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Money Supply and Equity Price Movements in Pakistan

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Abstract
The relationship between stock prices and money supply in Pakistan is examined by monthly data from January 1992 to June 2009. The Co-integration, Error-Correction Model and Granger Causality Techniques are used to test the causal association among money supply and stock prices. The empirical results indicate the uni-directional causal relationship between stock prices and money supply. The results also indicate that stock price has negative significant short run causal effect on money supply in Pakistan. It suggests that as stock prices increase, equities become more attractive as compared to other assets; thus there is a shift from money to stock. Money supply does not determine the stock price in long run. However, during the short run, broad money M_2 has significant causal effect on stock prices. Thus stock market, in the long run, is inefficient with respect to money supply. Moreover, income and interest rate do affect the stock prices, which suggest that tight monetary policy may be used more effectively to check the movement in stock prices in Pakistan.
Key Words: Money supply, stock price, interest rate

1. Introduction

The present value of future cash flows determines the stock prices, calculated by discounting the future cash flows at a discount rate. There exists a strong association between money supply and discount rate through the present value of cash flows. There are two approaches regarding the relationship between money supply and stock prices: (i) whether money supply determines stock prices [(Sellin, 2001; Bernanke and Kuttner, 2005; Corrado and Jordan, 2005; Sorensen, 1982)] and (ii) or stock prices determine money supply [(Hamburger, 1966; Keran, 1971; Hamburger and Kochin, 1972; Hamburger and Keran, 1987; Friedman, 1988; and McCornac, 1991)].

The first issue is addressed in the competing theories established by the Keynesian economists and other real activity theories. Keynesian economists argue that money supply and stock prices are negatively related, and impact of money supply changes on stock prices depends on expected future monetary policy. A positive change in money supply leads to expect a contractionary monetary policy in the future. People bid for funds anticipating decrease in future money supply, resulting in the rise of current interest rate. This rise in interest rate positively affects discount rates, which goes up, and the present value of future earnings decline which reduces the stock prices. Moreover, an increase in interest rate decreases economic activities and results in further decline in stock prices (Sellin, 2001). However, real activity economists maintain that money supply and stock prices are positively related, suggesting that when money supply increases, it increases money demand anticipating rise in economic activity. Greater economic activity indicates greater anticipated profitability, this increase the stock prices.

Money supply is not merely a matter of stock prices, but anticipated and unanticipated money supply has impact on stock prices. This issue leads to efficient market hypothesis in which every accessible information is reflected in stock prices. This implies that a change in anticipated money supply does not impact stock prices. However, unanticipated variation in money supply would affect the stock market prices. Moreover, opponents of the efficient market hypothesis argue that as all accessible information is not reflected in the stock prices and thus the anticipated changes in money supply affects stock prices as well (Corrado and Jordan, 2005).

The second approach discusses the determination of money supply by stock prices. According to this approach an increase in stock price has a positive wealth effect and a negative substitution effect on the demand for money (Friedman, 1988). Moreover, Baharumshah (2004) also suggested that "positive wealth effect may be due to three factors; namely, (i) the implied increase in nominal wealth, (ii) an increase in the expected return from risky assets relative to safe assets which induces economic agents to hold larger amounts of safer asset, such as money, and (iii) an induced rise in the volume of financial balances to facilitate them". The negative substitution effect of real stock prices on money demand implies that as the stock prices rise, equities become more in portfolio; thus there may be a shift from money to stocks. The monetary policy plays a significant role in most economies. For example, in case of positive wealth effect an increase in stock prices dominate, then higher stock prices imply that monetary authority should permit faster monetary growth to achieve a given nominal income or inflation target to avoid the target being undershot. On the other hand, if the substitution effect dominates, higher prices imply the need to tighten monetary policy.

This paper investigates the existence of a relationship among money supply and stock prices. If the relationship is positive then what is the causality of stock prices and money supply? Moreover, it also investigates whether stock prices determine money supply or money supply determines the stock prices. The paper is organized to present an outlined review of literature in the second section with section three to describe the econometric methodology and related issue followed by data in section four. The empirical results and interpretation are discussed in section five, whereas last section presents the conclusion.

