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

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Testing Long-Run Neutrality of Money:
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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:

$$a(L)\Delta^{\langle m \rangle} m_t = b(L)\Delta^{\langle y \rangle} y_t + u_t$$
$$d(L)\Delta^{\langle y \rangle} y_t = c(L)\Delta^{\langle m \rangle} m_t + w_t$$

(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

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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 Σ. LRN can be defined in terms of the long-run derivative (*LRD*) of $\Delta^{\langle y \rangle} y_t$ with respect to a permanent change in $\Delta^{\langle m \rangle} m_t$.

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

where $\lim_{k \to \infty} \partial(\Delta^{\langle m \rangle} m_{t+k})/\partial u_t \neq 0$. $LRD_{y,m}$ 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 $\lim_{k \to \infty} \partial(\Delta^{\langle m \rangle} m_{t+k})/\partial u_t = 0$, 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:

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

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:

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

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

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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*					Table 2 (b): *Long-run regressions of real Composite Index on M2*					Table 2 (c): *Long-run regressions of real Composite Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.170	0.237	0.718	0.474	1	0.278	0.338	0.823	0.411	1	0.810	0.792	1.022	0.308
2	0.120	0.251	0.479	0.632	2	0.131	0.380	0.344	0.731	2	0.938	0.816	1.149	0.252
3	0.101	0.266	0.377	0.706	3	-0.004	0.417	-0.009	0.993	3	1.041	0.840	1.240	0.217
4	0.092	0.282	0.328	0.743	4	-0.108	0.447	-0.242	0.809	4	1.116	0.869	1.285	0.201
5	0.091	0.295	0.309	0.758	5	-0.183	0.470	-0.388	0.698	5	1.183	0.900	1.314	0.191
6	0.095	0.309	0.307	0.759	6	-0.235	0.490	-0.479	0.632	6	1.251	0.929	1.346	0.180
7	0.101	0.321	0.315	0.753	7	-0.271	0.508	-0.532	0.595	7	1.327	0.953	1.392	0.166
8	0.110	0.333	0.329	0.742	8	-0.292	0.525	-0.555	0.579	8	1.414	0.974	1.452	0.149
9	0.119	0.344	0.347	0.729	9	-0.299	0.541	-0.553	0.581	9	1.510	0.995	1.517	0.132
10	0.130	0.355	0.366	0.715	10	-0.297	0.558	-0.531	0.596	10	1.608	1.020	1.577	0.117
11	0.141	0.366	0.386	0.700	11	-0.286	0.576	-0.496	0.621	11	1.707	1.048	1.628	0.106
12	0.152	0.376	0.405	0.686	12	-0.267	0.594	-0.450	0.653	12	1.815	1.078	1.684	0.094
13	0.162	0.385	0.420	0.675	13	-0.248	0.613	-0.405	0.686	13	1.922	1.107	1.735	0.085
14	0.169	0.394	0.428	0.669	14	-0.233	0.630	-0.369	0.712	14	2.018	1.135	1.779	0.078
15	0.172	0.402	0.428	0.669	15	-0.224	0.647	-0.346	0.730	15	2.094	1.160	1.805	0.073
16	0.173	0.410	0.422	0.674	16	-0.223	0.662	-0.337	0.737	16	2.142	1.187	1.804	0.073
17	0.171	0.417	0.411	0.682	17	-0.230	0.676	-0.340	0.734	17	2.162	1.218	1.775	0.078
18	0.169	0.424	0.400	0.690	18	-0.241	0.690	-0.349	0.727	18	2.166	1.256	1.725	0.087
19	0.168	0.431	0.391	0.696	19	-0.253	0.704	-0.359	0.720	19	2.167	1.299	1.668	0.098
20	0.169	0.436	0.387	0.699	20	-0.261	0.719	-0.364	0.716	20	2.180	1.346	1.619	0.108
21	0.171	0.442	0.387	0.699	21	-0.265	0.733	-0.361	0.719	21	2.215	1.393	1.589	0.114
22	0.175	0.446	0.392	0.696	22	-0.261	0.747	-0.349	0.727	22	2.276	1.438	1.583	0.116
23	0.179	0.451	0.398	0.691	23	-0.251	0.761	-0.330	0.742	23	2.364	1.477	1.601	0.112
24	0.184	0.454	0.404	0.686	24	-0.236	0.773	-0.305	0.761	24	2.461	1.513	1.627	0.106
25	0.187	0.457	0.408	0.684	25	-0.217	0.785	-0.277	0.782	25	2.572	1.542	1.667	0.098
26	0.188	0.460	0.409	0.683	26	-0.198	0.795	-0.249	0.804	26	2.688	1.568	1.715	0.089
27	0.188	0.462	0.407	0.685	27	-0.179	0.805	-0.223	0.824	27	2.802	1.590	1.763	0.080
28	0.187	0.465	0.402	0.688	28	-0.163	0.813	-0.200	0.842	28	2.908	1.610	1.806	0.073
29	0.185	0.467	0.396	0.693	29	-0.149	0.821	-0.181	0.856	29	3.000	1.630	1.841	0.068
30	0.183	0.469	0.390	0.697	30	-0.139	0.828	-0.167	0.867	30	3.074	1.648	1.865	0.065
