

The magnet effect of price limits: Evidence from high-frequency data on the Stock  
Exchange of Thailand



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ผลกระทบจากการตั้งดูราคาหุ้นเมื่อราคาเคลื่อนเข้าใกล้ช่วงจำกัดการเปลี่ยนแปลงราคา  
ประจำวัน โดยใช้ข้อมูลราคาระหว่างวันจากบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย



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Commonly, daily prices limits are widely used for stabilizing stock markets and decrease volatility during overreaction period. However, regulators may not notice that instead of stopping panic sell or overbought, the daily price limits generate a magnet effect, which cause the price to accelerate to the price limits and increase the overall volatility. This research investigates the magnet effect of price limits using high frequency from the Stock Exchange of Thailand. Using AR(2)-GARCH(2,2) as a base model for each stock's 5-mins returns to capture the effect. The empirical results present evidence of the strong ceiling magnet effect at all conditions, while only some stock's characteristics find the evidence on the floor magnet effect. When combined volatility changes with the magnet effect, there is evidence to conclude an increase in volatility during price close to the price limits and after stock's price hit the price limit.

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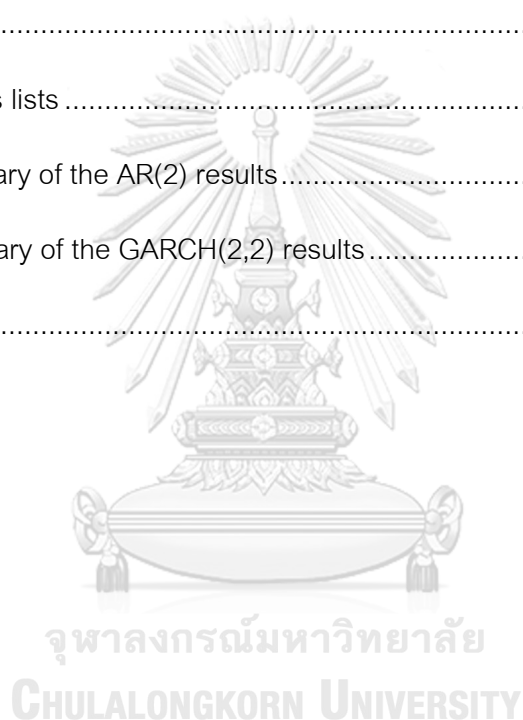
Wongwarit Boonyasitphawee



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# 1. Introduction

## 1.1. Background and Significance of the problem

Many stock markets around the world have the mechanism to stabilize markets during the hasty transaction period. The price limits and circuit breaker are the mechanisms which have been widely used in many countries such as Austria, Belgium, France, Greece, Italy, Netherland, Spain, Switzerland, and Turkey in Europe and China, Japan, India, Korea, Malaysia, Taiwan, and Thailand in Asia. The price limits and circuit breaker are exercised to provide a cooling-off period that allows traders to reevaluate information of individual stocks given drastic price changes, which cause prices to move beyond either ceilings or floors (Brennan 1986). In this way, impacts from investors' irrational decision, overreaction and price volatility could be significantly reduced to the extent that it does not interfere with the trading activity within trade days.

However, the price limits may have some opposite effects on stock markets as well. There are four empirical literatures conducting hypothesis tests on the price limits. Firstly, The Price Discovery Hypothesis indicates that the price limits would impede stock prices from adjusting to the fair price. Secondly, Volatility Spillover Hypothesis says that the volatility would increase on the next trading day upon hitting the price limits. Thirdly, Trading Interference Hypothesis, argues that after the price hit the limits, the market's liquidity would be lessened while the trading volume would be increased in the next trading day. Lastly, The Magnet Effect Hypothesis, which is also the primary concern in this paper, describing the phenomenon that traders would rush to trade when the price is close to limits as they are concerned about illiquidity. Many previous literatures focus on the first three hypotheses, which could be tested by daily open and close prices. In contrast, the magnet effect hypothesis could not be verified simply by price observation, since it requires high-frequency data to capture investors' behaviors which have shown even more complicated details and methods that make the literature on the magnet effect scarcity.

Motivated by the existing evidence of investors' trading behavior on testing the magnet effect, this research paper is conducting a research on Stock Exchange of

Thailand (SET) to investigate whether the price limits mechanism would lead to the magnet effect. The Stock Exchange of Thailand (SET) is considered the emerging market (EM) and it is one of the most capitalized markets in South-East Asia with sufficient trading liquidity and price volatility. Moreover, regarding the COVID-19 situation, which has caused the market's volatility to increase significantly, a much higher possibility for stocks to reach the price limits is hereby provided. As mentioned above are the reasons why Thailand stock market could be an intriguing data source to study.