2. Review of Literature

A number of researches linking money supply and stock prices are conducted in developed and developing countries. Some of the studies for developed countries include Schumpeter (1912), Sprinkel (1961), Homa and Jaffe (1971), Hamburger and Kochin (1972), Fama (1981, 1990), Chen (1986), Hamao (1988), Poterba and Summers (1988), Chen (1991), Macdonald and Power (1991), Thornton (1993), Kaneko and Lee (1995), Cheung and Ng (1998), Darrat and Dickens (1999), Flannery and Protopapadakis (2002). Studies conducted for developing countries comprise Mookherjee and Yu (1997) and Maysami and Koh (2000) for Singapore and Kwon and Shin (1999) for South Korea, and Habibullah and Baharumshah (1996), Ibrahim (1999), Ibrahim and Aziz (2003) for Malaysia and Kandir (2008) examined for Turkey. Few studies which investigated for emerging stock markets, include Shaheen and Nishat (2004) for Pakistan; Sharma and Singh (2007) for India; Wei (2000) for emerging markets. These studies recognize various variables such as industrial output, inflation, interest rate and money supply as significant factors in determing the stock prices.

Some studies confirm the negative relationship between money supply and stock prices and also support Keynesian views. Such studies are done by Cornell (1983), Pearce and Roley (1985), Sellin (2001), and Ibrahim and Aziz (2003). Cornell’s (1983) investigation approach is different from other economists. He explains this relationship through risk premium, stating that people keep the money in hand instead of other assets for precautionary motive and money demand is positively related to risk and risk aversion. When money supply increases unexpectedly it also increases money demand, given an accommodating monetary policy. Higher money demand indicates rise in risk. As a consequence, investors demand higher risk premium for holding stocks making them less attractive and thus equity prices fall (Sellin, 2001).

Other studies documented the existence of direct relationship among money supply and stock prices. These studies are done by Sprinkle (1964), Homa and Jaffe (1971), Bernanke and Kuttner (2005), and Maskay and Chapman (2007). Bernanke and Kuttner (2005) pooled the real activity and risk premium hypotheses. According to their result stock price depends on two factors, namely present value of future returns and the perceived risk to hold the stock. They supported the real activity hypothesis, but disagree with Cornell's (1983) risk premium hypothesis. This implies that stocks are appealing if the potential return is greater and the perceived risk of holding of stock is lower. Bernanke and Kuttner (2005) pointed out that money supply changes the stock prices through the present value of future returns as well as the perceived risk. It affects the present value of future returns by effecting interest rate. Researchers also agreed that decrease in the money supply increases real interest rate and argued that as the interest rate increases it raises the discount rate leading to decrease in the present value of future returns, as a result stock prices fall.

Some studies by Kandir (2008), Wei (2000), Husain and Mahmood (1999), Kraft and Kraft (1977), Alatiqi and Shokoofeh (2008) Ali, Rehman, Yilmaz, Aslam Afzal (2010) find no relationship between money supply and stock prices. Some studies even investigated efficient market hypothesis in stock market through anticipated and unanticipated change in money supply. These studies are under taken by Corrado and Jordan (2005), Sorensen (1982), Maskay and Chapman (2007).

Another approach regarding the link between money supply and stock prices is that stock price determines the money supply through positive wealth effect and negative substitution effect. Many researchers [(Hamburger, 1966; Keran, 1971; Hamburger and Kochin, 1972; Hamburger and Keran, 1987)] examined the relationship between stock prices and money demand generally includes the volume of transactions or the return on securities as variables in the money demand function. Similarly, Friedman (1988) and McCornac (1991) examined the nature of relationship between stock prices and money demand in the United States, and Japan respectively. This research supports the existence of positive wealth effect and a negative substitution effect; however results are sensitive to the time period as well as data. Gerdesmeir (1966) includes equity holdings indirectly as part of house and found a significant and positive effect of wealth on the demand for money. Choudry (1996) showed that stock prices are significant variable in both M_1 and M_2 money demand functions using data of United States and Canada. Moreover, real stock prices are significant and positive in the long-run demand function for real M_1 balances in case of Germany. Similarly Habibullah and Baharumshah (1996) studied the relationship between money supply, stock prices and output using two-step trivariate cointegration method for Malaysia. Some studies conducted co-integrated and causality between money supply and stock prices. They include Mukherjee and Naka (1995), Mookerjee and Yu (1997), Kwon and Shin (1999), Cheung and Ng (1998), Mukherjee and Yu (1997), Habibullah and Baharumshah (1996), Bhattacharya (2001) and Chakravarty (2005), Mookerjee (1988) and Ahmed (1999), Ali, Rehman, Yilmaz, Khan and Afzal (2010).

