121
6	1.952	1.231	1.586	0.115
7	2.055	1.270	1.618	0.108
8	2.164	1.305	1.659	0.099
9	2.281	1.338	1.705	0.090
10	2.406	1.371	1.754	0.082
11	2.539	1.406	1.805	0.073
12	2.688	1.441	1.865	0.064
13	2.835	1.476	1.921	0.057
14	2.966	1.507	1.968	0.051
15	3.066	1.537	1.995	0.048
16	3.130	1.569	1.995	0.048
17	3.166	1.609	1.968	0.051
18	3.193	1.658	1.926	0.056
19	3.234	1.712	1.889	0.061
20	3.309	1.766	1.874	0.063
21	3.427	1.812	1.891	0.061
22	3.587	1.850	1.939	0.055
23	3.779	1.878	2.012	0.046
24	3.978	1.905	2.088	0.039
25	4.177	1.928	2.166	0.032
26	4.365	1.949	2.240	0.027
27	4.535	1.968	2.304	0.023
28	4.683	1.987	2.356	0.020
29	4.807	2.006	2.396	0.018
30	4.909	2.026	2.424	0.017
31	4.991	2.045	2.440	0.016
32	5.054	2.064	2.448	0.016

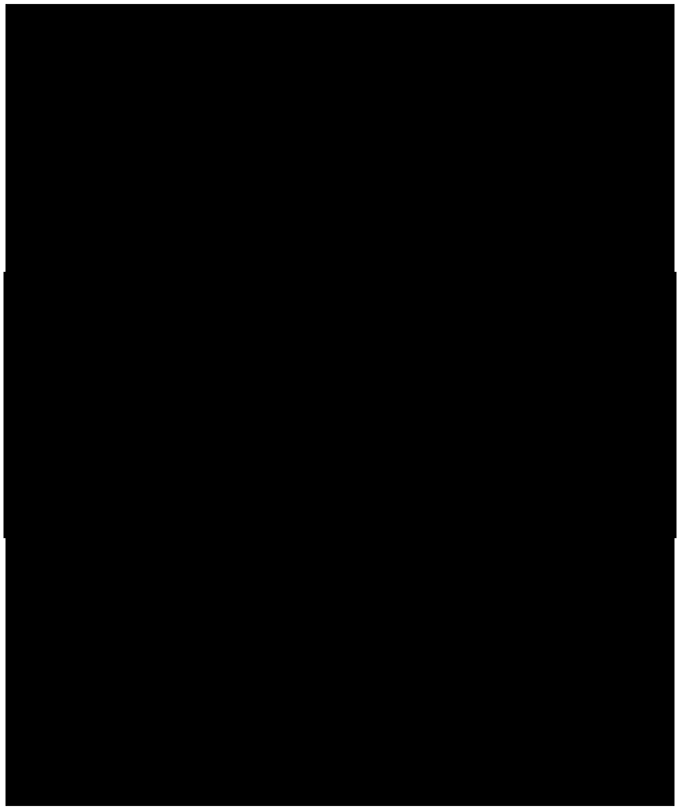

Table 7 (a): *Long-run regressions of real Industrial Index on M1*

k	β_k	SE_k	t_k	p-value
1	0.191	0.219	0.869	0.386
2	0.148	0.237	0.624	0.533
3	0.133	0.255	0.522	0.602
4	0.129	0.272	0.473	0.637
5	0.131	0.287	0.457	0.648
6	0.139	0.301	0.462	0.645
7	0.150	0.314	0.477	0.634
8	0.163	0.327	0.499	0.619
9	0.177	0.339	0.522	0.602
10	0.191	0.350	0.545	0.586
11	0.204	0.361	0.564	0.573
12	0.215	0.371	0.580	0.562
13	0.224	0.381	0.589	0.557
14	0.230	0.390	0.590	0.556
15	0.232	0.398	0.583	0.561
16	0.231	0.405	0.570	0.569
17	0.229	0.412	0.554	0.580
18	0.226	0.419	0.539	0.590
19	0.224	0.426	0.527	0.599
20	0.225	0.432	0.520	0.603
21	0.226	0.437	0.518	0.605
22	0.230	0.441	0.520	0.603
23	0.233	0.445	0.524	0.601
24	0.236	0.448	0.526	0.599
25	0.237	0.451	0.527	0.599
26	0.237	0.453	0.524	0.601
27	0.236	0.455	0.518	0.605
28	0.233	0.457	0.510	0.611
29	0.230	0.459	0.501	0.617
30	0.227	0.461	0.493	0.623
31	0.225	0.462	0.486	0.627
32	0.224	0.464	0.483	0.630

Table 7 (b): *Long-run regressions of real Industrial Index on M2*

k	β_k	SE_k	t_k	p-value
1	0.257	0.325	0.792	0.429
2	0.101	0.365	0.277	0.782
3	-0.040	0.400	-0.100	0.920
4	-0.150	0.429	-0.349	0.727
5	-0.228	0.453	-0.504	0.615
6	-0.283	0.473	-0.599	0.550
7	-0.320	0.489	-0.654	0.514
8	-0.341	0.505	-0.676	0.500
9	-0.349	0.519	-0.672	0.503
10	-0.347	0.535	-0.649	0.517
11	-0.339	0.551	-0.615	0.539
12	-0.326	0.568	-0.574	0.566
13	-0.314	0.584	-0.538	0.591
14	-0.307	0.600	-0.511	0.610
15	-0.306	0.616	-0.496	0.620
16	-0.311	0.630	-0.493	0.622
17	-0.321	0.644	-0.499	0.618
18	-0.335	0.658	-0.509	0.611
19	-0.347	0.672	-0.517	0.606
20	-0.356	0.687	-0.519	0.604
21	-0.359	0.701	-0.512	0.609
22	-0.355	0.714	-0.497	0.620
23	-0.346	0.727	-0.475	0.635
24	-0.331	0.739	-0.448	0.655
25	-0.314	0.749	-0.419	0.676
26	-0.296	0.758	-0.391	0.696
27	-0.280	0.767	-0.365	0.715
28	-0.266	0.775	-0.343	0.732
29	-0.255	0.781	-0.326	0.745
30	-0.247	0.788	-0.313	0.754
31	-0.242	0.793	-0.305	0.761
32	-0.239	0.799	-0.300	0.765