31	0.182	0.471	0.386	0.700	31	-0.131	0.834	-0.157	0.875	31	3.128	1.665	1.879	0.063
32	0.182	0.472	0.385	0.701	32	-0.127	0.840	-0.151	0.880	32	3.164	1.681	1.882	0.062
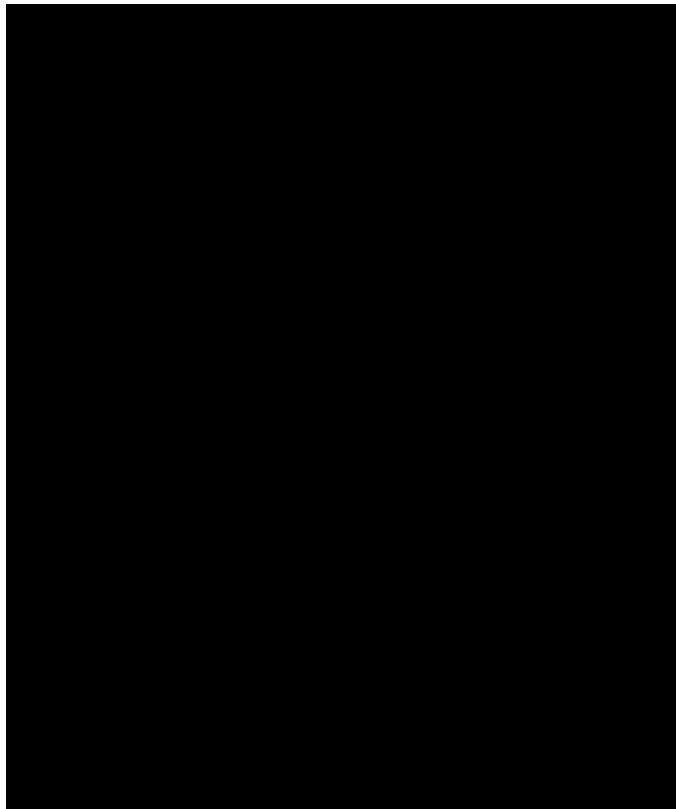
Table 3 (a): *Long-run regressions of real Construction Index on M1*					Table 3 (b): *Long-run regressions of real Construction Index on M2*					Table 3 (c): *Long-run regressions of real Construction Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.122	0.716	0.170	0.865	1	-1.330	1.402	-0.948	0.347	1	0.038	1.956	0.020	0.984
2	0.068	0.766	0.089	0.929	2	-1.490	1.816	-0.821	0.415	2	0.047	2.493	0.019	0.985
3	0.071	0.816	0.087	0.931	3	-1.706	2.175	-0.784	0.436	3	0.106	2.919	0.036	0.971
4	0.088	0.860	0.102	0.919	4	-1.889	2.463	-0.767	0.446	4	0.053	3.280	0.016	0.987
5	0.123	0.894	0.137	0.892	5	-1.926	2.711	-0.710	0.480	5	0.050	3.580	0.014	0.989
6	0.176	0.917	0.192	0.849	6	-1.810	2.926	-0.618	0.539	6	0.185	3.807	0.049	0.961
7	0.245	0.930	0.263	0.793	7	-1.549	3.119	-0.497	0.621	7	0.490	3.956	0.124	0.902
8	0.326	0.937	0.348	0.729	8	-1.139	3.309	-0.344	0.732	8	0.965	4.055	0.238	0.813
9	0.416	0.938	0.443	0.660	9	-0.569	3.516	-0.162	0.872	9	1.587	4.154	0.382	0.704
10	0.507	0.938	0.541	0.591	10	0.173	3.745	0.046	0.963	10	2.309	4.298	0.537	0.594
11	0.598	0.941	0.636	0.528	11	1.077	3.966	0.272	0.787	11	3.048	4.499	0.677	0.501
12	0.685	0.949	0.722	0.474	12	2.077	4.137	0.502	0.618	12	3.688	4.722	0.781	0.438
13	0.767	0.964	0.795	0.430	13	3.045	4.255	0.716	0.478	13	4.121	4.912	0.839	0.406
14	0.842	0.988	0.852	0.399	14	3.846	4.355	0.883	0.382	14	4.292	5.036	0.852	0.398
15	0.905	1.019	0.888	0.379	15	4.402	4.480	0.982	0.331	15	4.221	5.114	0.825	0.413
16	0.899	1.023	0.879	0.384	16	4.672	4.599	1.016	0.315	16	3.830	5.172	0.741	0.463
17	0.871	1.024	0.850	0.400	17	4.758	4.750	1.002	0.322	17	3.331	5.286	0.630	0.532
18	0.823	1.021	0.806	0.425	18	4.739	4.908	0.966	0.340	18	2.824	5.482	0.515	0.609
19	0.764	1.016	0.752	0.456	19	4.695	5.037	0.932	0.357	19	2.422	5.762	0.420	0.676
20	0.705	1.012	0.696	0.490	20	4.678	5.118	0.914	0.366	20	2.247	6.111	0.368	0.715
21	0.654	1.015	0.644	0.523	21	4.707	5.153	0.913	0.366	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
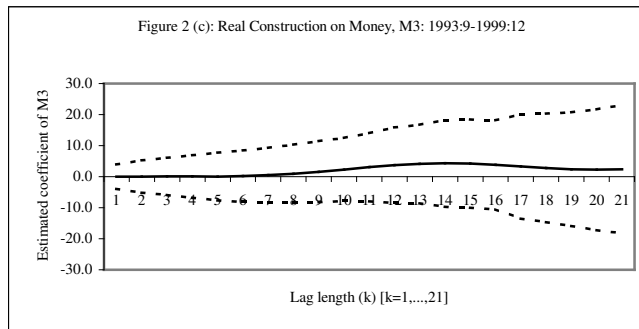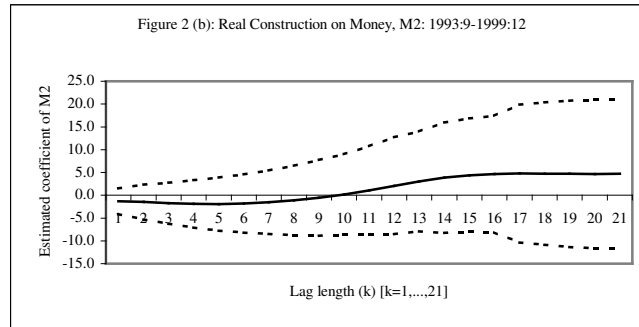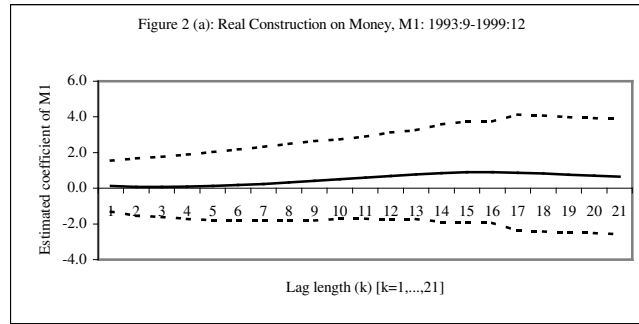
	Table 4 (a): *Long-run regressions of real Consumer Index on M1*					Table 4 (b): *Long-run regressions of real Consumer Index on M2*					Table 4 (c): *Long-run regressions of real Consumer Index on M3*			
k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value
1	0.180	0.486	0.370	0.712		1	-0.830	1.077	-0.771	0.444		1	-0.091	1.475	-0.062	0.951
2	0.122	0.523	0.233	0.817		2	-1.148	1.228	-0.935	0.354		2	-0.448	1.655	-0.271	0.787
3	0.113	0.559	0.203	0.840		3	-1.497	1.338	-1.119	0.268		3	-0.759	1.774	-0.428	0.670
4	0.103	0.585	0.176	0.861		4	-1.830	1.412	-1.296	0.200		4	-1.185	1.824	-0.650	0.519
5	0.090	0.606	0.149	0.882		5	-2.053	1.512	-1.358	0.180		5	-1.550	1.880	-0.825	0.413
6	0.085	0.625	0.135	0.893		6	-2.134	1.628	-1.311	0.195		6	-1.757	1.935	-0.908	0.368
7	0.092	0.640	0.143	0.887		7	-2.062	1.739	-1.186	0.241		7	-1.774	1.969	-0.901	0.372
8	0.110	0.652	0.169	0.866		8	-1.835	1.846	-0.994	0.325		8	-1.601	1.986	-0.806	0.424
9	0.136	0.663	0.205	0.838		9	-1.470	1.967	-0.747	0.458		9	-1.281	2.020	-0.634	0.529
10	0.162	0.673	0.240	0.811		10	-0.994	2.117	-0.470	0.641		10	-0.881	2.105	-0.418	0.677
11	0.183	0.684	0.267	0.790		11	-0.449	2.289	-0.196	0.845		11	-0.484	2.246	-0.215	0.830
12	0.197	0.698	0.283	0.778		12	0.110	2.458	0.045	0.964		12	-0.172	2.405	-0.072	0.943
13	0.204	0.715	0.286	0.776		13	0.607	2.600	0.234	0.816		13	-0.010	2.536	-0.004	0.997
14	0.202	0.734	0.275	0.784		14	0.974	2.712	0.359	0.721		14	-0.026	2.611	-0.010	0.992
15	0.189	0.755	0.250	0.803		15	1.177	2.809	0.419	0.677		15	-0.213	2.635	-0.081	0.936
16	0.141	0.756	0.187	0.853		16	1.248	2.876	0.434	0.666		16	-0.646	2.588	-0.250	0.804
17	0.079	0.755	0.105	0.917		17	1.213	2.949	0.411	0.683		17	-1.202	2.537	-0.474	0.638
18	0.007	0.749	0.010	0.992		18	1.121	3.024	0.371	0.713		18	-1.841	2.510	-0.734	0.467
19	-0.069	0.741	-0.093	0.926		19	1.022	3.085	0.331	0.742		19	-2.508	2.539	-0.988	0.329
