THE ROLE OF TECHNICIANS AND FUNDAMENTALISTS IN THE CHINESE STOCK MARKET

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ABSTRACT

This paper provides empirical evidence on the role of fundamentalists and technicians in the Chinese stock market. An econometric model is used to differentiate between the effect on stock prices of the actions of traders who act on the basis of fundamental analysis and those who act on the basis of technical analysis. By estimating the model using the stock prices of eight companies listed on the Shanghai Stock Exchange, the results reveal that both fundamentalists and technicians play a role in stock price determination, although technicians appear to play a more important role. Some explanations are presented for the dominance of technicians.

INTRODUCTION

In this paper evidence is presented on the role played by fundamentalists and technicians in the Chinese stock market. The evidence is based on the model proposed by Moosa and Korczak (2000) and Moosa and Al-Loughani (2003), which follows, in part, the model proposed by Frankel and Froot (1990) to differentiate the roles played by fundamentalists and technicians in exchange rate determination. The proposed model is estimated and tested using time series data on the stock prices of eight Chinese companies covering two frequencies (daily and monthly) and various time periods.

The behaviour of traders who act on the basis of fundamental analysis and those who act on the basis of technical analysis may differ drastically. Fundamental analysts watch deviations from an equilibrium price, as implied by a fundamental model. If the current price is above its equilibrium level, the asset is sold, which should lead to a decline in the price. This is not necessarily the case, however. If, by watching charts or following quantitative technical indicators, technical analysts believe that there is no indication of a trend reversal, they will keep on buying the asset, lending support to the price. What happens to the price depends on the net effect of the forces of supply and demand resulting from the actions of fundamental analysts and technical analysts. The same argument is valid if the price falls below its equilibrium level.

Economists (who are essentially fundamentalists) have been studying technical analysis and the role of technicians with increasing enthusiasm, motivated by the desire to come up with an explanation for the deviation of financial prices from the values implied by the fundamental models of financial price determination. In studying technical analysis, economists seek to address three issues: (i) the extent to which technical analysis is used in practice to predict price movements; (ii) the forecasting power of technical models as opposed to fundamental models; and (iii) the role played by technicians in financial price determination. While it is concerned primarily with the third question, the empirical results presented in this paper should shed some light on the other two issues. If, for example, the results indicate that the actions of technicians are more powerful in determining financial prices, we may conclude that (i) technical analysis must be used extensively, and (ii) the forecasting power of technical models is superior to that of fundamental models.

THE EMPIRICAL EVIDENCE

Empirical evidence on the role played by fundamentalists and technicians in financial markets is provided by three kinds of studies: (i) those based on econometric models; (ii) those based on survey evidence; and (iii) those analyzing the comparative profitability of fundamental and technical trading rules.

One of the pioneering studies based on econometric modelling is that of Frankel and Froot (1990), who designed a model based on the same idea to explain the sharp rise in the demand for the dollar in the first half of the 1980s. On the basis of this model, they attributed the increase in the demand for the U.S. currency to the overwhelming role played by technical analysts during that period. The rise to glory of technical analysis is frequently attributed to the remarkable rise of the dollar between 1981 and 1985 to its highest level ever. The relentless appreciation of the dollar during that time period was unexplainable in terms of market fundamentals, such as interest rates and growth rates. Frustration with fundamental explanations of the dollar behaviour (and the consequent trading losses) led many analysts and investment managers to resort to technical analysis, a tendency that has created the *status quo* where technical analysis is taken seriously, even by anti-technical hardliners. The Frankel-Froot model was used by Vigfusson (1997), whereas Kirman (1991) presented an extension of the model. Levin (1997) developed a model involving the interaction between the expectations of chartists and fundamentalists.