3. Theoretical Model and Econometric Methodology

This study empirically determines the relationship between stock prices and money supply. Narrow based money M_1 and broad based money M_2 are used as monetary expansion whereas SP is used as stock prices. The multivariate model is used to avoid the causality inference due to missing the relevant variable (Lutkepohl 1982). The theory suggests that if the stock prices (SP_t) and money supply (M_t) have stochastic trends and have long run equilibrium relationship, then SP_t and M_t are said to be cointegrated. Cointegration is a test for equilibrium between non-stationary variables integrated by same order. According to Engle and Granger (1987), cointegrated variables must have an ECM representation. Since it provides a formal background for testing and estimating short run and long run relationships among economic variables shows popularity of cointegration analysis. In addition, the ECM strategy also addresses the problem of spurious correlation. When SP_t and M_t are cointegrated, an ECM representation can be written as:

$$\Delta SP_t = \alpha_0 + \alpha_1 B_{t-1} + \sum_{i=1}^{n} \alpha_{2i} (1-L) \Delta M_{t-i} + \sum_{i=1}^{n} \alpha_{3i} (1-L) \Delta SP_{t-i} + e_t \quad (1)$$

$$\Delta M_t = \beta_0 + \beta_1 C_{t-1} + \sum_{i=1}^{n} \beta_{2i} (1-L) \Delta M_{t-i} + \sum_{i=1}^{n} \beta_{3i} (1-L) \Delta SP_{t-i} + u_t \quad (2)$$

To further precede the model, the stationarity of series is checked. Without checking the stationarity of series the result of estimated model is spurious. Unit root test is used to test the stationarity of series in which Augmented Dicky Fuller (ADF) test is applied to examine the same. These statistics are calculated with constant and time trend. ADF test is used by the following equations.

$$\Delta Y_t = a_0 + a_1 t + a_2 Y_{t-1} + a_3 \sum_{i=1}^{n} \Delta Y_{t-i} + e_t \quad (3)$$

ADF test is used to check whether the estimation of a_2 are equal to zero. If coefficient of a_2 with negative sign is less than critical t value, which based on Fuller (1976) criteria than Y_t is said to be stationary. If two series i.e. X_t and Y_t are considered to be stochastic trends and if they follow a common long run equilibrium relationship, then X_t and Y_t should be co-integrated with same order, i.e. I(d). Engle and Granger (1987) have shown that their linear combination in general also is I(d). After establishing the co-integration of order I(d) of variables, the long run relationships has been established by co-integration technique, which examine the issue of integrity short run dynamic with long run equilibrium.

First, a VAR (vector auto regressive) model is established for four variables (stock price, money supply, interest rate and income) and determine the optimal lag length on the basis of Akiake Information Criteria. Two lags are selected according to this criterion. With these lags we estimate the VAR model and examine the residual for normality and autocorrelation. Since the residual is stationary at the level, we use the multivariate co-integration techniques to establish the relationship between stock prices and money supply.

The maximum likelihood method is used as proposed by Johansen and Juselus (1990), which is more appropriate for the multivariate system under consideration. To select the number of co-integration vector "r", Johansen and Juselus (1990) reported two likelihood ratio tests. These tests are trace statistics and maximal Eigen value. Later, the Error

Correction Models (ECM) were used to examine the relation between economic growth and stock market indicators, because ECM provides an answer to the problems of spurious correlations. The ECM model is established in the following equations:

$$\Delta SP_t = \alpha_0 + \alpha_1 B_{t-1} + \sum_{i=1}^{n} \alpha_{2i} (1-L)\Delta MR_{t-i} + \sum_{i=1}^{n} \alpha_{3i} (1-L)\Delta SP_{t-i} + \sum_{i=1}^{n} \alpha_{4i} (1-L)\Delta X_{t-i} + e_t \quad (4)$$

$$\Delta ER_t = \beta_0 + \beta_1 C_{t-1} + \sum_{i=1}^{n} \beta_{2i} (1-L)\Delta M_{t-i} + \sum_{i=1}^{n} \beta_{3i} (1-L)\Delta SP_{t-i} + \sum_{i=1}^{n} \beta_{4i} (1-L)\Delta X_{t-i} + u_t \quad (5)$$