20	-0.143	0.731	-0.195	0.846		20	0.953	3.120	0.306	0.762		20	-3.136	2.650	-1.183	0.243
21	-0.208	0.723	-0.288	0.775		21	0.933	3.121	0.299	0.767		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
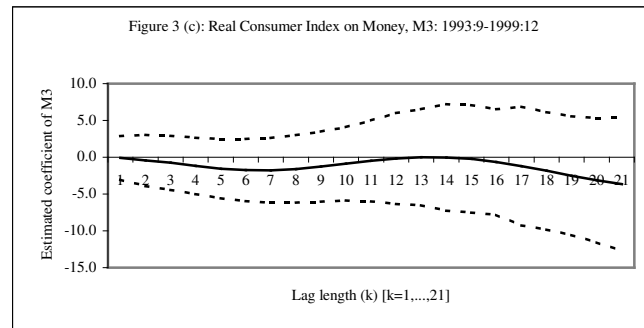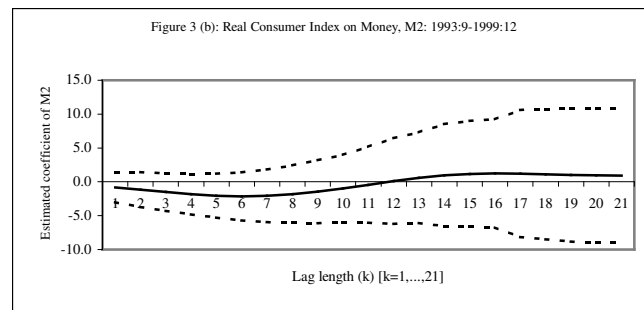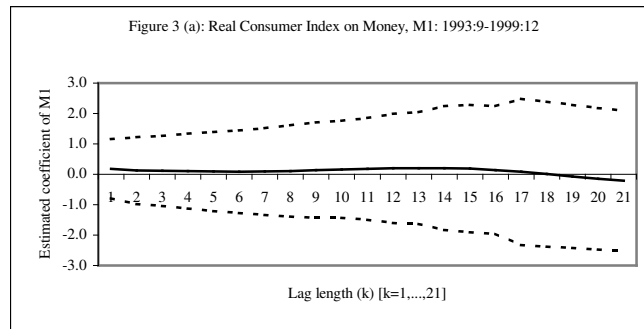
	Table 5 (a): *Long-run regressions of real Emas Index on M1*					Table 5 (b): *Long-run regressions of real Emas Index on M2*					Table 5 (c): *Long-run regressions of real Emas Index on M3*			
k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value
1	0.085	0.282	0.303	0.763		1	0.441	0.495	0.891	0.374		1	0.836	0.732	1.142	0.255
2	0.025	0.304	0.081	0.935		2	0.380	0.565	0.671	0.503		2	0.921	0.782	1.178	0.241
3	0.015	0.328	0.047	0.963		3	0.317	0.628	0.505	0.615		3	1.008	0.832	1.212	0.227
4	0.026	0.351	0.075	0.940		4	0.275	0.682	0.402	0.688		4	1.076	0.881	1.222	0.224
5	0.046	0.373	0.124	0.902		5	0.254	0.731	0.347	0.729		5	1.140	0.928	1.228	0.221
6	0.070	0.394	0.178	0.859		6	0.253	0.778	0.325	0.745		6	1.205	0.969	1.243	0.216
7	0.098	0.414	0.236	0.814		7	0.277	0.823	0.336	0.737		7	1.280	1.004	1.274	0.205
8	0.129	0.433	0.298	0.766		8	0.327	0.866	0.377	0.706		8	1.368	1.035	1.322	0.188
9	0.162	0.450	0.361	0.719		9	0.402	0.907	0.443	0.659		9	1.467	1.065	1.377	0.171
10	0.197	0.466	0.423	0.673		10	0.495	0.945	0.524	0.601		10	1.573	1.099	1.431	0.155
11	0.232	0.479	0.485	0.629		11	0.601	0.982	0.612	0.541		11	1.682	1.137	1.479	0.141
12	0.266	0.491	0.541	0.589		12	0.701	1.015	0.691	0.491		12	1.801	1.177	1.530	0.128
13	0.298	0.502	0.594	0.553		13	0.798	1.046	0.763	0.447		13	1.917	1.217	1.576	0.117
14	0.329	0.512	0.642	0.522		14	0.885	1.076	0.823	0.412		14	2.019	1.253	1.612	0.109
15	0.356	0.521	0.682	0.496		15	0.957	1.106	0.865	0.388		15	2.098	1.287	1.631	0.105
16	0.379	0.530	0.715	0.476		16	1.012	1.137	0.890	0.375		16	2.148	1.322	1.625	0.106
17	0.397	0.537	0.740	0.461		17	1.050	1.169	0.898	0.370		17	2.173	1.362	1.595	0.113
18	0.413	0.543	0.760	0.448		18	1.075	1.200	0.895	0.372		18	2.185	1.410	1.550	0.124
19	0.428	0.549	0.779	0.437		19	1.091	1.230	0.887	0.376		19	2.203	1.465	1.504	0.135
20	0.444	0.555	0.800	0.425		20	1.105	1.258	0.878	0.381		20	2.243	1.522	1.474	0.143
21	0.463	0.561	0.825	0.410		21	1.121	1.284	0.874	0.384		21	2.313	1.576	1.468	0.145
22	0.486	0.568	0.856	0.393		22	1.141	1.306	0.874	0.383		22	2.417	1.625	1.487	0.139
23	0.513	0.575	0.893	0.374		23	1.165	1.324	0.880	0.380		23	2.549	1.666	1.530	0.129
24	0.545	0.582	0.936	0.351		24	1.189	1.339	0.888	0.376		24	2.690	1.704	1.579	0.117
25	0.578	0.590	0.980	0.329		25	1.214	1.351	0.899	0.370		25	2.839	1.735	1.636	0.104
26	0.610	0.597	1.023	0.308		26	1.235	1.360	0.908	0.365		26	2.985	1.762	1.694	0.093
27	0.641	0.603	1.063	0.290		27	1.252	1.367	0.916	0.361		27	3.122	1.786	1.748	0.083
28	0.670	0.610	1.099	0.273		28	1.264	1.373	0.921	0.359		28	3.244	1.809	1.794	0.075
29	0.696	0.615	1.133	0.259		29	1.271	1.378	0.923	0.358		29	3.348	1.830	1.829	0.070
30	0.721	0.619	1.164	0.246		30	1.274	1.382	0.922	0.358		30	3.433	1.850	1.855	0.066
31	0.744	0.623	1.194	0.234		31	1.273	1.385	0.919	0.360		31	3.499	1.870	1.871	0.064
32	0.765	0.625	1.225	0.223		32	1.269	1.389	0.913	0.363		32	3.549	1.889	1.879	0.063

Table 6 (a): *Long-run regressions of real Finance Index on M1*					Table 6 (b): *Long-run regressions of real Finance Index on M2*					Table 6 (c): *Long-run regressions of real Finance Index on M3*				
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.173	0.310	0.558	0.577	1	0.418	0.428	0.976	0.330	1	1.147	0.900	1.275	0.204
2	0.140	0.316	0.442	0.659	2	0.341	0.507	0.673	0.502	2	1.391	0.995	1.397	0.164
3	0.142	0.328	0.432	0.666	3	0.263	0.561	0.469	0.640	3	1.589	1.068	1.488	0.139
4	0.156	0.342	0.457	0.648	4	0.204	0.600	0.340	0.735	4	1.733	1.130	1.533	0.127
5	0.176	0.355	0.496	0.620	5	0.164	0.628	0.262	0.794	5	1.849	1.185	1.561	0.121
6	0.197	0.367	0.537	0.592	6	0.139	0.650	0.214	0.831	6	1.952	1.231	1.586	0.115
7	0.218	0.380	0.575	0.566	7	0.124	0.668	0.186	0.853	7	2.055	1.270	1.618	0.108
8	0.240	0.392	0.612	0.541	8	0.121	0.685	0.177	0.860	8	2.164	1.305	1.659	0.099