By using a modified version of the Frankel-Froot model, Moosa and Korczak (2000) presented evidence indicating that (i) the exchange rate is determined by both technicians and fundamentalists, and (ii) fundamentalists play a bigger role in this respect. The second finding is justified on the grounds of using low-frequency data, which implies a long investment horizon. Moosa and Al-Loughani (2003) found some evidence indicating that the role of technicians is slightly more important than that of the fundamentalists. Variable addition tests revealed that the addition of the technicians' activity is more important than the addition of the fundamentalists' activity even though the coefficients on the variables representing the activities of fundamentalists and technicians turned out to be equal. Guest (2004) tested the same model using Australian spot and futures stock prices, producing evidence for the hypothesis that both fundamentalists and technicians play a role in price determination. Al-Muraikhi (2005) found similar results for the emerging stock and foreign exchange markets of Kuwait.

Survey evidence on the role played by fundamentalists and technicians is provided by a number of studies conducted on various markets. Harvey (1993, p 680) presents an interesting argument for survey evidence as an alternative to econometric modelling, stating that “more can be learned about the mysteries of international finance through understanding the propensities and proclivities of the traders than can be gleaned from a hundred multivariate regressions”. Allen and Taylor (1989, 1990) and Taylor and Allen (1992) surveyed more than 400 foreign exchange dealers in London, with 60 per cent saying that charts are at least as important as fundamental analysis. Cheung et al (2004) conducted a U.K.-based survey to find that technical-based trading was the preferred trading model. A later survey by Oberlechner (2001) incorporated the traders on all hierarchy levels in European foreign exchange markets, finding strong support for the use of technical analysis. Menkhoff (1997) and Lui and Mole (1998) obtained similar results from surveys conducted in the German and Hong Kong foreign exchange markets, respectively.

Evidence on the role played by fundamentalists and technicians is also provided by studies comparing of the profitability of fundamental and technical trading rules, as well as those studies stipulating heterogeneity in financial markets (see Moosa, 2003, pp 236-240). The general conclusion of these studies is that both fundamentalists and technicians play a role in financial markets and that financial markets participants are heterogenous with respect to the trading strategies they use. Pilbeam (1995a, 1995b) based his study of the profitability of foreign exchange trading on the notion of trader heterogeneity. In Pilbeam (1995b) traders are supposed to follow three different exchange rate determination models (the flexible-price monetary model, the sticky-price monetary model and the sticky-price portfolio balance model) in conjunction with six expectation formation mechanisms (static, extrapolative, adaptive, regressive, rational and heterogenous). In Pilbeam (1995a) traders are classified into chartists, fundamentalists and simpletons). The same idea forms the basis of the Post-Keynesian theory of exchange rate determination (see for example, Harvey, 1993).

Moosa (2002) presents a simple theoretical model that is based on the micro foundations of exchange rate determination to illustrate the relation between the heterogeneity of traders and volatility. The model is founded on the idea that observed exchange rate volatility can only result from erratic shifts in the market's excess demand function that is made up of the excess demand functions of heterogenous traders. The heterogeneity of traders means that they have different sentiments and different expectations at any point in time. Hence, they are likely to react differently to new developments: some want to buy (thus raising excess demand) and some want to sell (thus reducing excess demand). The net effect of their actions is to shift the aggregate excess demand function by a certain amount in a certain direction. In describing the model, Moosa assumes the presence of four kinds of traders: technicians using filter rules, technicians using moving average rules, fundamentalists using rules, and fundamentalists using discretion. This model was tested by Moosa and Shamsuddin (2003) who found that financial price formation results from the interaction of traders using a wide variety of technical and fundamental models.

MODEL SPECIFICATION

The specification of the model is derived from the following propositions. First, fundamentalists base their decisions (with respect to buying and selling stocks or financial assets in general) on the difference between the equilibrium price and the actual price. Hence, the current period's change in the price that is due to the operations of fundamentalists is given by

$$(\Delta p_t)^F = \alpha(\bar{p}_{t-1} - p_{t-1}) \tag{1}$$

where p is the logarithm of the price, a bar denotes the equilibrium price, F denotes fundamentalists and α is a positive parameter that reflects the speed of adjustment of the actual price to the deviation from the equilibrium price.