Table 7 (c): *Long-run regressions of real Industrial Index on M3*

k	β_k	SE_k	t_k	p-value
1	0.505	0.725	0.697	0.487
2	0.563	0.753	0.748	0.456
3	0.610	0.783	0.780	0.437
4	0.633	0.816	0.776	0.439
5	0.653	0.850	0.768	0.444
6	0.678	0.883	0.769	0.443
7	0.715	0.910	0.785	0.434
8	0.766	0.935	0.820	0.414
9	0.829	0.959	0.864	0.389
10	0.895	0.987	0.906	0.366
11	0.959	1.019	0.941	0.348
12	1.029	1.052	0.978	0.330
13	1.096	1.086	1.010	0.314
14	1.155	1.118	1.033	0.303
15	1.198	1.151	1.041	0.300
16	1.220	1.186	1.029	0.306
17	1.221	1.225	0.996	0.321
18	1.211	1.271	0.953	0.342
19	1.201	1.321	0.909	0.365
20	1.205	1.374	0.877	0.382
21	1.231	1.427	0.862	0.390
22	1.282	1.477	0.867	0.387
23	1.354	1.523	0.889	0.375
24	1.436	1.564	0.918	0.360
25	1.525	1.600	0.953	0.342
26	1.615	1.632	0.990	0.324
27	1.699	1.660	1.023	0.308
28	1.771	1.686	1.050	0.296
29	1.829	1.710	1.069	0.287
30	1.870	1.733	1.079	0.283
31	1.895	1.754	1.081	0.282
32	1.906	1.774	1.075	0.285

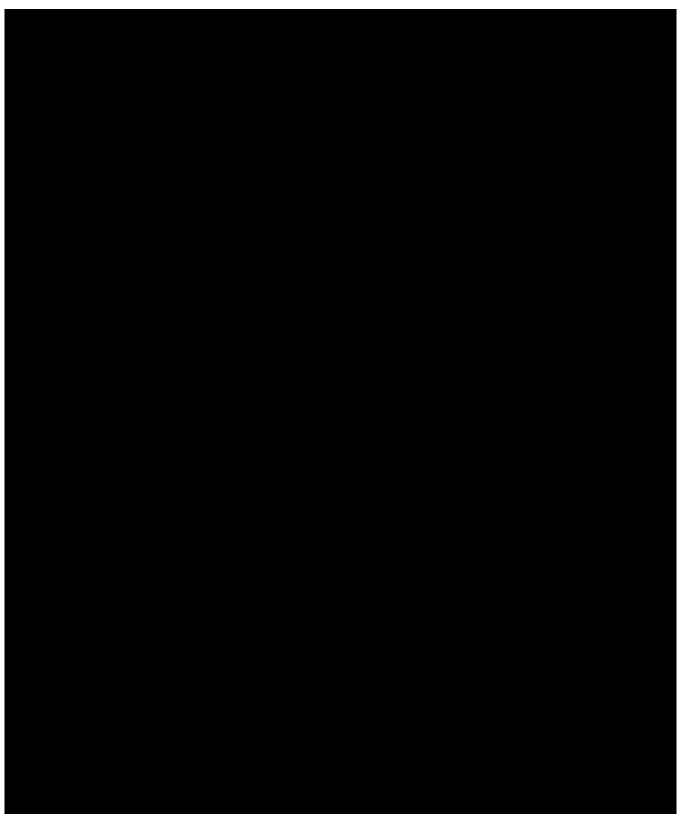

Table 8 (a): *Long-run regressions of real Industrial Product Index on M1*

k	β_k	SE_k	t_k	p-value
1	0.287	0.489	0.586	0.560
2	0.202	0.540	0.374	0.709
3	0.174	0.581	0.299	0.766
4	0.147	0.613	0.240	0.811
5	0.122	0.642	0.189	0.850
6	0.106	0.668	0.159	0.874
7	0.105	0.689	0.152	0.880
8	0.116	0.705	0.164	0.870
9	0.134	0.715	0.188	0.852
10	0.154	0.721	0.214	0.831
11	0.173	0.726	0.237	0.813
12	0.186	0.733	0.254	0.800
13	0.195	0.744	0.263	0.794
14	0.198	0.757	0.261	0.795
15	0.191	0.774	0.246	0.807
16	0.136	0.768	0.178	0.860
17	0.066	0.758	0.087	0.931
18	-0.018	0.743	-0.024	0.981
19	-0.108	0.725	-0.149	0.882
20	-0.196	0.706	-0.278	0.782
21	-0.276	0.690	-0.399	0.692

Table 8 (b): *Long-run regressions of real Industrial Product Index on M2*

k	β_k	SE_k	t_k	p-value
1	-0.729	1.093	-0.667	0.508
2	-1.015	1.284	-0.790	0.432
3	-1.344	1.415	-0.950	0.346
4	-1.657	1.519	-1.091	0.280
5	-1.865	1.656	-1.126	0.265
6	-1.937	1.808	-1.071	0.289
7	-1.863	1.954	-0.954	0.344
8	-1.633	2.091	-0.781	0.438
9	-1.243	2.230	-0.558	0.580
10	-0.699	2.375	-0.294	0.770
11	-0.030	2.507	-0.012	0.991
12	0.697	2.599	0.268	0.790
13	1.377	2.647	0.520	0.605
14	1.909	2.680	0.713	0.480
15	2.245	2.726	0.823	0.414
16	2.387	2.762	0.864	0.392
17	2.392	2.819	0.848	0.401
18	2.318	2.886	0.803	0.426
19	2.224	2.943	0.756	0.454
20	2.157	2.974	0.725	0.472
21	2.139	2.968	0.721	0.475