9	0.262	0.404	0.649	0.517	9	0.131	0.700	0.186	0.852	9	2.281	1.338	1.705	0.090
10	0.284	0.415	0.685	0.494	10	0.152	0.715	0.213	0.831	10	2.406	1.371	1.754	0.082
11	0.307	0.425	0.721	0.472	11	0.185	0.730	0.253	0.800	11	2.539	1.406	1.805	0.073
12	0.329	0.435	0.756	0.450	12	0.228	0.744	0.306	0.760	12	2.688	1.441	1.865	0.064
13	0.348	0.444	0.784	0.434	13	0.271	0.759	0.357	0.722	13	2.835	1.476	1.921	0.057
14	0.364	0.452	0.804	0.422	14	0.307	0.775	0.397	0.692	14	2.966	1.507	1.968	0.051
15	0.374	0.460	0.813	0.417	15	0.332	0.790	0.421	0.674	15	3.066	1.537	1.995	0.048
16	0.380	0.468	0.813	0.417	16	0.344	0.804	0.428	0.669	16	3.130	1.569	1.995	0.048
17	0.383	0.475	0.808	0.420	17	0.345	0.819	0.422	0.673	17	3.166	1.609	1.968	0.051
18	0.385	0.482	0.800	0.425	18	0.341	0.833	0.409	0.683	18	3.193	1.658	1.926	0.056
19	0.388	0.488	0.794	0.428	19	0.336	0.848	0.396	0.692	19	3.234	1.712	1.889	0.061
20	0.391	0.494	0.792	0.429	20	0.336	0.864	0.389	0.697	20	3.309	1.766	1.874	0.063
21	0.397	0.499	0.795	0.427	21	0.345	0.879	0.392	0.696	21	3.427	1.812	1.891	0.061
22	0.403	0.504	0.801	0.424	22	0.361	0.894	0.404	0.687	22	3.587	1.850	1.939	0.055
23	0.409	0.507	0.807	0.421	23	0.384	0.909	0.423	0.673	23	3.779	1.878	2.012	0.046
24	0.414	0.510	0.811	0.418	24	0.412	0.922	0.447	0.655	24	3.978	1.905	2.088	0.039
25	0.416	0.513	0.811	0.418	25	0.442	0.934	0.473	0.637	25	4.177	1.928	2.166	0.032
26	0.416	0.515	0.807	0.421	26	0.470	0.945	0.498	0.619	26	4.365	1.949	2.240	0.027
27	0.413	0.517	0.799	0.425	27	0.496	0.955	0.519	0.604	27	4.535	1.968	2.304	0.023
28	0.410	0.519	0.789	0.431	28	0.517	0.964	0.537	0.592	28	4.683	1.987	2.356	0.020
29	0.406	0.521	0.779	0.437	29	0.535	0.972	0.550	0.583	29	4.807	2.006	2.396	0.018
30	0.402	0.523	0.769	0.443	30	0.548	0.980	0.559	0.577	30	4.909	2.026	2.424	0.017
31	0.400	0.525	0.762	0.447	31	0.558	0.987	0.565	0.573	31	4.991	2.045	2.440	0.016
32	0.399	0.527	0.757	0.450	32	0.565	0.994	0.568	0.570	32	5.054	2.064	2.448	0.016

	Table 7 (a): *Long-run regressions of real Industrial Index on M1*					Table 7 (b): *Long-run regressions of real Industrial Index on M2*					Table 7 (c): *Long-run regressions of real Industrial Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.191	0.219	0.869	0.386	1	0.257	0.325	0.792	0.429	1	0.505	0.725	0.697	0.487
2	0.148	0.237	0.624	0.533	2	0.101	0.365	0.277	0.782	2	0.563	0.753	0.748	0.456
3	0.133	0.255	0.522	0.602	3	-0.040	0.400	-0.100	0.920	3	0.610	0.783	0.780	0.437
4	0.129	0.272	0.473	0.637	4	-0.150	0.429	-0.349	0.727	4	0.633	0.816	0.776	0.439
5	0.131	0.287	0.457	0.648	5	-0.228	0.453	-0.504	0.615	5	0.653	0.850	0.768	0.444
6	0.139	0.301	0.462	0.645	6	-0.283	0.473	-0.599	0.550	6	0.678	0.883	0.769	0.443
7	0.150	0.314	0.477	0.634	7	-0.320	0.489	-0.654	0.514	7	0.715	0.910	0.785	0.434
8	0.163	0.327	0.499	0.619	8	-0.341	0.505	-0.676	0.500	8	0.766	0.935	0.820	0.414
9	0.177	0.339	0.522	0.602	9	-0.349	0.519	-0.672	0.503	9	0.829	0.959	0.864	0.389
10	0.191	0.350	0.545	0.586	10	-0.347	0.535	-0.649	0.517	10	0.895	0.987	0.906	0.366
11	0.204	0.361	0.564	0.573	11	-0.339	0.551	-0.615	0.539	11	0.959	1.019	0.941	0.348
12	0.215	0.371	0.580	0.562	12	-0.326	0.568	-0.574	0.566	12	1.029	1.052	0.978	0.330
13	0.224	0.381	0.589	0.557	13	-0.314	0.584	-0.538	0.591	13	1.096	1.086	1.010	0.314
14	0.230	0.390	0.590	0.556	14	-0.307	0.600	-0.511	0.610	14	1.155	1.118	1.033	0.303
15	0.232	0.398	0.583	0.561	15	-0.306	0.616	-0.496	0.620	15	1.198	1.151	1.041	0.300
16	0.231	0.405	0.570	0.569	16	-0.311	0.630	-0.493	0.622	16	1.220	1.186	1.029	0.306
17	0.229	0.412	0.554	0.580	17	-0.321	0.644	-0.499	0.618	17	1.221	1.225	0.996	0.321
18	0.226	0.419	0.539	0.590	18	-0.335	0.658	-0.509	0.611	18	1.211	1.271	0.953	0.342
19	0.224	0.426	0.527	0.599	19	-0.347	0.672	-0.517	0.606	19	1.201	1.321	0.909	0.365
20	0.225	0.432	0.520	0.603	20	-0.356	0.687	-0.519	0.604	20	1.205	1.374	0.877	0.382
21	0.226	0.437	0.518	0.605	21	-0.359	0.701	-0.512	0.609	21	1.231	1.427	0.862	0.390
22	0.230	0.441	0.520	0.603	22	-0.355	0.714	-0.497	0.620	22	1.282	1.477	0.867	0.387
23	0.233	0.445	0.524	0.601	23	-0.346	0.727	-0.475	0.635	23	1.354	1.523	0.889	0.375