Where X_t represents the third variable such as income (Yt) and interest rate (r_t). In ECM equations (4) and (5) B_{t-1} and E_{t-1} are error correction terms and D denotes a first difference of a variable. If correction terms are statistically significant it suggests that economic forces are adjusted towards long run equilibrium. It implies that stock prices and money supply are adjusted towards long run equilibrium. Jones and Joulfaian (1991) state that the lag change in the independent variables represents the short run causal impact, while the error correction terms measures the long run effects. To check the stability across different sub-periods, cumulative sum (CUSUM) and length of lag is used which is chosen on the basis of Akiake Information Criteria.

4. Data

The monthly data used in this study covers the period from January 1992 to June 2009. The data for money supply (M_t) and interest rate (r_t) are taken from various issues of the State Bank of Pakistan's (SBP) Annual Report. The data for stock prices and income are taken from the Monthly Statistical Bulletin published by the State Bank of Pakistan.

5. Empirical Results

Table 1 shows the descriptive statistics of daily data for KSE-100 index, money supply (M_1, and M_2), interest rate, and income, indicating that the frequency distribution of the return series of KSE-100 index, money supply (M_1, and M_2), interest rate, and income are not normal. For normally distributed return series the skewness coefficient is zero and Kurtosis is 3. In a Guassian distribution, the kurtosis coefficient is expected to be 3. Generally, a much higher or lower Kurtosis indicates extreme leptokurtic or extreme platykurtic (Parkinson, 1987). In this study the highest coefficient of kurtosis observed for KSE-100 index is 9.728. It falls under the leptokurtic distribution. The lower coefficient of kurtosis is observed in money supply (M_1) (1.954), which indicates that the series is slim and has a long tail. Joruque Berra (JB) test shows more clearly the normal distribution of series. If it is zero it indicates that series are normally distributed. All return series indicate positive and higher value of Joruque Berra (JB). Generally, values for skewness zero and kurtosis value 3 and JB zero indicate that observed distribution is normally distributed. Thus, skewness and leptokurtic frequency distribution of KSE-100 index, interest rate, money supply and income indicate that the distribution is not normal. In other words, the non-normal frequency distributions of KSE-100 index, interest rate, money supply (M_1, and M_2) and income indicate that series deviate from the prior condition of random walk model.

In order to examine the integration of the variables the co-integration test is used to check whether the series are stationary or non-stationary. ADF unit root test is applied in which the error term is assumed to be normal. In order to check the data correction generating process one needs to check the significant of a constant and trend as well as to check the absent of auto-correlation. The results in Table 2, indicate that the variables are non-stationary in their level data in all variables and stationary at level with intercept at first difference. It implies that KSE-100 index, interest rate, money supply (M_1, and M_2) and income are stationary at I(1) at first difference with constant and trend.

After examining the stationarity of the individual series at I(1), the Johanson and Juselius (1988) test is used to determine the long run equilibrium relationship between stock prices and money supply (M_1, and M_2) . The results from Johanson co-integration are presented in Table 3 and Table 4 for narrow based money (M_1) and broad based money (M_2) respectively. It shows the result of KSE-100 index, interest rate, money supply (M_1, and M_2) and income respectively. The result for M_1, and M_2 examines the null hypothesis about no co-integration (r=0) the trace statistics is 71.412 that is above 5 percent critical value i.e. 47.21. This implies that it rejects the null hypothesis i.e. H_0 : r=0 and accepts the alternative hypothesis i.e. $r \geq 0$. As is evident in table 3, the null hypothesis $r \leq 1$, $r \leq 2$, and $r \leq 3$ cannot be rejected at 5 percent level of significance. Thus, there is only one cointegration relationship involving four variables of KSE-100 index, interest rate, narrow and broad money supply and income. Turning to maximum eigen value, the null hypothesis of no cointegration (r=0) is rejected at 5% level of significance in favor of the alternative hypothesis that there is one cointegrating vector, r=1. However, the test fails to reject the null hypothesis of r ≤ 1, r ≤ 2, and r ≤ 3. This infers that there is only one cointegrating relationship amongst the four I(1) variables. Thus, both the trace and the maximum Eigen value test statistics reject the null hypothesis of r=0 at 5% level of significance, and suggest that there is a unique cointegrating vector