Table 8 (c): *Long-run regressions of real Industrial Product Index on M3*

k	β_k	SE_k	t_k	p-value
1	0.016	1.469	0.011	0.991
2	-0.270	1.655	-0.163	0.871
3	-0.501	1.772	-0.283	0.778
4	-0.834	1.846	-0.452	0.653
5	-1.109	1.938	-0.572	0.569
6	-1.239	2.029	-0.611	0.544
7	-1.192	2.087	-0.571	0.570
8	-0.960	2.111	-0.455	0.651
9	-0.563	2.131	-0.264	0.793
10	-0.051	2.187	-0.023	0.981
11	0.487	2.306	0.211	0.834
12	0.943	2.464	0.383	0.704
13	1.222	2.611	0.468	0.642
14	1.280	2.703	0.474	0.638
15	1.128	2.734	0.413	0.682
16	0.675	2.666	0.253	0.801
17	0.085	2.596	0.033	0.974
18	-0.588	2.554	-0.230	0.819
19	-1.279	2.580	-0.496	0.623
20	-1.905	2.696	-0.707	0.484
21	-2.383	2.896	-0.823	0.415

Figure 7 (a): Real Industrial Product Index on Money, M1: 1993:9-1999:12

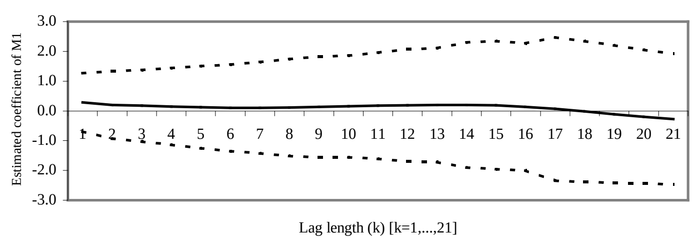

Figure 7 (b): Real Industrial Product Index on Money, M2: 1993:9-1999:12

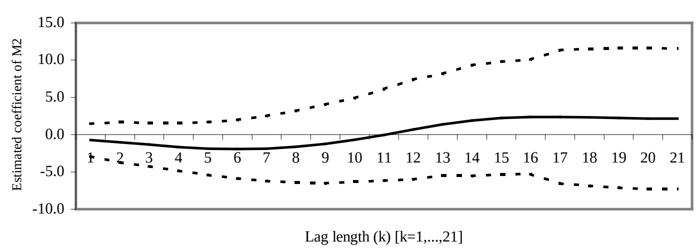

Figure 7 (c): Real Industrial Product Index on Money, M3: 1993:9-1999:12

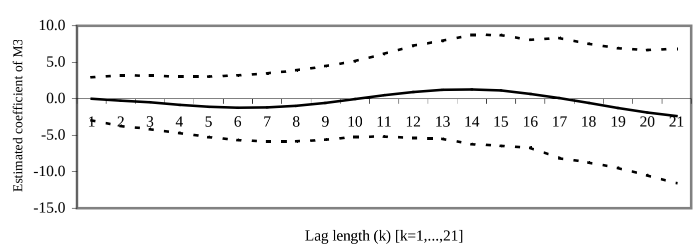

Table 9 (a): *Long-run regressions of real Mining Index on M1*

k	β_k	SE_k	t_k	p-value
1	0.387	0.348	1.112	0.267
2	0.316	0.389	0.813	0.417
3	0.302	0.430	0.703	0.483
4	0.311	0.467	0.666	0.506
5	0.332	0.502	0.661	0.509
6	0.358	0.533	0.672	0.503
7	0.388	0.562	0.690	0.491
8	0.421	0.589	0.715	0.475
9	0.457	0.614	0.745	0.457
10	0.496	0.637	0.778	0.437
11	0.535	0.658	0.813	0.417
12	0.574	0.678	0.846	0.398
13	0.610	0.697	0.876	0.382
14	0.642	0.714	0.899	0.369
15	0.669	0.730	0.917	0.360
16	0.692	0.743	0.931	0.353
17	0.712	0.756	0.942	0.347
18	0.731	0.767	0.953	0.342
19	0.750	0.777	0.965	0.335
20	0.770	0.786	0.980	0.328
21	0.791	0.794	0.996	0.320
22	0.811	0.801	1.013	0.312
23	0.830	0.806	1.030	0.304
24	0.846	0.810	1.045	0.297
25	0.859	0.813	1.056	0.292
26	0.867	0.816	1.063	0.289
27	0.871	0.818	1.065	0.288
28	0.872	0.819	1.065	0.288
29	0.873	0.821	1.063	0.289
30	0.873	0.822	1.062	0.289
31	0.875	0.823	1.063	0.289
32	0.880	0.824	1.068	0.287