Technicians, on the other hand, base their decisions on previous changes in the price whether they use trading rules, follow quantitative technical indicators or simply observe charts. While there are a large number of specifications whereby this kind of behaviour can be represented, the choice falls on a geometrically-declining distributed lag representation as proposed by Moosa and Korczak (2000). This specification is related to the use of an exponential moving average rule, which is a technical trading rule (buying and selling on signals indicated by the points of intersection of the price and its exponential moving average). Hence, the change in the price due to the activities of the technicians can be represented by the equation

$$(\Delta p_t)^T = \sum_{i=1}^{\infty} \beta^i \Delta p_{t-i} \tag{2}$$

where $0 < \beta < 1$ and the superscript T denotes technicians. As in the Frankel-Froot model, the total change in price is a weighted average of the changes due to the activities of the fundamentalists and technicians, and vice versa. Hence

$$\Delta p_t = w(\Delta p_t)^T + (1 - w)(\Delta p_t)^F \tag{3}$$

In a testable stochastic form, the model can be written as

$$\Delta p_t = \gamma_0 + \gamma_1 (\bar{p}_{t-1} - p_{t-1}) + \gamma_2 \sum_{i=1}^{\infty} \beta^i \Delta p_{t-i} + \varepsilon_t \qquad (4)$$

such that $\gamma_0 = 0$, $\gamma_1 > 0$ and $\gamma_2 > 0$. If $\gamma_1 > \gamma_2$, we may safely conclude that fundamentalists play a more significant role in price determination, and vice versa.

MODEL ESTIMATION AND TESTING

Equation (4) is estimated by OLS, which is a valid procedure since the underlying variables are stationary. The unobserved equilibrium stock price, $\bar{p}$, is estimated by applying the Hodrick-Prescott (1997) filter to *p*. This is a detrending technique that is used to decompose an observed time series into trend and cycle. Formally, the HP filter is used to estimate the trend path $\{y_t^*, t = 1,2,\cdots,n\}$ of a time series $\{y_t, t = 1,2,\cdots,n\}$, subject to the constraint that the sum of the squared second differences of the time series is not too large. The trend is calculated from the observed time series by solving the optimisation problem

$$\min_{y_1^*, y_2^*, \cdots y_n^*} \left\{ \sum_{t=1}^{n} (y_t - y_t^*)^2 + \lambda \sum_{t=2}^{n-1} (\Delta y_{t+1}^*)^2 \right\} \qquad (5)$$

where the smoothing parameter, λ, is typically determined by the frequency of the observations. In essence, the equilibrium price is taken to be the fitted HP trend. Although the HP filter is not the only means whereby a proxy for the equilibrium price can be obtained, it is assumed here that the long-run trend of the price reflects the behaviour of the fundamental variables determining its equilibrium price. By using a specific fundamental model to estimate the equilibrium value, we run the risk of not capturing all of the fundamental variables, and hence the risk of misrepresenting the equilibrium price.

For estimating the geometrically-declining distributed lag, the choice of the value of the parameter β is arbitrary, but a value of 0.8 seems reasonable, because it means that the technicians assign more weight to more recent observations on Δp_{t-i}. As a robustness check, other values of the parameter were tried but made no qualitative difference to the results.