To build a preliminary understanding of Stock Exchange of Thailand (SET), it was established in 1975 and by the end of June 2020, there are 601 listed stocks with the total market capitalization reaching 14.79 Trillion Baht. SET classifies companies into 8 industries and 28 sectors, as shown in Table 1.

**Table 1: Industries and sectors listed in Stock Exchange of Thailand**

This Table represents the group of industries and sectors in the Stock Exchange of Thailand.

	Industries	Sectors	
1	Agro & Food Industry (.AGRO)	AGRI	Agribusiness
		FOOD	Food & Beverage
2	Consumer Products (.CONSUMP)	FASHION	Fashion
		HOME	Home & Office Products
		PERSON	Personal Products & Pharmaceuticals
3	Financials (.FINCIAL)	BANK	Banking
		FIN	Finance & Securities
		INSUR	Insurance
4	Industrials (.INDUS)	AUTO	Automotive
		IMM	Industrial Materials & Machinery
		PAPER	Paper & Printing Materials
		PETRO	Petrochemicals & Chemicals
		PKG	Packaging
		STEEL	Steel

	Industries	Sectors	
5	Property&Construction (.PROPCON)	CONMAT	Construction Materials
		CONS	Construction Services
		PF&REITs	Property Fund & REITs
		PROP	Property Development
6	Resources (.RESOURC)	ENERG	Energy & Utilities
		MINE	Mining
7	Services (.SERVICE )	COMM	Commerce
		HEALTH	Health Care Services
		MEDIA	Media & Publishing
		PROF	Professional Services
		TOURISM	Tourism & Leisure
		TRANS	Transportation & Logistics
8	Technology (.TECH)	ETRON	Electronic Components
		ICT	Information & Communication Technology

The market trading hour is summarized in Table 2.

**Table 2: The Stock Exchange of Thailand trading hour**

This table represents the trading sessions of Stock exchange of Thailand

Time	Sessions
9:30 AM - 10:00 AM	Pre-opening I
10:00 AM - 12:30 PM	Morning Trading Session
12:30 PM - 2:00 PM	Intermission
2:00 PM - 2:30 PM	Pre-opening II
2:30 PM - 4:30 PM	Afternoon Trading Session
4:30 PM - 4:40 PM	Pre-close
4:40 PM - 5:00 PM	Off-Hour Trading

During Pre-opening I, Pre-opening II and Pre-close, traders are allowed to submit the orders, and the system will match them based on a Price-Time priority, and the maximum trading volume would be set as opening price for each trading session (closing price for a pre-close session). The price limits and trading halt of the Stock Exchange of Thailand are summarized in Table 3.

**Table 3: Stock Exchange of Thailand price limits**

This table represents both regular and temporary price limits of the Stock exchange of Thailand

	Normal Limits	Temporary Limits*
Ceiling Limits	30%	15%
Floor Limits	-30%	-15%

\*The temporary rule is effective during March 18<sup>th</sup>, 2020 to September 30<sup>th</sup>, 2020 to reduce price volatility under COVID-19 Situation

## 1.2. Research Objective

The research papers of empirical tests on the magnet effect are still scanty, while especially scholars in Thailand have no previous research about this effect as the price limits of the Stock Exchange of Thailand is set very high at  $\pm 30\%$  which lower the change that price will hit the limits. This paper will not only provide an empirical test on the magnet effect during the temporary rule of price limits which is set at  $\pm 15\%$  but also determine the effect of volatility change in both before and after the price hit the price limits.

The study will improve previous empirical research by using all stocks in Stock Exchange of Thailand that hit the price limits as a dataset to prevent selection bias. This study will also help investors and regulators understand more about the direct and indirect consequence of the price limits mechanism. This paper will illustrate how investors' trading behavior would correspond with the price limits.

### 1.3. Research Hypothesis and Conceptual Framework

#### Research Question 1:

Does the Stock Exchange of Thailand show evidence to support the magnet effect hypothesis?

#### Research Question 2:

When the stock price moves closer to the price limit, is there any change in the overall stock's volatility?

#### Research Question 3:

Is there any linkages between these stock's characteristics and the magnet effect?

From regulators view, the price limits are the mechanism to stabilize markets during overreaction in the stock market by providing a cooling-off period. This research aims to check the effect of setting the price limits. Rather than stop panic sell and overbought, the daily price limits may accelerate the price to reach the price limits and increase overall market volatility.