Table 9 (b): *Long-run regressions of real Mining Index on M2*

k	β_k	SE_k	t_k	p-value
1	0.263	0.499	0.527	0.598
2	0.076	0.541	0.140	0.889
3	-0.085	0.581	-0.147	0.883
4	-0.210	0.614	-0.342	0.733
5	-0.302	0.642	-0.471	0.638
6	-0.370	0.666	-0.556	0.579
7	-0.418	0.688	-0.607	0.544
8	-0.447	0.710	-0.629	0.530
9	-0.456	0.731	-0.624	0.533
10	-0.450	0.754	-0.597	0.551
11	-0.432	0.777	-0.556	0.579
12	-0.408	0.803	-0.508	0.612
13	-0.386	0.830	-0.465	0.642
14	-0.372	0.856	-0.434	0.665
15	-0.366	0.881	-0.415	0.678
16	-0.368	0.906	-0.407	0.685
17	-0.376	0.930	-0.404	0.687
18	-0.384	0.954	-0.402	0.688
19	-0.389	0.979	-0.398	0.691
20	-0.388	1.004	-0.387	0.699
21	-0.379	1.029	-0.368	0.713
22	-0.362	1.054	-0.343	0.732
23	-0.337	1.077	-0.313	0.754
24	-0.306	1.099	-0.278	0.781
25	-0.274	1.120	-0.245	0.807
26	-0.244	1.138	-0.214	0.831
27	-0.219	1.155	-0.190	0.849
28	-0.202	1.169	-0.173	0.863
29	-0.194	1.182	-0.164	0.870
30	-0.193	1.193	-0.162	0.872
31	-0.200	1.202	-0.167	0.868
32	-0.214	1.210	-0.177	0.860

Table 9 (c): *Long-run regressions of real Mining Index on M3*

k	β_k	SE_k	t_k	p-value
1	0.490	1.148	0.427	0.670
2	0.484	1.176	0.412	0.681
3	0.507	1.242	0.408	0.684
4	0.511	1.317	0.388	0.699
5	0.514	1.392	0.369	0.713
6	0.525	1.460	0.359	0.720
7	0.552	1.522	0.363	0.717
8	0.601	1.582	0.380	0.705
9	0.669	1.645	0.406	0.685
10	0.748	1.714	0.436	0.663
11	0.830	1.789	0.464	0.643
12	0.920	1.866	0.493	0.623
13	1.003	1.941	0.517	0.606
14	1.076	2.011	0.535	0.593
15	1.137	2.079	0.547	0.586
16	1.181	2.152	0.549	0.584
17	1.211	2.234	0.542	0.589
18	1.236	2.325	0.531	0.596
19	1.271	2.424	0.524	0.601
20	1.332	2.523	0.528	0.598
21	1.433	2.619	0.547	0.585
22	1.578	2.704	0.583	0.561
23	1.764	2.777	0.635	0.527
24	1.962	2.840	0.691	0.491
25	2.174	2.892	0.752	0.454
26	2.383	2.934	0.812	0.418
27	2.575	2.971	0.867	0.388
28	2.741	3.004	0.913	0.363
29	2.876	3.035	0.948	0.345
30	2.977	3.065	0.971	0.333
31	3.046	3.092	0.985	0.327
32	3.087	3.117	0.990	0.324

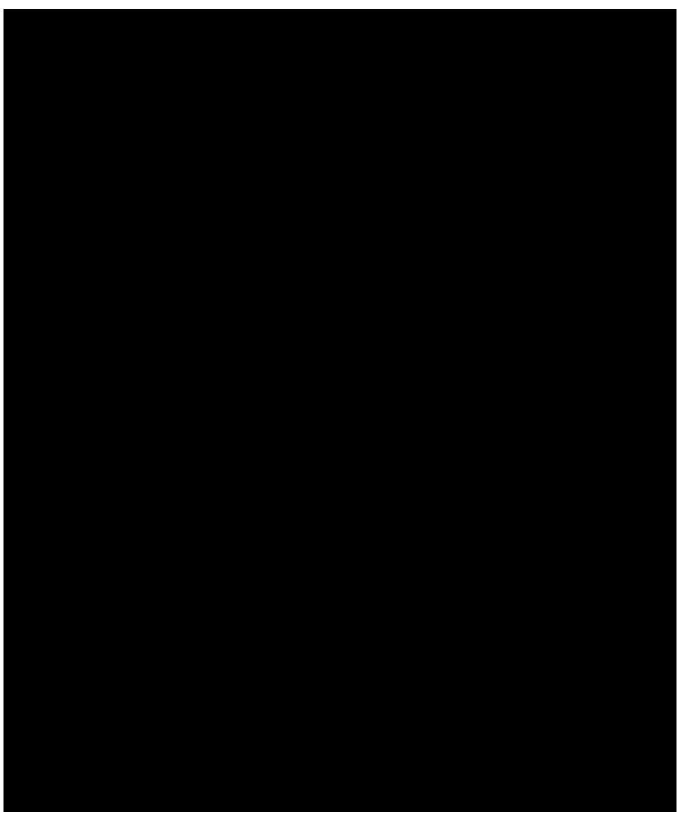

Table 10 (a): *Long-run regressions of real Plantation Index on M1*

k	β_k	SE_k	t_k	*p*-value
1	0.433	0.290	1.491	0.137
2	0.394	0.327	1.205	0.229
3	0.397	0.360	1.103	0.271
4	0.418	0.390	1.072	0.285
5	0.446	0.416	1.074	0.284
6	0.479	0.439	1.089	0.277
7	0.512	0.462	1.110	0.268
8	0.546	0.483	1.131	0.259
9	0.578	0.503	1.150	0.251
10	0.609	0.522	1.166	0.245
11	0.637	0.541	1.179	0.240
12	0.663	0.558	1.188	0.236
13	0.684	0.575	1.190	0.235
14	0.700	0.591	1.184	0.238
15	0.709	0.606	1.171	0.243
16	0.714	0.620	1.152	0.251
17	0.715	0.633	1.129	0.260
18	0.714	0.646	1.106	0.270
19	0.714	0.657	1.086	0.279
20	0.715	0.668	1.070	0.286
21	0.718	0.678	1.059	0.291
22	0.723	0.687	1.052	0.294
23	0.727	0.695	1.047	0.296
24	0.732	0.701	1.044	0.298
25	0.734	0.707	1.039	0.300
26	0.735	0.712	1.033	0.303
27	0.734	0.716	1.025	0.307
28	0.731	0.720	1.015	0.311
29	0.728	0.725	1.005	0.316
30	0.725	0.729	0.995	0.321
31	0.723	0.732	0.987	0.325
32	0.722	0.736	0.981	0.328