24	0.236	0.448	0.526	0.599	24	-0.331	0.739	-0.448	0.655	24	1.436	1.564	0.918	0.360
25	0.237	0.451	0.527	0.599	25	-0.314	0.749	-0.419	0.676	25	1.525	1.600	0.953	0.342
26	0.237	0.453	0.524	0.601	26	-0.296	0.758	-0.391	0.696	26	1.615	1.632	0.990	0.324
27	0.236	0.455	0.518	0.605	27	-0.280	0.767	-0.365	0.715	27	1.699	1.660	1.023	0.308
28	0.233	0.457	0.510	0.611	28	-0.266	0.775	-0.343	0.732	28	1.771	1.686	1.050	0.296
29	0.230	0.459	0.501	0.617	29	-0.255	0.781	-0.326	0.745	29	1.829	1.710	1.069	0.287
30	0.227	0.461	0.493	0.623	30	-0.247	0.788	-0.313	0.754	30	1.870	1.733	1.079	0.283
31	0.225	0.462	0.486	0.627	31	-0.242	0.793	-0.305	0.761	31	1.895	1.754	1.081	0.282
32	0.224	0.464	0.483	0.630	32	-0.239	0.799	-0.300	0.765	32	1.906	1.774	1.075	0.285
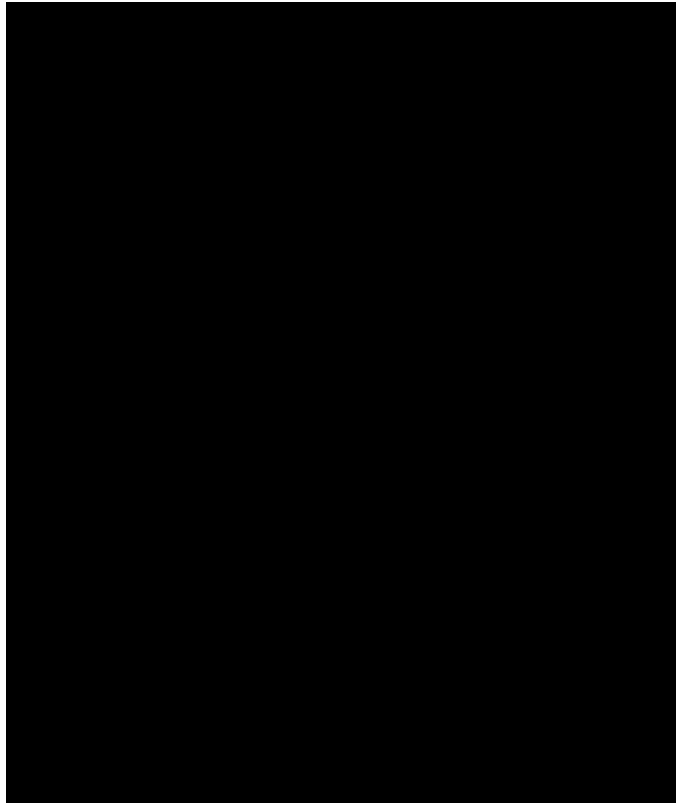
	Table 8 (a): *Long-run regressions of real Industrial Product Index on M1*					Table 8 (b): *Long-run regressions of real Industrial Product Index on M2*					Table 8 (c): *Long-run regressions of real Industrial Product Index on M3*			
k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value
1	0.287	0.489	0.586	0.560		1	-0.729	1.093	-0.667	0.508		1	0.016	1.469	0.011	0.991
2	0.202	0.540	0.374	0.709		2	-1.015	1.284	-0.790	0.432		2	-0.270	1.655	-0.163	0.871
3	0.174	0.581	0.299	0.766		3	-1.344	1.415	-0.950	0.346		3	-0.501	1.772	-0.283	0.778
4	0.147	0.613	0.240	0.811		4	-1.657	1.519	-1.091	0.280		4	-0.834	1.846	-0.452	0.653
5	0.122	0.642	0.189	0.850		5	-1.865	1.656	-1.126	0.265		5	-1.109	1.938	-0.572	0.569
6	0.106	0.668	0.159	0.874		6	-1.937	1.808	-1.071	0.289		6	-1.239	2.029	-0.611	0.544
7	0.105	0.689	0.152	0.880		7	-1.863	1.954	-0.954	0.344		7	-1.192	2.087	-0.571	0.570
8	0.116	0.705	0.164	0.870		8	-1.633	2.091	-0.781	0.438		8	-0.960	2.111	-0.455	0.651
9	0.134	0.715	0.188	0.852		9	-1.243	2.230	-0.558	0.580		9	-0.563	2.131	-0.264	0.793
10	0.154	0.721	0.214	0.831		10	-0.699	2.375	-0.294	0.770		10	-0.051	2.187	-0.023	0.981
11	0.173	0.726	0.237	0.813		11	-0.030	2.507	-0.012	0.991		11	0.487	2.306	0.211	0.834
12	0.186	0.733	0.254	0.800		12	0.697	2.599	0.268	0.790		12	0.943	2.464	0.383	0.704
13	0.195	0.744	0.263	0.794		13	1.377	2.647	0.520	0.605		13	1.222	2.611	0.468	0.642
14	0.198	0.757	0.261	0.795		14	1.909	2.680	0.713	0.480		14	1.280	2.703	0.474	0.638
15	0.191	0.774	0.246	0.807		15	2.245	2.726	0.823	0.414		15	1.128	2.734	0.413	0.682
16	0.136	0.768	0.178	0.860		16	2.387	2.762	0.864	0.392		16	0.675	2.666	0.253	0.801
17	0.066	0.758	0.087	0.931		17	2.392	2.819	0.848	0.401		17	0.085	2.596	0.033	0.974
18	-0.018	0.743	-0.024	0.981		18	2.318	2.886	0.803	0.426		18	-0.588	2.554	-0.230	0.819
19	-0.108	0.725	-0.149	0.882		19	2.224	2.943	0.756	0.454		19	-1.279	2.580	-0.496	0.623
20	-0.196	0.706	-0.278	0.782		20	2.157	2.974	0.725	0.472		20	-1.905	2.696	-0.707	0.484
21	-0.276	0.690	-0.399	0.692		21	2.139	2.968	0.721	0.475		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
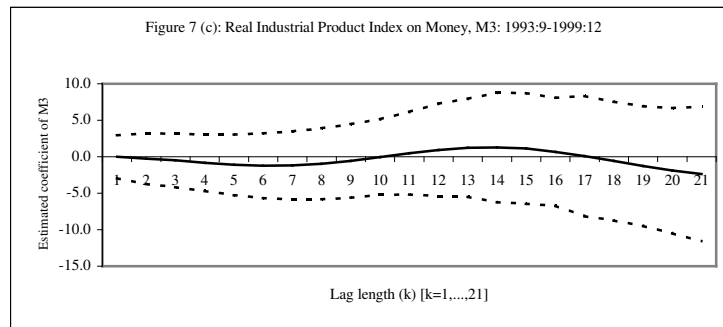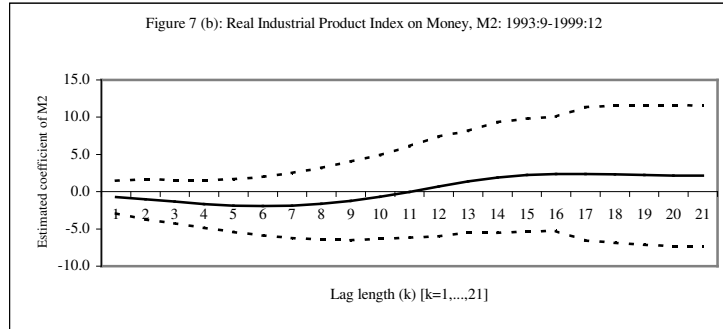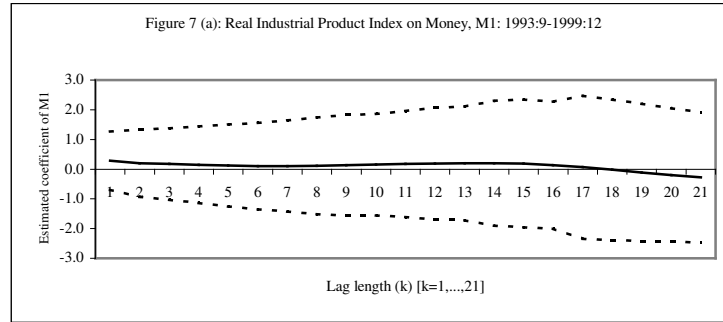
	Table 9 (a): *Long-run regressions of real Mining Index on M1*					Table 9 (b): *Long-run regressions of real Mining Index on M2*					Table 9 (c): *Long-run regressions of real Mining Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.387	0.348	1.112	0.267	1	0.263	0.499	0.527	0.598	1	0.490	1.148	0.427	0.670
2	0.316	0.389	0.813	0.417	2	0.076	0.541	0.140	0.889	2	0.484	1.176	0.412	0.681
3	0.302	0.430	0.703	0.483	3	-0.085	0.581	-0.147	0.883	3	0.507	1.242	0.408	0.684
4	0.311	0.467	0.666	0.506	4	-0.210	0.614	-0.342	0.733	4	0.511	1.317	0.388	0.699
5	0.332	0.502	0.661	0.509	5	-0.302	0.642	-0.471	0.638	5	0.514	1.392	0.369	0.713
6	0.358	0.533	0.672	0.503	6	-0.370	0.666	-0.556	0.579	6	0.525	1.460	0.359	0.720
7	0.388	0.562	0.690	0.491	7	-0.418	0.688	-0.607	0.544	7	0.552	1.522	0.363	0.717
8	0.421	0.589	0.715	0.475	8	-0.447	0.710	-0.629	0.530	8	0.601	1.582	0.380	0.705
9	0.457	0.614	0.745	0.457	9	-0.456	0.731	-0.624	0.533	9	0.669	1.645	0.406	0.685
10	0.496	0.637	0.778	0.437	10	-0.450	0.754	-0.597	0.551	10	0.748	1.714	0.436	0.663
11	0.535	0.658	0.813	0.417	11	-0.432	0.777	-0.556	0.579	11	0.830	1.789	0.464	0.643