Following the estimation of the model, the importance of fundamentalists relative to technicians is determined by testing the null hypothesis

$$H_0 : \gamma_1 = \gamma_2 \qquad (6)$$

which amounts to a Wald test where the test statistic has a $\chi^2(1)$ distribution, since there is only one restriction on the values of the estimated coefficients. Also used are variable deletion tests as applied to equation (4). To find out if fundamentalists play a role in price determination, the coefficient restriction $\gamma_1 = 0$ is imposed. A significant test statistic in this case implies that the restriction is invalid, meaning that fundamentalists play a role in price determination (and vice versa). On the basis of the residual sum of squares of the unrestricted model (4) and the restricted model, two test statistics are calculated: a Lagrange multiplier (LM) test statistic and a likelihood ratio (LR) test statistic. Both of these test statistics follow a $\chi^2(1)$ distribution, since only one coefficient restriction is imposed. Likewise, the restriction $\gamma_2 = 0$ is imposed to find out if technicians play a role in price determination.

Non-nested model selection tests are used to find out if either technicians or fundamentalists can on their own determine stock prices. Consider the following two models, M1 and M2:

M1: $\Delta p_t = X\delta_1 + \xi_1$ (7)

M2: $\Delta p_t = Z\delta_2 + \xi_2$ (8)

where X is an observation matrix on the variable $(\bar{p}_{t-1} - p_{t-1})$, Z is an observation matrix on the variable $\Sigma\beta^i \Delta p_{t-i}$, δ_1 and δ_2 are unknown regression coefficient vectors, and ξ_1 and ξ_2 are disturbance vectors. The models M1 and M2 are said to be non-nested if the regressors of either of them cannot be expressed as an exact linear combination of the regressors of the other. Obviously, M1 and M2 are non-nested since the explanatory variables are different.

Six model selection tests are used: *N* is the Cox test derived in Pesaran (1974); *NT* is the adjusted Cox test derived in Godfrey and Pesaran (1983); *W* is the Wald-type test proposed by Godfrey and Pesaran (1983); *J* is the Davidson and MacKinnon (1981) test; *JA* is the Fisher-McAleer (1981) test; and *EN* is the encompassing test proposed, *inter alia*, by Mizon and Richard (1986). All of the test statistics have t distribution, except for the encompassing test that has F distribution. The tests are run both ways by testing M1 versus M2 and M2 versus M1. When M1 is tested versus M2, the null hypothesis is that M1 is a better model (in terms of specification) than M2. A significant test statistic indicates that M1 is not a better model than M2. When M2 is tested against M1, the null is that M2 is a better model than M1. A significant test statistic indicates that M2 is not a better model than M1. If we obtain significant test statistics both ways, this means that the two models are misspecified (that is, neither fundamentalists nor technicians can determine prices on their own). If we get insignificant test statistics by testing M1 versus M2 and insignificant statistics by testing M2 versus M1, this means that M1 is preferred to M2 (that is, fundamentalists alone determine stock prices). The econometrics of non-nested model selection tests can be found in Pesaran and Pesaran (1997).

DATA AND EMPIRICAL RESULTS

The empirical work conducted in this paper is based on daily and monthly data on the stock prices of eight listed companies. The data were obtained from the *Taiwan Economic Journal* database. Table 1 displays the sample periods and the corresponding number of observations for each time series.

The results of estimating equation (4) are reported in Table 2, including the estimated coefficients and their t statistics (in parentheses), as well as the coefficient of determination (R^2) and the diagnostics for serial correlation (*SC*), functional form (*FF*) and heteroscedasticity (*HS*), all of which have χ^2 distribution (with one degree of freedom for daily data and the same for monthly data, except for the serial correlation test statistics that has 12 degrees of freedom for monthly data). The estimated equations pass the diagnostic tests, producing significantly positive coefficients in all cases. The null hypothesis $H_{0:}\gamma_1 = \gamma_2$ is rejected in all cases, which means that although both have roles to play, technicians play a more important role in terms of exerting more influence on the market price.

Table 3 reports the results of the variable deletion tests. In all cases, both statistics are significant, which means that the null hypothesis is rejected, implying that both fundamentalists and technicians have roles to play and that neither technicians nor fundamentalists can determine prices on their own. These results are supported by the results of the non-nested model selection tests presented in Table 4. All of the test statistics are significant (both ways), implying that both M1 and M2 are misspecfied and that the correctly-specified model should include terms that represent the activities of fundamentalists and technicians. Overall, the results support the available survey and econometric evidence, which indicates that price determination in financial markets is a function of the activities of technicians and fundamentalists.