Table 10 (b): *Long-run regressions of real Plantation Index on M2*

k	β_k	SE_k	t_k	*p*-value
1	0.218	0.549	0.397	0.692
2	-0.009	0.641	-0.015	0.988
3	-0.188	0.703	-0.268	0.789
4	-0.309	0.742	-0.417	0.677
5	-0.379	0.769	-0.493	0.623
6	-0.413	0.789	-0.523	0.601
7	-0.421	0.803	-0.525	0.600
8	-0.412	0.816	-0.505	0.614
9	-0.387	0.828	-0.467	0.641
10	-0.350	0.840	-0.417	0.677
11	-0.306	0.853	-0.358	0.721
12	-0.256	0.868	-0.294	0.769
13	-0.207	0.883	-0.235	0.815
14	-0.164	0.897	-0.183	0.855
15	-0.130	0.911	-0.143	0.887
16	-0.106	0.925	-0.115	0.909
17	-0.090	0.939	-0.096	0.924
18	-0.078	0.954	-0.082	0.935
19	-0.066	0.970	-0.069	0.945
20	-0.051	0.986	-0.052	0.959
21	-0.029	1.003	-0.029	0.977
22	0.000	1.019	0.000	1.000
23	0.035	1.035	0.034	0.973
24	0.076	1.049	0.072	0.943
25	0.119	1.063	0.112	0.911
26	0.162	1.075	0.151	0.880
27	0.205	1.085	0.189	0.851
28	0.244	1.094	0.223	0.823
29	0.281	1.102	0.255	0.799
30	0.313	1.109	0.283	0.778
31	0.342	1.116	0.307	0.759
32	0.367	1.122	0.327	0.744

Table 10 (c): *Long-run regressions of real Plantation Index on M3*

k	β_k	SE_k	t_k	*p*-value
1	0.470	0.861	0.546	0.586
2	0.519	0.972	0.534	0.594
3	0.548	1.078	0.509	0.612
4	0.558	1.170	0.477	0.634
5	0.573	1.251	0.458	0.647
6	0.603	1.322	0.456	0.649
7	0.653	1.385	0.471	0.638
8	0.726	1.443	0.503	0.616
9	0.818	1.501	0.545	0.587
10	0.921	1.560	0.590	0.556
11	1.028	1.622	0.634	0.527
12	1.141	1.684	0.678	0.499
13	1.247	1.743	0.716	0.475
14	1.342	1.799	0.746	0.457
15	1.418	1.854	0.765	0.446
16	1.475	1.910	0.772	0.441
17	1.516	1.972	0.769	0.443
18	1.554	2.043	0.761	0.448
19	1.604	2.123	0.755	0.451
20	1.678	2.209	0.759	0.449
21	1.783	2.296	0.777	0.439
22	1.921	2.381	0.807	0.421
23	2.082	2.458	0.847	0.399
24	2.254	2.529	0.891	0.374
25	2.428	2.590	0.938	0.350
26	2.595	2.642	0.982	0.328
27	2.748	2.687	1.023	0.308
28	2.885	2.727	1.058	0.292
29	3.004	2.765	1.087	0.279
30	3.105	2.800	1.109	0.270
31	3.187	2.834	1.125	0.263
32	3.252	2.867	1.135	0.259