12	0.574	0.678	0.846	0.398	12	-0.408	0.803	-0.508	0.612	12	0.920	1.866	0.493	0.623
13	0.610	0.697	0.876	0.382	13	-0.386	0.830	-0.465	0.642	13	1.003	1.941	0.517	0.606
14	0.642	0.714	0.899	0.369	14	-0.372	0.856	-0.434	0.665	14	1.076	2.011	0.535	0.593
15	0.669	0.730	0.917	0.360	15	-0.366	0.881	-0.415	0.678	15	1.137	2.079	0.547	0.586
16	0.692	0.743	0.931	0.353	16	-0.368	0.906	-0.407	0.685	16	1.181	2.152	0.549	0.584
17	0.712	0.756	0.942	0.347	17	-0.376	0.930	-0.404	0.687	17	1.211	2.234	0.542	0.589
18	0.731	0.767	0.953	0.342	18	-0.384	0.954	-0.402	0.688	18	1.236	2.325	0.531	0.596
19	0.750	0.777	0.965	0.335	19	-0.389	0.979	-0.398	0.691	19	1.271	2.424	0.524	0.601
20	0.770	0.786	0.980	0.328	20	-0.388	1.004	-0.387	0.699	20	1.332	2.523	0.528	0.598
21	0.791	0.794	0.996	0.320	21	-0.379	1.029	-0.368	0.713	21	1.433	2.619	0.547	0.585
22	0.811	0.801	1.013	0.312	22	-0.362	1.054	-0.343	0.732	22	1.578	2.704	0.583	0.561
23	0.830	0.806	1.030	0.304	23	-0.337	1.077	-0.313	0.754	23	1.764	2.777	0.635	0.527
24	0.846	0.810	1.045	0.297	24	-0.306	1.099	-0.278	0.781	24	1.962	2.840	0.691	0.491
25	0.859	0.813	1.056	0.292	25	-0.274	1.120	-0.245	0.807	25	2.174	2.892	0.752	0.454
26	0.867	0.816	1.063	0.289	26	-0.244	1.138	-0.214	0.831	26	2.383	2.934	0.812	0.418
27	0.871	0.818	1.065	0.288	27	-0.219	1.155	-0.190	0.849	27	2.575	2.971	0.867	0.388
28	0.872	0.819	1.065	0.288	28	-0.202	1.169	-0.173	0.863	28	2.741	3.004	0.913	0.363
29	0.873	0.821	1.063	0.289	29	-0.194	1.182	-0.164	0.870	29	2.876	3.035	0.948	0.345
30	0.873	0.822	1.062	0.289	30	-0.193	1.193	-0.162	0.872	30	2.977	3.065	0.971	0.333
31	0.875	0.823	1.063	0.289	31	-0.200	1.202	-0.167	0.868	31	3.046	3.092	0.985	0.327
32	0.880	0.824	1.068	0.287	32	-0.214	1.210	-0.177	0.860	32	3.087	3.117	0.990	0.324

	Table 10 (a): *Long-run regressions of real Plantation Index on M1*					Table 10 (b): *Long-run regressions of real Plantation Index on M2*					Table 10 (c): *Long-run regressions of real Plantation Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.433	0.290	1.491	0.137	1	0.218	0.549	0.397	0.692	1	0.470	0.861	0.546	0.586
2	0.394	0.327	1.205	0.229	2	-0.009	0.641	-0.015	0.988	2	0.519	0.972	0.534	0.594
3	0.397	0.360	1.103	0.271	3	-0.188	0.703	-0.268	0.789	3	0.548	1.078	0.509	0.612
4	0.418	0.390	1.072	0.285	4	-0.309	0.742	-0.417	0.677	4	0.558	1.170	0.477	0.634
5	0.446	0.416	1.074	0.284	5	-0.379	0.769	-0.493	0.623	5	0.573	1.251	0.458	0.647
6	0.479	0.439	1.089	0.277	6	-0.413	0.789	-0.523	0.601	6	0.603	1.322	0.456	0.649
7	0.512	0.462	1.110	0.268	7	-0.421	0.803	-0.525	0.600	7	0.653	1.385	0.471	0.638
8	0.546	0.483	1.131	0.259	8	-0.412	0.816	-0.505	0.614	8	0.726	1.443	0.503	0.616
9	0.578	0.503	1.150	0.251	9	-0.387	0.828	-0.467	0.641	9	0.818	1.501	0.545	0.587
10	0.609	0.522	1.166	0.245	10	-0.350	0.840	-0.417	0.677	10	0.921	1.560	0.590	0.556
11	0.637	0.541	1.179	0.240	11	-0.306	0.853	-0.358	0.721	11	1.028	1.622	0.634	0.527
12	0.663	0.558	1.188	0.236	12	-0.256	0.868	-0.294	0.769	12	1.141	1.684	0.678	0.499
13	0.684	0.575	1.190	0.235	13	-0.207	0.883	-0.235	0.815	13	1.247	1.743	0.716	0.475
14	0.700	0.591	1.184	0.238	14	-0.164	0.897	-0.183	0.855	14	1.342	1.799	0.746	0.457
15	0.709	0.606	1.171	0.243	15	-0.130	0.911	-0.143	0.887	15	1.418	1.854	0.765	0.446
16	0.714	0.620	1.152	0.251	16	-0.106	0.925	-0.115	0.909	16	1.475	1.910	0.772	0.441
17	0.715	0.633	1.129	0.260	17	-0.090	0.939	-0.096	0.924	17	1.516	1.972	0.769	0.443
18	0.714	0.646	1.106	0.270	18	-0.078	0.954	-0.082	0.935	18	1.554	2.043	0.761	0.448
19	0.714	0.657	1.086	0.279	19	-0.066	0.970	-0.069	0.945	19	1.604	2.123	0.755	0.451
20	0.715	0.668	1.070	0.286	20	-0.051	0.986	-0.052	0.959	20	1.678	2.209	0.759	0.449
21	0.718	0.678	1.059	0.291	21	-0.029	1.003	-0.029	0.977	21	1.783	2.296	0.777	0.439
22	0.723	0.687	1.052	0.294	22	0.000	1.019	0.000	1.000	22	1.921	2.381	0.807	0.421
23	0.727	0.695	1.047	0.296	23	0.035	1.035	0.034	0.973	23	2.082	2.458	0.847	0.399
24	0.732	0.701	1.044	0.298	24	0.076	1.049	0.072	0.943	24	2.254	2.529	0.891	0.374
25	0.734	0.707	1.039	0.300	25	0.119	1.063	0.112	0.911	25	2.428	2.590	0.938	0.350
26	0.735	0.712	1.033	0.303	26	0.162	1.075	0.151	0.880	26	2.595	2.642	0.982	0.328