In seeking an explanation for the dominance of technicians in the Chinese stock market, one may resort to the key role played by the government, which determines how many companies can be listed each year and how many shares can be issued (Su and Fleisher, 1999). Moreover, significant proportions of the listed companies' holdings belong to the government directly and indirectly. Therefore, ordinary investors expect the government to be responsible for market performance. On the other hand, the government strives to achieve multiple objectives via the development of the stock market, such as improving government credibility, maintaining social stability and creating new jobs. This means that the behaviour of the market is independent from economic fundamentals and the performance of the real sector of the economy. Figure 1 confirms this observation, showing no trend in the market over the period 1997-2005, despite the fact that the Chinese economy was growing at double digits over this period.

Trading activity in the Chinese market is dominated by individual investors, because the shares controlled by government are not traded. However, Chinese individual investors lack investment knowledge and skill in general (because they have not been in this business for long). This characteristic results in the dominance of "noise traders", who are closer to be technicians, if anything at all. As De Long et al (1990) have shown, the behaviour of noise traders is typically unpredictable, and it can lead to a large divergence between market prices and fundamental values. Moreover, noise traders can survive for a long time and earn higher returns than sophisticated investors for bearing the extra risks created by them. Actually, some Chinese market anomalies can be explained by the behaviour of noising traders, including extensive speculation and excess volatility.

Some aspects of behavioural finance may also explain the dominance of technicians. The characteristics of the Chinese market provides fertile grounds for making investors overconfident in their judgements, which leads them to overestimate the precision of the information (Odean, 1998; Graham and Harvey, 2002). Moreover, these investors appear to judge uncertain events based on their experience, which may generate representiveness bias and lead to significant divergence of the market prices from the fundamental values of stocks. Confirmation bias and conservatism are also important. Confirmation bias exists when investors only believe information that supports their opinion and ignore information that does not. On the other hand, investors with conservatism bias have a relatively slow reaction to market changes because they may think that the new information is irrelevant and stick to what they believed previously. All of these phenomena seem to be thriving in the Chinese stock market (see, for example, Lin, 2005)

The Chinese corporate governance system may also explain the dominance of technicians. In China, the major shareholders are likely to be institutions and the state rather than individuals. Individual investors account for around 30 percent of total shares, and these shares are scattered over potentially many thousands of shareholders for each company (Hovey et al, 2003). In addition, it is very hard to find an individual shareholder on the board of directors, and it is believed that the interests of individual investors are not well protected. Therefore, Mok and Hui (1998) conclude that Chinese individual investor mainly look for the short-term capital speculation rather than long-term investment. This makes these investors more of technicians than fundamentalists.

CONCLUSION

This paper presented some evidence for the hypothesis that both technical traders and fundamental traders contribute to financial price determination in the Chinese stock market. Eight time series with two frequencies were used to test the underlying hypothesis, covering various time periods. Model estimation, as well as the results of non-nested model selection and variable deletion tests, showed that both fundamentalists and technicians have roles to play in stock price determination. These results support the established view and the available survey and econometric evidence on this issue. The dominance of technicians can be attributed to certain characteristics of the Chinese market, characteristics of the traders, and the Chinese corporate governance system.