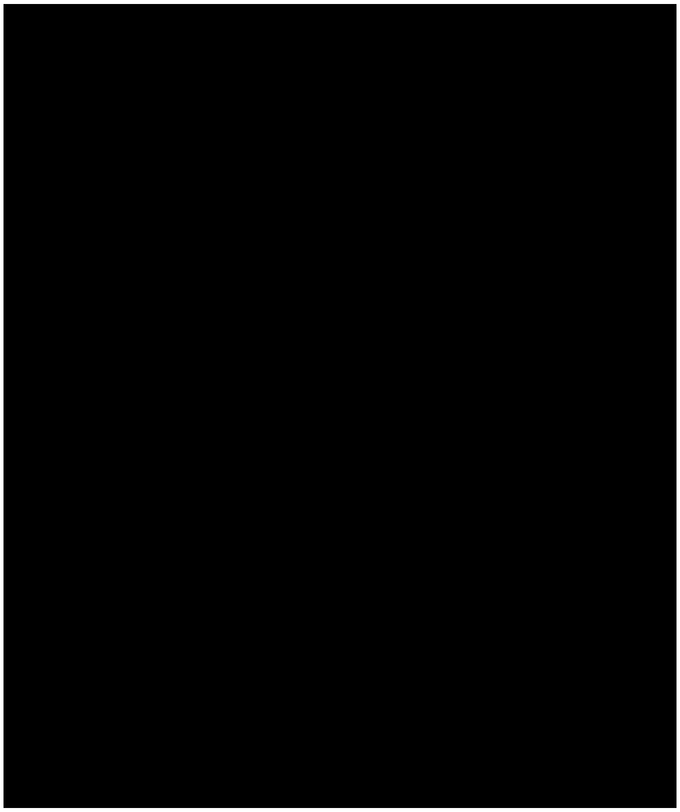

Table 11 (a): *Long-run regressions of real Property Index on M1*

k	β_k	SE_k	t_k	*p*-value
1	0.150	0.307	0.488	0.626
2	0.097	0.323	0.299	0.765
3	0.099	0.345	0.286	0.775
4	0.117	0.368	0.318	0.751
5	0.141	0.389	0.363	0.717
6	0.168	0.410	0.409	0.683
7	0.194	0.429	0.452	0.652
8	0.220	0.448	0.492	0.623
9	0.247	0.466	0.531	0.596
10	0.275	0.484	0.568	0.570
11	0.302	0.500	0.603	0.547
12	0.328	0.516	0.635	0.526
13	0.350	0.530	0.660	0.510
14	0.367	0.544	0.675	0.500
15	0.378	0.556	0.681	0.497
16	0.385	0.567	0.679	0.498
17	0.389	0.578	0.673	0.502
18	0.392	0.589	0.666	0.506
19	0.396	0.598	0.661	0.509
20	0.402	0.607	0.662	0.509
21	0.410	0.615	0.667	0.506
22	0.419	0.622	0.675	0.501
23	0.429	0.627	0.683	0.495
24	0.437	0.632	0.690	0.491
25	0.442	0.637	0.694	0.488
26	0.444	0.640	0.694	0.488
27	0.445	0.644	0.690	0.491
28	0.443	0.647	0.685	0.494
29	0.441	0.651	0.678	0.498
30	0.440	0.654	0.673	0.502
31	0.440	0.657	0.670	0.504
32	0.442	0.659	0.670	0.504

Table 11 (b): *Long-run regressions of real Property Index on M2*

k	β_k	SE_k	t_k	*p*-value
1	0.554	0.473	1.171	0.243
2	0.396	0.527	0.752	0.453
3	0.276	0.575	0.480	0.632
4	0.191	0.614	0.312	0.756
5	0.131	0.644	0.203	0.839
6	0.086	0.670	0.129	0.898
7	0.054	0.693	0.078	0.938
8	0.036	0.714	0.051	0.960
9	0.033	0.735	0.045	0.965
10	0.044	0.757	0.058	0.954
11	0.066	0.779	0.085	0.933
12	0.099	0.801	0.123	0.902
13	0.131	0.824	0.159	0.874
14	0.157	0.845	0.185	0.853
15	0.171	0.866	0.197	0.844
16	0.173	0.885	0.195	0.845
17	0.165	0.904	0.182	0.856
18	0.152	0.922	0.164	0.870
19	0.140	0.941	0.149	0.882
20	0.135	0.961	0.140	0.889
21	0.139	0.980	0.141	0.888
22	0.153	0.999	0.153	0.879
23	0.175	1.018	0.172	0.864
24	0.204	1.035	0.197	0.844
25	0.235	1.051	0.224	0.823
26	0.266	1.067	0.250	0.803
27	0.295	1.081	0.273	0.785
28	0.319	1.094	0.292	0.771
29	0.339	1.106	0.307	0.759
30	0.355	1.117	0.318	0.751
31	0.367	1.127	0.326	0.745
32	0.376	1.137	0.331	0.741

Table 11 (c): *Long-run regressions of real Property Index on M3*

k	β_k	SE_k	t_k	*p*-value
1	1.059	0.877	1.207	0.229
2	1.088	0.931	1.169	0.244
3	1.164	0.987	1.179	0.240
4	1.236	1.045	1.183	0.239
5	1.305	1.102	1.184	0.238
6	1.374	1.153	1.192	0.235
7	1.453	1.198	1.212	0.228
8	1.543	1.240	1.244	0.215
9	1.644	1.283	1.282	0.202
10	1.754	1.329	1.320	0.189
11	1.873	1.379	1.359	0.176
12	2.018	1.427	1.414	0.159
13	2.168	1.472	1.473	0.143
14	2.309	1.514	1.526	0.129
15	2.425	1.553	1.561	0.121
16	2.507	1.598	1.569	0.119
17	2.560	1.650	1.551	0.123
18	2.599	1.712	1.518	0.131
19	2.648	1.780	1.488	0.139
20	2.726	1.846	1.477	0.142
21	2.846	1.906	1.493	0.138
22	3.009	1.956	1.538	0.126
23	3.206	1.998	1.605	0.111
24	3.409	2.036	1.674	0.097
25	3.614	2.069	1.747	0.083
26	3.809	2.099	1.815	0.072
27	3.986	2.126	1.875	0.063
28	4.141	2.151	1.925	0.057
29	4.272	2.175	1.964	0.052
30	4.381	2.199	1.993	0.049
31	4.471	2.222	2.012	0.046
32	4.543	2.244	2.025	0.045