**Hypothesis 1:** The ceiling price limits have no evidence to support ceiling magnet hypothesis

**Hypothesis 2:** The floor price limits have no evidence to support ceiling magnet hypothesis

**Hypothesis 3:** After the price move closer to the price limits, the overall volatility remains the same

**Hypothesis 4:** Today conditional variance unchanged when yesterday price close at the price limits

These are null hypotheses to determine the magnet effect evidence and to detect the volatility change. This paper predicts that this effect exists in the Stock Exchange of Thailand and forecast that the volatility increases when the price hit the price limits. Therefore the paper expects to reject all null hypotheses. This paper believes that price movement is affected by fundamental factors such as different P/E, P/BV, Market capitalization, price range, etc. which varies across stocks. Then, the linkages between these stock's characteristics and the magnet effect will be identified, and there must be some group of stocks that show the statistical trend to support the magnet effect hypothesis.





## 2. Literature Reviews

### 2.1. Hypothesis Development

Some researchers argue that the price limits mechanism might impose opposite effects on stocks markets. There are four noticeable empirical literature tests on price limits. Firstly, **Delayed Price Discovery Effect**, thinks that the price limits would hinder prices from correctly reacting to the most recent information and reaching fair stock prices. (Lehmann 1989) found that the imbalance on demand and supply of trading would accelerate the current prices to reach their limits and consequently, on the next trading day, the stock prices would be immediately adjusted to the equilibrium price or fair price again.

Secondly, the **Volatility Spillover Effect** indicates that the price limits could stop price movement at the desired threshold on the trading day. However, on a subsequent day, the volatility spillover effect would hence increase the market volatility. (Kim and Rhee 1997) found that the market volatility does not return to normal after stock price hit the price limits on the next trading day. (Fama and Princes 1988) argues that price limits would increase volatility and has volatility spillover effect same as the circuit breaker. Even though the price limits do not halt the trading, it prevents the stock price from reaching the correct price.

Thirdly, **Trading Interference Effect**, (Lehmann 1989) has found that price limits could interfere with trading, whenever stock price reached the ceiling or floor limits because those stocks would be faced with lower liquidity and expected to experience a more intense trading volume on the next trading day. There is another evidence from the New York Stock Exchange, (Charles, Ready et al. 1994) suggesting that the volume and volatility tend to be higher than usual in the market following the circuit breaker enacted.

Lastly, **The Magnet Effect**, states that rather than generate a stabilizing effect on stock markets, the price limits may generate a magnet effect that accelerates the price movements toward the price limits (Subrahmanyam 1994). Whenever the price shifts close to the limits, investors may rush to trade at all prices where they could make to close their transaction immediately. The reason behind is that the panic selling psychology of traders fearing to lose the liquidity, and their orders might no longer be executed once the stock price reaches the limits, or the trading is halted.

This paper will focus on the magnet effect, as the literature in this hypothesis is scanty. This study will provide the extracted contributions by applying these studies to Thailand's stock market by using high-frequency trading data to capture the effect.

## 2.2. Previous empirical research on the price limits magnet effect

There is nearly absent of the previous empirical magnet effect research on both price limits and circuit breakers, some of which have shown different results of the effects in various countries. The main research that plays a crucial role in this paper and its methodology will follow (Cho, Russell et al. 2003). He found that the daily close price is not applicable for studying the magnet effect as it could not capture the intraday price movement, so the author used high-frequency data instead. Taiwan Stock Exchange set the price limits at only 7% for both upper and lower bounds which is a perfect condition to do the empirical test and investigate the magnet effect of price limits as it provides higher chances that price would reach the limits. The author use AR(3)-GARCH (2,2) model to capture the magnet effect. In the dataset, the stocks that hit the limits are used for the observation. As for the results, the author found that the ceiling magnet is statistically significant while that on the floor is not.

(Wong, Liu et al. 2009) where the author also followed (Cho, Russell et al. 2003) by using high-frequency data on the Shanghai Stock Exchange with AR(3)-GARCH(2,2) model to investigate the effect. The stocks that hit the limits with high liquidity (at least one transaction at every 5-minute interval) are used for observation in the dataset. For

the result, he found the floor magnet effect evidence, which prompts the price to reach the limits faster, and there is also a significant increase in both trading volume and volatility. The other literature on the magnet effect of price limits came from (Wong, Kong et al. 2020), the author using AR(3)-GARCH(2,2) followed (Cho, Russell et al. 2003) to investigate the effect. He used the four days intraday price from the Shanghai Stock Exchange during circuit breakers on 4 to 7 January 2016. For the results, he found the ceiling magnet effect after the circuit breaker is executed, and the magnet effect of trading halt is not only coexisted but also interact with the magnet of price limits.