The cointegrating vectors are given in Table 5 and Table 6, which show that the narrow based money supply (M_1) and broad based money supply (M_2) is inversely related to stock prices. However, this relationship is insignificant in case of M_1 and significant for M_2. It indicates that the higher the stock prices lower M_2. It implies that if stock price increases people purchase more stock that ultimately decrease in money supply from the economy. M_1 and M_2 are also negatively related to the interest rate, which proves the validity of theory in the negative relationship between interest and money supply exist. However, the relationship between M1 and interest rate is insignificant. Tables 7 and Table 8 show the impact of stock prices, interest rate, and income on M_1 and M_2 respectively. The stock prices are negatively related to M_1 and M_2. However, this relationship is insignificant for both M_1, and M_2. This finding is in contradiction to the findings of the theory in which it is said that increase in money supply is expected to create money supply balances and excess demand for shares, as a result share prices will rise. Stock prices are negatively related to interest rate and positively related to income. The significance relationship between money supply and stock prices in Table 5 and Table 6 indicate that stock prices determine money supply i.e. as stock price rises, equities become more attractive as compared to other assets; thus there is a shift from money to stock. In this situation there is a need to tighten monetary policy.

After establishing the co-integration relationship, ECM is applied to determine the short run behavior of stock price to money supply (M_1 and M_2). The results of ECM are presented in Table 9 and Table 10. The estimated coefficient of error correction terms B_{t-1} and E_{t-1} show the long run relation. This is statistically insignificant with negative sign representing that long run relationship does not exist among variables. The estimated coefficient of error correction term shows that the system does not correct its previous level of disequilibrium in a month. Whereas the coefficient of lagged values of stock prices and money supply are significant showing that a short run relation exists between stock prices and money supply. However, no relation is found between stock price and interest rate and income.

To check the stability of the estimated model CUSUM and CUSUM square are applied. These tests employ graphical techniques, which show the plot of CUSUM and CUSUM square statistics, and also a pair of straight line drawn at 5% level of significance. If either of the line crosses, the null hypothesis that the regression coefficients are stable must be rejected at 5 % level of significance. The figures from 1 to 4 show that the parameters of the error correction models are instable during the sample periods.

6. Concluding Remarks

The study examines the causal relationship between stock prices and money supply. The empirical results indicate stock price determine money supply in Pakistan. However, stock price has no long run effect on money supply in Pakistan. During the short run, stock prices has significant causal effect on stock prices. Money supply does not determine the stock price in long run. However, during the short run, broad money M_2 has significant causal effect on stock prices. It implies that the stock market, in the long run, is not efficient with respect to Money supply. Moreover, income and interest rate do affect the stock prices, which suggest that monetary policy could be used more effectively to check the movement in stock prices in Pakistan.

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Table 1. Descriptive Statistics

	M_1	M_2	KSE-100 Index	Income	Interest Rate
Mean	13.491	14.162	7.956	4.967	2.223
Median	13.47	14.095	7.524	4.679	2.251
Maximum	14.965	15.452	14.179	6.995	2.911
Minimum	12.521	12.803	6.783	4.386	0.507
S.Devation	0.637	0.71	0.958	0.736	0.353
Skewness	0.3	0.043	1.713	1.941	-1.383
Kurtosis	1.954	2.06	9.728	5.503	6.958
Jorque Bera	12.731	7.8	498.828	186.754	204.08
N	210	210	210	210	210
CV	4.722	5.013	12.041	14.818	15.879

Table 2. Augumented Dicky Fuller Unit Root Test

Variables	With Intercept		With intercept and trend		N	Critical values		
	Level	Ist diff.	Level	Ist diff.		1%	5%	10%
M1	-0.798	-10.758	-3.83	-10.733	210	-3.462	-2.875	-2.574
M2	-0.45	-12.257	-2.053	-12.228	210	-3.462	-2.875	-2.574
Stock Ret.	-3.266	-17.293	-5.224	-17.251	210	-3.462	-2.875	-2.574
Income	0.622	-10.375	-1.022	-10.551	210	-4.005	-3.432	-3.14
Interest	-7.141	-17.026	-7.202	-16.989	210	-4.005	-3.432	-3.14