27	0.734	0.716	1.025	0.307	27	0.205	1.085	0.189	0.851	27	2.748	2.687	1.023	0.308
28	0.731	0.720	1.015	0.311	28	0.244	1.094	0.223	0.823	28	2.885	2.727	1.058	0.292
29	0.728	0.725	1.005	0.316	29	0.281	1.102	0.255	0.799	29	3.004	2.765	1.087	0.279
30	0.725	0.729	0.995	0.321	30	0.313	1.109	0.283	0.778	30	3.105	2.800	1.109	0.270
31	0.723	0.732	0.987	0.325	31	0.342	1.116	0.307	0.759	31	3.187	2.834	1.125	0.263
32	0.722	0.736	0.981	0.328	32	0.367	1.122	0.327	0.744	32	3.252	2.867	1.135	0.259
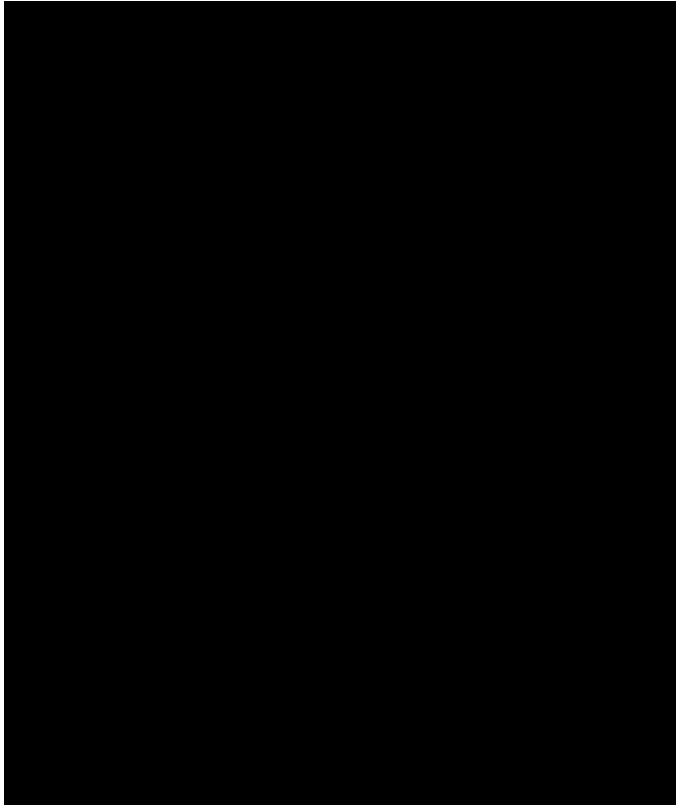
	Table 11 (a): *Long-run regressions of real Property Index on M1*					Table 11 (b): *Long-run regressions of real Property Index on M2*					Table 11 (c): *Long-run regressions of real Property Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.150	0.307	0.488	0.626	1	0.554	0.473	1.171	0.243	1	1.059	0.877	1.207	0.229
2	0.097	0.323	0.299	0.765	2	0.396	0.527	0.752	0.453	2	1.088	0.931	1.169	0.244
3	0.099	0.345	0.286	0.775	3	0.276	0.575	0.480	0.632	3	1.164	0.987	1.179	0.240
4	0.117	0.368	0.318	0.751	4	0.191	0.614	0.312	0.756	4	1.236	1.045	1.183	0.239
5	0.141	0.389	0.363	0.717	5	0.131	0.644	0.203	0.839	5	1.305	1.102	1.184	0.238
6	0.168	0.410	0.409	0.683	6	0.086	0.670	0.129	0.898	6	1.374	1.153	1.192	0.235
7	0.194	0.429	0.452	0.652	7	0.054	0.693	0.078	0.938	7	1.453	1.198	1.212	0.228
8	0.220	0.448	0.492	0.623	8	0.036	0.714	0.051	0.960	8	1.543	1.240	1.244	0.215
9	0.247	0.466	0.531	0.596	9	0.033	0.735	0.045	0.965	9	1.644	1.283	1.282	0.202
10	0.275	0.484	0.568	0.570	10	0.044	0.757	0.058	0.954	10	1.754	1.329	1.320	0.189
11	0.302	0.500	0.603	0.547	11	0.066	0.779	0.085	0.933	11	1.873	1.379	1.359	0.176
12	0.328	0.516	0.635	0.526	12	0.099	0.801	0.123	0.902	12	2.018	1.427	1.414	0.159
13	0.350	0.530	0.660	0.510	13	0.131	0.824	0.159	0.874	13	2.168	1.472	1.473	0.143
14	0.367	0.544	0.675	0.500	14	0.157	0.845	0.185	0.853	14	2.309	1.514	1.526	0.129
15	0.378	0.556	0.681	0.497	15	0.171	0.866	0.197	0.844	15	2.425	1.553	1.561	0.121
16	0.385	0.567	0.679	0.498	16	0.173	0.885	0.195	0.845	16	2.507	1.598	1.569	0.119
17	0.389	0.578	0.673	0.502	17	0.165	0.904	0.182	0.856	17	2.560	1.650	1.551	0.123
18	0.392	0.589	0.666	0.506	18	0.152	0.922	0.164	0.870	18	2.599	1.712	1.518	0.131
19	0.396	0.598	0.661	0.509	19	0.140	0.941	0.149	0.882	19	2.648	1.780	1.488	0.139
20	0.402	0.607	0.662	0.509	20	0.135	0.961	0.140	0.889	20	2.726	1.846	1.477	0.142
21	0.410	0.615	0.667	0.506	21	0.139	0.980	0.141	0.888	21	2.846	1.906	1.493	0.138
22	0.419	0.622	0.675	0.501	22	0.153	0.999	0.153	0.879	22	3.009	1.956	1.538	0.126
23	0.429	0.627	0.683	0.495	23	0.175	1.018	0.172	0.864	23	3.206	1.998	1.605	0.111
24	0.437	0.632	0.690	0.491	24	0.204	1.035	0.197	0.844	24	3.409	2.036	1.674	0.097
25	0.442	0.637	0.694	0.488	25	0.235	1.051	0.224	0.823	25	3.614	2.069	1.747	0.083
26	0.444	0.640	0.694	0.488	26	0.266	1.067	0.250	0.803	26	3.809	2.099	1.815	0.072
27	0.445	0.644	0.690	0.491	27	0.295	1.081	0.273	0.785	27	3.986	2.126	1.875	0.063
28	0.443	0.647	0.685	0.494	28	0.319	1.094	0.292	0.771	28	4.141	2.151	1.925	0.057
29	0.441	0.651	0.678	0.498	29	0.339	1.106	0.307	0.759	29	4.272	2.175	1.964	0.052
30	0.440	0.654	0.673	0.502	30	0.355	1.117	0.318	0.751	30	4.381	2.199	1.993	0.049
31	0.440	0.657	0.670	0.504	31	0.367	1.127	0.326	0.745	31	4.471	2.222	2.012	0.046
32	0.442	0.659	0.670	0.504	32	0.376	1.137	0.331	0.741	32	4.543	2.244	2.025	0.045
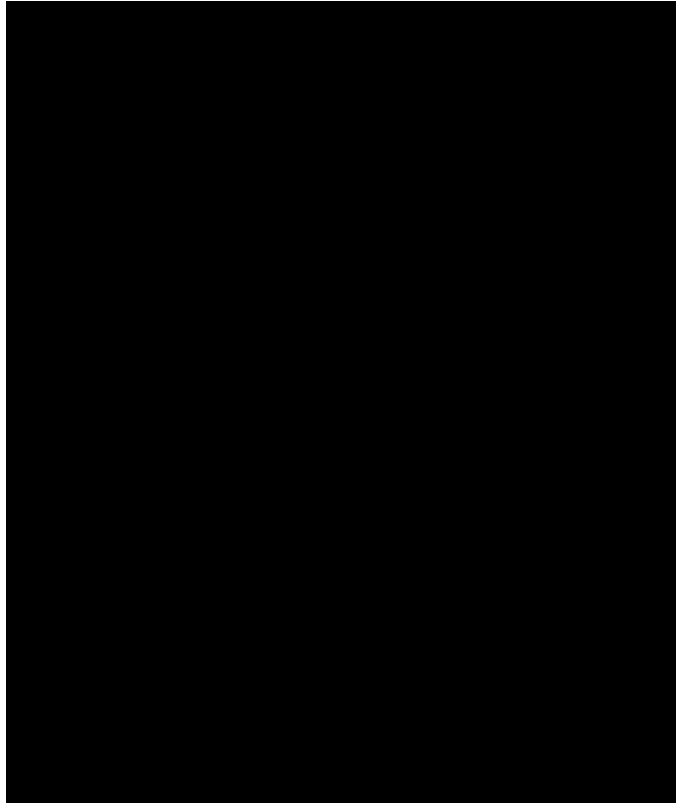
Table 12 (a): *Long-run regressions of real Second Board Index on M1*					Table 12 (b): *Long-run regressions of real Second Board Index on M2*					Table 12 (c): *Long-run regressions of real Second Board Index on M3*			
k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value	k	β_k	SE_k	t_k	p-value
1	0.333	0.569	0.586	0.560	1	-0.404	1.193	-0.339	0.736	1	-0.067	1.085	-0.061	0.951
2	0.222	0.596	0.372	0.711	2	-0.578	1.269	-0.456	0.650	2	-0.407	1.195	-0.341	0.734
3	0.231	0.623	0.371	0.711	3	-0.604	1.370	-0.441	0.660	3	-0.506	1.333	-0.380	0.705
4	0.267	0.648	0.412	0.681	4	-0.605	1.475	-0.410	0.683	4	-0.597	1.455	-0.410	0.683
5	0.306	0.668	0.458	0.648	5	-0.601	1.571	-0.383	0.703	5	-0.684	1.567	-0.436	0.664