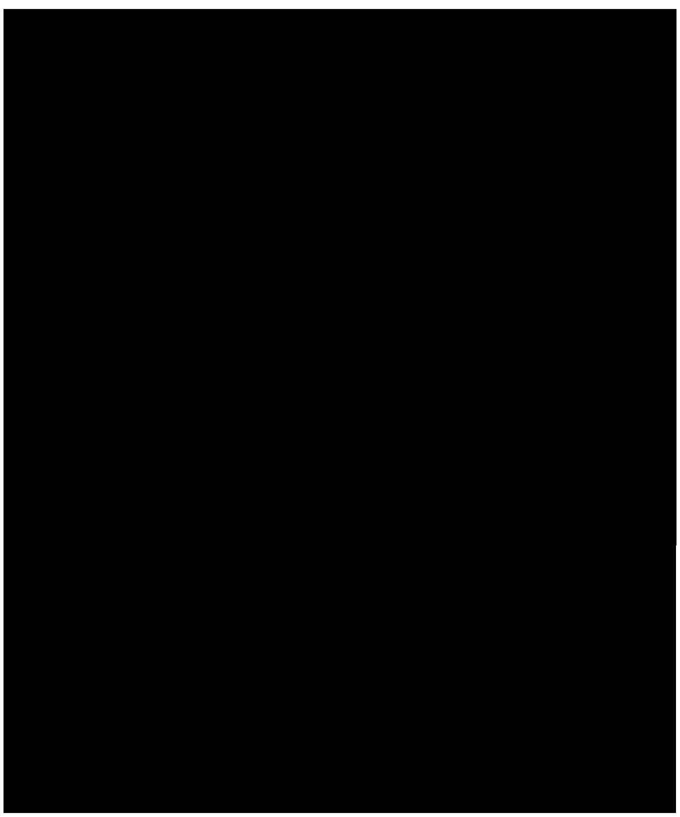

Table 12 (a): *Long-run regressions of real Second Board Index on M1*

k	β_k	SE_k	t_k	p-value
1	0.333	0.569	0.586	0.560
2	0.222	0.596	0.372	0.711
3	0.231	0.623	0.371	0.711
4	0.267	0.648	0.412	0.681
5	0.306	0.668	0.458	0.648
6	0.346	0.685	0.506	0.614
7	0.388	0.658	0.590	0.557
8	0.434	0.668	0.650	0.518
9	0.485	0.676	0.717	0.476
10	0.541	0.682	0.793	0.430
11	0.606	0.688	0.881	0.381
12	0.676	0.693	0.977	0.332
13	0.748	0.696	1.075	0.286
14	0.815	0.698	1.168	0.246
15	0.873	0.699	1.249	0.216
16	0.920	0.701	1.313	0.193
17	0.957	0.702	1.362	0.177
18	0.986	0.704	1.401	0.165
19	1.015	0.706	1.438	0.155
20	1.047	0.707	1.481	0.143
21	1.084	0.707	1.533	0.130
22	1.125	0.706	1.593	0.116
23	1.154	0.703	1.642	0.105
24	1.182	0.699	1.692	0.095
25	1.205	0.693	1.739	0.087
26	1.223	0.686	1.782	0.079
27	1.235	0.679	1.820	0.073
28	1.243	0.671	1.852	0.069
29	1.249	0.664	1.882	0.064
30	1.256	0.658	1.909	0.061

Table 12 (b): *Long-run regressions of real Second Board Index on M2*

k	β_k	SE_k	t_k	p-value
1	-0.404	1.193	-0.339	0.736
2	-0.578	1.269	-0.456	0.650
3	-0.604	1.370	-0.441	0.660
4	-0.605	1.475	-0.410	0.683
5	-0.601	1.571	-0.383	0.703
6	-0.594	1.657	-0.359	0.721
7	-0.571	1.701	-0.336	0.738
8	-0.518	1.768	-0.293	0.770
9	-0.422	1.829	-0.231	0.818
10	-0.273	1.883	-0.145	0.885
11	-0.039	1.928	-0.020	0.984
12	0.257	1.969	0.130	0.897
13	0.598	2.016	0.297	0.768
14	0.954	2.078	0.459	0.647
15	1.292	2.158	0.599	0.551
16	1.584	2.249	0.704	0.483
17	1.822	2.343	0.778	0.439
18	2.012	2.431	0.828	0.410
19	2.170	2.511	0.864	0.390
20	2.312	2.584	0.895	0.374
21	2.444	2.648	0.923	0.359
22	2.565	2.705	0.948	0.346
23	2.652	2.747	0.966	0.338
24	2.707	2.771	0.977	0.332
25	2.718	2.773	0.980	0.331
26	2.683	2.748	0.977	0.332
27	2.607	2.698	0.966	0.337
28	2.501	2.631	0.950	0.345
29	2.377	2.558	0.929	0.356
30	2.253	2.490	0.905	0.369

Table 12 (c): *Long-run regressions of real Second Board Index on M3*

k	β_k	SE_k	t_k	p-value
1	-0.067	1.085	-0.061	0.951
2	-0.407	1.195	-0.341	0.734
3	-0.506	1.333	-0.380	0.705
4	-0.597	1.455	-0.410	0.683
5	-0.684	1.567	-0.436	0.664
6	-0.755	1.670	-0.452	0.652
7	-0.798	1.809	-0.441	0.660
8	-0.801	1.898	-0.422	0.674
9	-0.757	1.987	-0.381	0.704
10	-0.666	2.075	-0.321	0.749
11	-0.493	2.169	-0.227	0.821
12	-0.288	2.267	-0.127	0.899
13	-0.078	2.365	-0.033	0.974
14	0.100	2.454	0.041	0.968
15	0.214	2.522	0.085	0.933
16	0.249	2.570	0.097	0.923
17	0.219	2.610	0.084	0.934
18	0.155	2.665	0.058	0.954
19	0.108	2.747	0.039	0.969
20	0.126	2.853	0.044	0.965
21	0.246	2.964	0.083	0.934
22	0.485	3.063	0.158	0.875
23	0.875	3.157	0.277	0.783
24	1.347	3.245	0.415	0.679
25	1.853	3.339	0.555	0.581
26	2.339	3.441	0.680	0.499
27	2.760	3.538	0.780	0.438
28	3.086	3.612	0.854	0.396
29	3.309	3.653	0.906	0.368
30	3.440	3.666	0.938	0.352