Table 3. Johansen First Information Maximum Likelihood Test for Co-Integration (M1)

Rank	Likelihood Ratio	5%critical Value	1% ritical value	Max. Eigenvalue	5%critical value	1%critical value
R=0	71.412	47.21	54.46	43.003	30.9	38.77
R≤1	28.409	29.68	35.65	15.473	24.75	32.24
R≤2	12.936	15.41	20.04	11.386	18.60	25.52
R≤3	1.550	3.76	6.65	1.550	12.07	18.63

Table 4. Johansen First Information Maximum Likelihood Test for Co-Integration (M2)

Rank	Likelihood Ratio	5%critical Value	1% ritical value	Max. Eigenvalue	5%critical Value	1%critical value
R=0	74.801	47.210	54.460	42.442	30.9	38.77
R≤1	32.359	29.680	35.650	23.744	24.75	32.24
R≤2	8.615	15.410	20.040	7.142	18.60	25.52
R≤3	1.473	3.760	6.650	1.473	12.07	18.63

Table 5. Estimates of the Cointegrating Vectors of M1
Normalized Cointegrating Coefficients: 1 Cointegrating Equation

C	Stock Price	Interest rate	Income
-23.682	-0.395 (-0.53)	-1.623 (-1.402)	9.62 (-8.3)

Table 6. Estimates of the Cointegrating Vectors of M2
Normalized Cointegrating Coefficients: 1 Cointegrating Equation

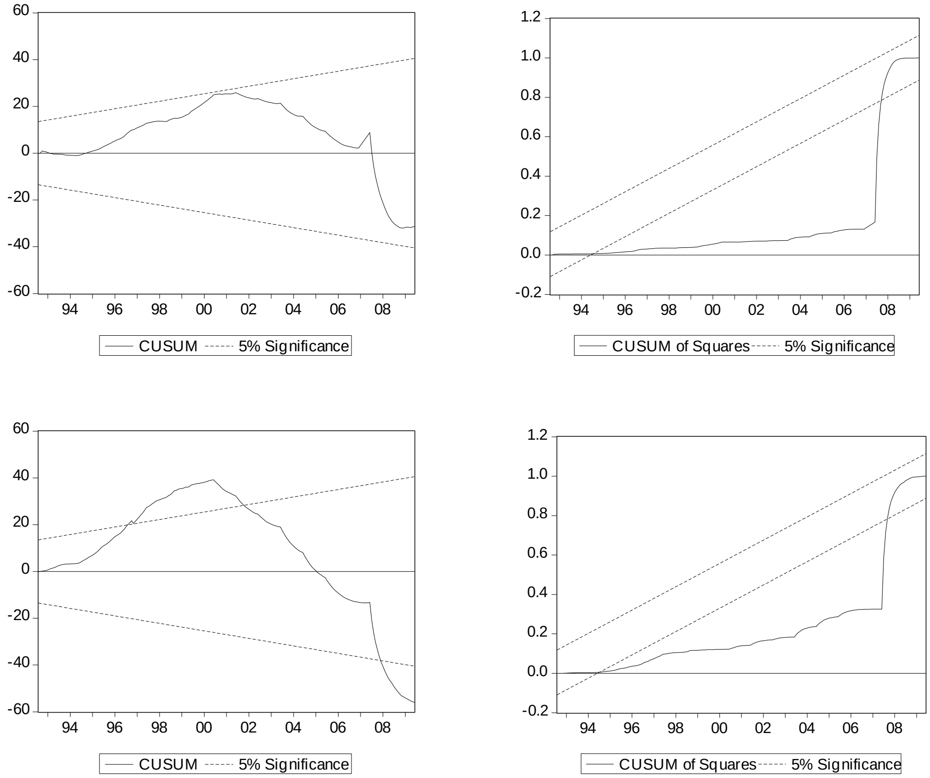
C	Stock Price	Interest rate	Income
59.994	-2.533 (-3.403)	-24.371 (-40.863)	4.112 (7.744)