6	0.346	0.685	0.506	0.614	6	-0.594	1.657	-0.359	0.721	6	-0.755	1.670	-0.452	0.652
7	0.388	0.658	0.590	0.557	7	-0.571	1.701	-0.336	0.738	7	-0.798	1.809	-0.441	0.660
8	0.434	0.668	0.650	0.518	8	-0.518	1.768	-0.293	0.770	8	-0.801	1.898	-0.422	0.674
9	0.485	0.676	0.717	0.476	9	-0.422	1.829	-0.231	0.818	9	-0.757	1.987	-0.381	0.704
10	0.541	0.682	0.793	0.430	10	-0.273	1.883	-0.145	0.885	10	-0.666	2.075	-0.321	0.749
11	0.606	0.688	0.881	0.381	11	-0.039	1.928	-0.020	0.984	11	-0.493	2.169	-0.227	0.821
12	0.676	0.693	0.977	0.332	12	0.257	1.969	0.130	0.897	12	-0.288	2.267	-0.127	0.899
13	0.748	0.696	1.075	0.286	13	0.598	2.016	0.297	0.768	13	-0.078	2.365	-0.033	0.974
14	0.815	0.698	1.168	0.246	14	0.954	2.078	0.459	0.647	14	0.100	2.454	0.041	0.968
15	0.873	0.699	1.249	0.216	15	1.292	2.158	0.599	0.551	15	0.214	2.522	0.085	0.933
16	0.920	0.701	1.313	0.193	16	1.584	2.249	0.704	0.483	16	0.249	2.570	0.097	0.923
17	0.957	0.702	1.362	0.177	17	1.822	2.343	0.778	0.439	17	0.219	2.610	0.084	0.934
18	0.986	0.704	1.401	0.165	18	2.012	2.431	0.828	0.410	18	0.155	2.665	0.058	0.954
19	1.015	0.706	1.438	0.155	19	2.170	2.511	0.864	0.390	19	0.108	2.747	0.039	0.969
20	1.047	0.707	1.481	0.143	20	2.312	2.584	0.895	0.374	20	0.126	2.853	0.044	0.965
21	1.084	0.707	1.533	0.130	21	2.444	2.648	0.923	0.359	21	0.246	2.964	0.083	0.934
22	1.125	0.706	1.593	0.116	22	2.565	2.705	0.948	0.346	22	0.485	3.063	0.158	0.875
23	1.154	0.703	1.642	0.105	23	2.652	2.747	0.966	0.338	23	0.875	3.157	0.277	0.783
24	1.182	0.699	1.692	0.095	24	2.707	2.771	0.977	0.332	24	1.347	3.245	0.415	0.679
25	1.205	0.693	1.739	0.087	25	2.718	2.773	0.980	0.331	25	1.853	3.339	0.555	0.581
26	1.223	0.686	1.782	0.079	26	2.683	2.748	0.977	0.332	26	2.339	3.441	0.680	0.499
27	1.235	0.679	1.820	0.073	27	2.607	2.698	0.966	0.337	27	2.760	3.538	0.780	0.438
28	1.243	0.671	1.852	0.069	28	2.501	2.631	0.950	0.345	28	3.086	3.612	0.854	0.396
29	1.249	0.664	1.882	0.064	29	2.377	2.558	0.929	0.356	29	3.309	3.653	0.906	0.368
30	1.256	0.658	1.909	0.061	30	2.253	2.490	0.905	0.369	30	3.440	3.666	0.938	0.352
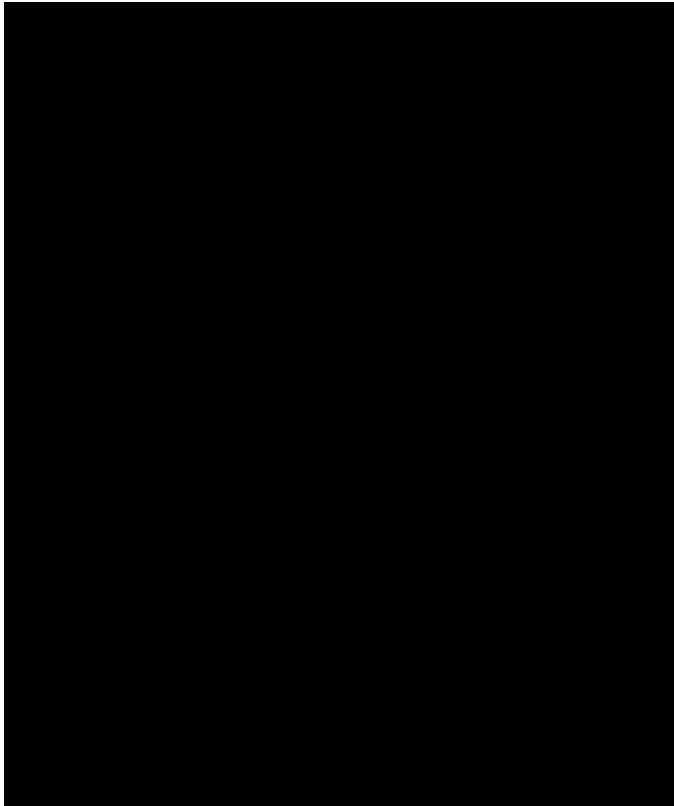
	Table 13 (a): *Long-run regressions of real Trading Index on M1*					Table 13 (b): *Long-run regressions of real Trading Index on M2*					Table 13 (c): *Long-run regressions of real Trading Index on M3*			
k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value		k	β_k	SE_k	t_k	p-value
1	0.419	0.404	1.037	0.304		1	-0.199	0.937	-0.212	0.833		1	1.025	1.247	0.822	0.414
2	0.311	0.455	0.684	0.497		2	-0.503	1.179	-0.427	0.671		2	0.825	1.491	0.553	0.582
3	0.265	0.504	0.526	0.601		3	-0.791	1.398	-0.566	0.574		3	0.753	1.722	0.438	0.663
4	0.239	0.548	0.435	0.665		4	-1.039	1.575	-0.660	0.512		4	0.623	1.915	0.325	0.746
5	0.227	0.585	0.389	0.699		5	-1.178	1.725	-0.683	0.498		5	0.533	2.072	0.257	0.798
6	0.232	0.615	0.377	0.708		6	-1.195	1.854	-0.644	0.522		6	0.553	2.187	0.253	0.801
7	0.252	0.639	0.394	0.695		7	-1.090	1.965	-0.555	0.581		7	0.712	2.251	0.316	0.753
8	0.285	0.658	0.433	0.667		8	-0.861	2.069	-0.416	0.679		8	1.015	2.278	0.445	0.658
9	0.327	0.674	0.485	0.630		9	-0.509	2.183	-0.233	0.816		9	1.440	2.302	0.625	0.534
10	0.371	0.689	0.539	0.592		10	-0.038	2.310	-0.017	0.987		10	1.944	2.358	0.824	0.413
11	0.414	0.704	0.588	0.559		11	0.536	2.434	0.220	0.827		11	2.460	2.463	0.999	0.323
12	0.451	0.720	0.627	0.534		12	1.165	2.527	0.461	0.647		12	2.902	2.598	1.117	0.269
13	0.483	0.739	0.652	0.517		13	1.763	2.580	0.683	0.498		13	3.189	2.722	1.171	0.247
14	0.504	0.762	0.662	0.511		14	2.237	2.610	0.857	0.396		14	3.279	2.803	1.170	0.248
15	0.514	0.786	0.654	0.516		15	2.528	2.641	0.957	0.343		15	3.176	2.838	1.119	0.269
16	0.470	0.785	0.598	0.553		16	2.624	2.650	0.990	0.327		16	2.793	2.792	1.000	0.322
17	0.404	0.778	0.519	0.606		17	2.569	2.669	0.963	0.341		17	2.273	2.736	0.831	0.411
18	0.317	0.761	0.417	0.679		18	2.418	2.691	0.899	0.374		18	1.660	2.688	0.618	0.540
19	0.217	0.736	0.296	0.769		19	2.231	2.700	0.826	0.413		19	1.011	2.672	0.379	0.707
20	0.114	0.707	0.161	0.873		20	2.064	2.683	0.769	0.446		20	0.397	2.721	0.146	0.885
21	0.016	0.680	0.023	0.982		21	1.955	2.634	0.742	0.462		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