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Table 1: The Data Samples

Company	Sector	From	To	Observations
Daily				
(1) Pu Dong Development Bank	Banking	10/11/1999	20/03/2006	1497
(2). Hainan Airline	Airlines	25/11/1999	22/06/2006	1555
(3) Zhu Jiang Shi Ye	Real Estate	01/03/1995	22/06/2006	2741
(4) Qing Dao Haier	Home Appliances	01/03/1995	31/03/2006	2697
(5) Bei Jing Xi Dan Market	Retailing	16/07/1996	22/06/2006	2364
(6) Star Group	Computing	08/08/1996	22/06/2006	2360
(7) Sanjing Pharmaceuticals	Pharmaceuticals	03/01/1995	22/06/2006	2727
(8) Changchun Gas	Energy	11/12/2000	22/06/2006	1320
Monthly				
(1) Pu Dong Development Bank	Banking	1999:11	2006:03	77
(2) Hainan Airline	Airlines	1999:11	2006:06	79
(3) Zhu Jiang Shi Ye	Real Estate	1993:10	2006:05	152
(4) Qing Dao Haier	Home Appliances	1993:11	2006:03	149
(5) Bei Jing Xi Dan Market	Retailing	1996:07	2006:05	119
(6) Star Group	Computing	1996:08	2006:05	118
(7) Sanjing Pharmaceuticals	Pharmaceuticals	1994:02	2006:05	148
(8) Changchun Gas	Energy	2000:12	2006:05	66

Table 2: Model Estimation Results*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Daily								
γ_0	0.003	0.0001	0.00009	-0.0004	0.00003	0.0003	-0.0005	0.0002
	(1.31)	(0.54)	(0.43)	(-1.72)	(0.11)	(1.06)	(-1.26)	(0.73)
γ_1	0.370	0.320	0.338	0.366	0.319	0.329	0.330	0.326
	(42.23)	(38.91)	(54.45)	(56.42)	(48.89)	(50.03)	(54.15)	(36.63)
γ_2	0.680	0.658	0.679	0.686	0.662	0.657	0.675	0.661
	(78.74)	(76.85)	(104.53)	(105.39)	(95.92)	(97.07)	(104.57)	(71.50)
R^2	0.84	0.82	0.83	0.84	0.82	0.83	0.83	0.82
SC	3.43	2.26	2.93	2.92	2.82	2.41	1.92	2.55
FF	1.45	0.57	0.07	1.96	0.01	0.002	3.37	3.24
HS	2.69	2.99	1.61	2.46	3.46	2.27	2.90	1.96
$H_{0:}\gamma_1 = \gamma_2$	678.4	881.9	1560.8	1300.9	1432.6	1315.5	1637.3	737.7
Monthly								
γ_0	0.004	0.0070	0.005	-0.002	0.001	0.005	-0.009	0.008
	1.18	1.41	1.55	-0.39	0.40	1.09	-2.75	1.56
γ_1	0.361	0.356	0.509	0.352	0.422	0.356	0.498	0.355
	10.11	8.68	19.32	11.93	14.07	11.33	17.08	8.32
γ_2	0.672	0.729	0.771	0.614	0.708	0.639	0.796	0.757
	18.68	19.28	31.81	22.91	26.42	21.44	30.13	1.87
R^2	0.85	0.85	0.90	0.82	0.88	0.83	0.89	0.84
SC	2.97	2.07	2.02	2.72	2.59	1.24	1.72	2.05
FF	0.18	2.10	1.11	1.79	0.24	1.61	2.03	0.29
HS	0.48	2.47	1.31	2.07	0.54	0.24	2.80	0.01
$H_{0:}\gamma_1 = \gamma_2$	42.2	47.4	53.2	43.2	55.5	45.5	54.9	44.6

* The numbers 1, …, 8 represent the companies listed in the same order as they appear in Table 1, such that 1 is Pu Dong Development Bank, and so on.