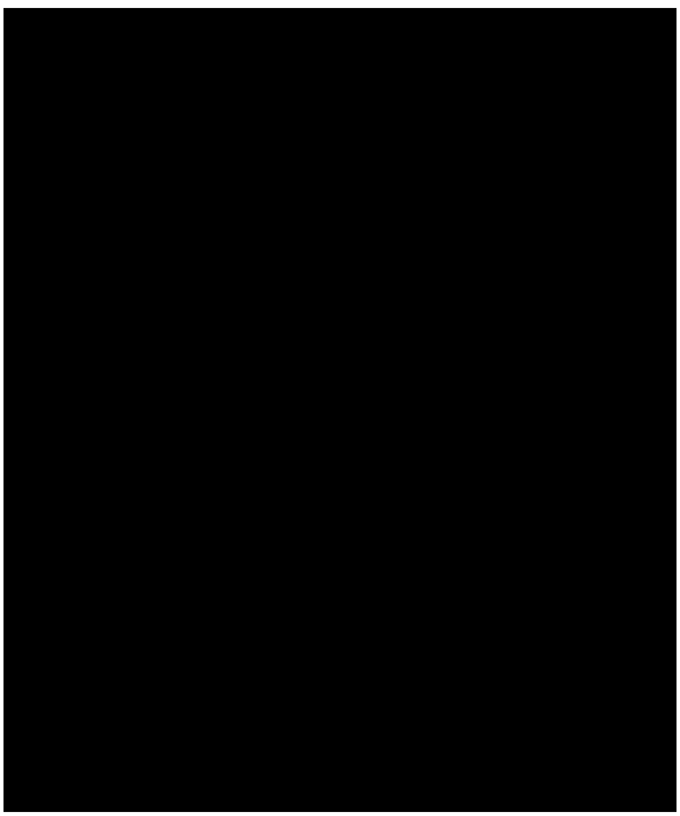

Table 13 (a): *Long-run regressions of real Trading Index on M1*

k	β_k	SE_k	t_k	*p*-value
1	0.419	0.404	1.037	0.304
2	0.311	0.455	0.684	0.497
3	0.265	0.504	0.526	0.601
4	0.239	0.548	0.435	0.665
5	0.227	0.585	0.389	0.699
6	0.232	0.615	0.377	0.708
7	0.252	0.639	0.394	0.695
8	0.285	0.658	0.433	0.667
9	0.327	0.674	0.485	0.630
10	0.371	0.689	0.539	0.592
11	0.414	0.704	0.588	0.559
12	0.451	0.720	0.627	0.534
13	0.483	0.739	0.652	0.517
14	0.504	0.762	0.662	0.511
15	0.514	0.786	0.654	0.516
16	0.470	0.785	0.598	0.553
17	0.404	0.778	0.519	0.606
18	0.317	0.761	0.417	0.679
19	0.217	0.736	0.296	0.769
20	0.114	0.707	0.161	0.873
21	0.016	0.680	0.023	0.982

Table 13 (b): *Long-run regressions of real Trading Index on M2*

k	β_k	SE_k	t_k	*p*-value
1	-0.199	0.937	-0.212	0.833
2	-0.503	1.179	-0.427	0.671
3	-0.791	1.398	-0.566	0.574
4	-1.039	1.575	-0.660	0.512
5	-1.178	1.725	-0.683	0.498
6	-1.195	1.854	-0.644	0.522
7	-1.090	1.965	-0.555	0.581
8	-0.861	2.069	-0.416	0.679
9	-0.509	2.183	-0.233	0.816
10	-0.038	2.310	-0.017	0.987
11	0.536	2.434	0.220	0.827
12	1.165	2.527	0.461	0.647
13	1.763	2.580	0.683	0.498
14	2.237	2.610	0.857	0.396
15	2.528	2.641	0.957	0.343
16	2.624	2.650	0.990	0.327
17	2.569	2.669	0.963	0.341
18	2.418	2.691	0.899	0.374
19	2.231	2.700	0.826	0.413
20	2.064	2.683	0.769	0.446
21	1.955	2.634	0.742	0.462

Table 13 (c): *Long-run regressions of real Trading Index on M3*

k	β_k	SE_k	t_k	*p*-value
1	1.025	1.247	0.822	0.414
2	0.825	1.491	0.553	0.582
3	0.753	1.722	0.438	0.663
4	0.623	1.915	0.325	0.746
5	0.533	2.072	0.257	0.798
6	0.553	2.187	0.253	0.801
7	0.712	2.251	0.316	0.753
8	1.015	2.278	0.445	0.658
9	1.440	2.302	0.625	0.534
10	1.944	2.358	0.824	0.413
11	2.460	2.463	0.999	0.323
12	2.902	2.598	1.117	0.269
13	3.189	2.722	1.171	0.247
14	3.279	2.803	1.170	0.248
15	3.176	2.838	1.119	0.269
16	2.793	2.792	1.000	0.322
17	2.273	2.736	0.831	0.411
18	1.660	2.688	0.618	0.540
19	1.011	2.672	0.379	0.707
20	0.397	2.721	0.146	0.885
21	-0.103	2.857	-0.036	0.971

Figure 12 (a): Real Trading Index on Money, M1: 1993:9-1999:12

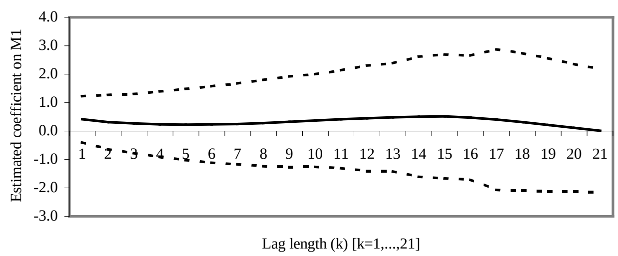

Figure 12 (b): Real Trading Index on Money, M2: 1993:9-1999:12

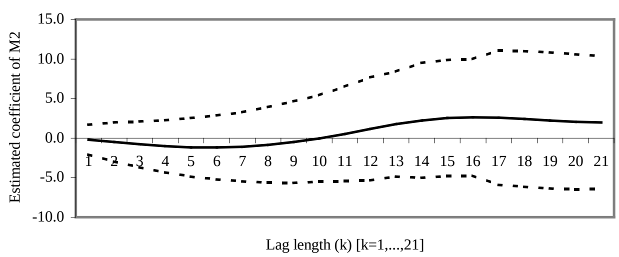

Figure 12 (c): Real Trading Index on Money, M3: 1993:9-1999:12