Table 7. Estimates of the Cointegrating Vectors of Stock prices
Normalized Cointegrating Coefficients: 1 Cointegrating Equation

C	M1	Interest rate	Income
-16.757	-0.437 (-0.267)	4.289 (-1.931)	-0.7 (-0.365)

Table 8. Estimates of the Cointegrating Vectors of Stock Prices
Normalized Cointegrating Coefficients: 1 Cointegrating Equation

C	M2	Interest rate	Income
38.346	-2.288 (-1.398)	-9.814 (-7.489)	1.602 (-1.672)


CUSUM
5% Significance
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CUSUM
5% Significance
CUSUM of Squares
5% Significance

Table 9. Regression Results for Error Correction Models (M_1 and SP)

Firms		ΔM1	ΔSP
Constant	Coefficient	0.014	0.024
	SE	-0.007	-0.044
	t-value	-2.026	-0.549
$\Delta M_1(-1)$	Coefficient	-0.232	-0.108
	SE	-0.106	-0.662
	t-value	-2.197	-0.164
$\Delta M_1(-2)$	Coefficient	-0.028	-0.308
	SE	-0.104	-0.656
	t-value	-27275	-0.469
ΔSP(-1)	Coefficient	-0.001	-0.641
	SE	-0.011	-0.069
	t-value	-0.086	-9.279
ΔSP(-2)	Coefficient	-0.002	-0.332
	SE	-0.011	-0.068
	t-value	-0.193	-4.873
ΔR(-1)	Coefficient	0.031	0.031
	SE	-0.024	-0.149
	t-value	-1.307	-0.206
ΔR(-2)	Coefficient	-0.011	-0.04
	SE	-0.02	-0.128
	t-value	-0.562	-0.312
ΔY(-1)	Coefficient	-0.155	-0.136
	SE	-0.088	-0.55
	t-value	-1.777	-0.247
ΔY(-1)	Coefficient	-0.018	-0.214
	SE	-0.087	-0.549
	t-value	-0.215	-0.39
B(-1)	Coefficient	-0.002	
	SE	-0.002	
	t-value	-1.054	
C(-1)	Coefficient		-0.001
	SE		-0.014
	t-value		-0.079
R-squared		0.047	0.318
Adj. R-squared		0.003	0.287
Akaike AIC		-1.884	1.79
Schwarz SC		-1.723	1.951
Mean dependent		0.01	0.008

Table 10. Regression Results for Error Correction Models (M_2 and SP)

Firms		ΔM_2	ΔSP
Constant	Coefficient	0.017	0.131
	SE	-0.002	-0.043
	t-value	-8.023	-3.025
$\Delta M_2(-1)$	Coefficient	-0.244	4.3
	SE	-0.072	-1.488
	t-value	-3.39	-2.889
$\Delta M_2(-2)$	Coefficient	-0.102	-14.582
	SE	-0.077	-1.592
	t-value	-1.322	-916129
ΔSP(-1)	Coefficient	0.000	-0.453
	SE	-0.003	-0.058
	t-value	-0.050	-7.759
ΔSP(-2)	Coefficient	0.004	-0.248
	SE	-0.003	-0.055
	t-value	-1.510	-4.495
ΔR(-1)	Coefficient	0.001	-0.019
	SE	-0.006	-0.118
	t-value	-0.123	-0.165
ΔR(-2)	Coefficient	0.001	-0.057
	SE	-0.005	-0.100
	t-value	-0.293	-0.568
ΔY(-1)	Coefficient	0.007	0.186
	SE	-0.015	-0.304
	t-value	-0.460	-0.612
ΔY(-1)	Coefficient	0.011	0.55
	SE	-0.014	-0.299
	t-value	-0.734	-1.838
B(-1)	Coefficient	0.000	-------
	SE	-0.001	-------
	t-value	-0.014	-------
C(-1)	Coefficient	-------	0.000
	SE	-------	-0.019
	t-value	-------	-0.007
R-squared		0.077	0.566
Adj. R-squared		0.035	0.546
Akaike AIC		-4.716	1.338
Schwarz SC		-4.555	1.499
Mean dependent		0.013	0.008