Table 3: Variable Deletion Test Results

Series	Tech Only LM: $\chi^2(1)$	Tech Only LR: $\chi^2(1)$	Fund Only LM: $\chi^2(1)$	Fund Only LR: $\chi^2(1)$
Daily				
(1) Pu Dong Development Bank	814.3	117.5	1205.7	2452.8
(2) Hainan Airline	767.8	1058.9	1230.8	2440.3
(3) Zhu Jiang Shi Ye	1424.9	2011.3	2191.2	4408.8
(4) Qing Dao Haier	1455.1	2099.2	2158.2	4390.5
(5) Bei Jing Xi Dan Market	1189.1	1653.2	1880.6	3754.6
(6) Star Group	1215.2	1707.6	1887.3	3797.3
(7) Sanjing Pharmaceuticals	1413.4	1992.2	2182.6	4396.3
(8) Changchun Gas	665.9	927.3	1049.0	2092.3
Monthly				
(1) Pu Dong Development Bank	44.4	66.6	62.9	133.4
(2) Hainan Airline	39.1	54.3	64.9	139.2
(3) Zhu Jiang Shi Ye	108.2	190.2	131.7	310.9
(4) Qing Dao Haier	73.4	101.3	115.9	226.5
(5) Bei Jing Xi Dan Market	74.6	118.2	101.3	230.9
(6) Star Group	61.9	88.3	93.8	189.1
(7) Sanjing Pharmaceuticals	98.4	162.8	126.9	292.4
(8) Changchun Gas	34.3	48.8	53.4	111.9

Table 4: Non-Nested Model Selection Test Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>Daily</u>								
<u>M1 vs M2</u>								
N	-936.5	-734.9	-1041.5	-1252.6	-846.3	-853.6	-955.30	-680.5
NT	-754.6	-636.5	-947.5	-1099.9	-775.2	-781.4	-879.7	-576.4
W	-472.6	-398.8	-593.6	-688.4	-485.8	-489.4	-550.8	-361.3
J	78.7	76.9	104.5	105.8	95.9	97.09	104.6	71.5
JA	-78.7	-76.9	-104.5	-105.8	-95.9	-97.09	-104.6	-71.5
EN	6200.5	5906.8	10927.7	11188.1	9200.3	9427.4	1093.8	5113.3
<u>M2 vs M1</u>								
N	-115.7	-63.8	-106.0	-153.3	-72.4	-77.2	-90.5	-62.4
NT	-112.4	-62.8	-104.9	-150.9	-71.7	-76.4	-89.7	-61.2
W	-103.5	-58.9	-97.6	-139.0	-67.4	-71.6	-83.8	-57.3
J	42.2	38.9	54.5	56.6	48.9	50.0	54.1	36.6
JA	-42.2	-38.9	-54.5	-56.6	-48.9	-50.0	-54.1	-36.6
EN	1783.6	1514.7	2965.6	3204.7	2390.7	2503.0	2932.2	1342.1
<u>Monthly</u>								
<u>M1 vs M2</u>								
N	-117.9	-293.6	-1278.0	-1856.9	-185.9	-258.6	-341.3	-222.5
NT	-53.5	-70.1	-151.0	-127.2	-90.9	-90.4	-142.4	-54.5
W	-33.7	-40.8	-92.2	-79.5	-55.2	-56.8	-84.3	-33.0
J	18.7	19.3	31.8	22.9	26.4	21.4	30.2	16.9
JA	-18.7	-19.3	31.8	-22.9	-26.4	-21.4	30.2	-16.9
EN	349.2	372.0	1012.4	524.8	698.8	459.8	908.3	284.8
<u>M2 vs M1</u>								
N	-11.1	-20.0	-311.0	-263.9	-18.5	-30.1	-76.6	-20.5
NT	-9.2	-14.0	-86.1	-52.4	-16.1	-22.5	-58.2	-13.4
W	-8.6	-13.2	-74.9	-47.9	-14.9	-20.9	-50.8	-12.5
J	10.1	8.7	19.3	11.9	14.1	11.3	17.1	8.3
JA	-10.1	-8.7	19.3	-11.9	-14.1	-11.3	17.1	-8.3
EN	102.3	75.4	373.6	142.5	198.0	128.5	291.9	69.3

Figure 1: The Shanghai Stock Price Index