### 3. Methodology

#### 3.1. Data Description

Typically, most stock markets set their daily price limits relatively high, which means that they would rarely reach the limits. For example, the Tokyo Stock Exchange set the daily price limits on average, at 20%, so that the probability for stocks to hit the limits will be theoretically low. On the contrary, the Taiwan Stock Exchange set the limits at 7%, giving rise to a relatively higher probability for stocks to hit the limits. Thailand is also setting the price limits high at  $\pm 30\%$ , calculated from the previous datasets of close prices for both ceiling prices and floor prices. Except for the first-day trade of IPO, when the price limits are set  $\pm 300\%$ . In some cases, where the company decide to distribute dividends, price limits could be adjusted by the value of dividend payments from the previous day (The day before XD). To be more specific, close prices prior to the dividend payment would still be used to calculate the new price limits, so that the price limits must remain fairly within  $\pm 30\%$  limits.

However, during COVID-19 situation, the Stock Exchange of Thailand (SET) has announced a temporary rule to reduce the market volatility. The temporary rule would be exercised during March 18<sup>th</sup>, 2020 to September 30<sup>th</sup>, 2020 to lower the price limits down to  $\pm 15\%$ , which is the lowest price limits Thailand stock market has ever seen over the past years. Given the high volatility of the Thai stock market, the numbers of observations must be sufficient during this period. In that case, this is a suitable time to study the magnet effect in Thailand stock market.

To testify the magnet effect, the daily price limits such as close prices and open prices could not be used to capture the effect as it is unable to capture the reaction of price movement when the price gets closer to the limits within a day. A high-frequency dataset is widely used to capture the intraday behavior of price movement, and to avoid selection bias as mentioned in above section, this paper uses an intraday 5-minute return of all stocks which price move closer within range 3% from price limits on Stock

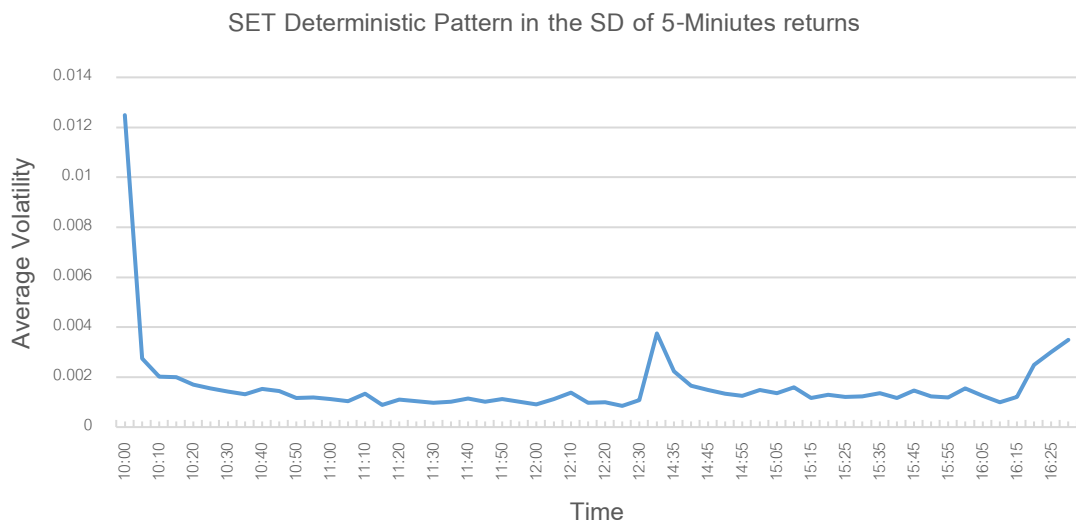
Exchange of Thailand during March 18<sup>th</sup>, 2020 to September 30<sup>th</sup>, 2020 to capture the magnet effect except for the stocks which have low liquidity (no transaction within an hour) and first day of IPO stocks which price limits is set differently.

### 3.2. The Model

The econometric model is used to capture the magnet effect of price limits. This paper follows (Cho, Russell et al. 2003) to use AR(n)-GARCH(p,q) model. The volatility can be defined as the standard deviation of 5-minutes returns. Normally, during the period when the market opens and closes, for both morning and afternoon sessions, the volatility tends to be higher than the rest of the day, which causes a deterministic volatility pattern of 5-minute return as shown in Figure 1.

Figure 1: The seasonal pattern of Intraday volatility

This figure represents a deterministic volatility pattern of 5-minute return



To avoid this problem, the first two and last two intervals each day must be disposed to remove the unusual volatility pattern. Then, the standardize 5-min return by its standard deviations for all stocks will be executed in order to eliminate the remaining unexpected volatility pattern by the following steps. Firstly, we compute the standard

deviation of each 5-minute interval for all individual stocks. To compute the model, the same time interval is applied to all observations, which are 52 five mins-intraday bins for each stock per day (10:10 – 16:20), the data range is 122 trading days in total which is 6,341 five mins-intraday. Then, the standard deviation of each 101 observations are computed as

$$\delta_k = \sqrt{\frac{\sum_{i=1}^{122} (r_{i,k} - \bar{r}_k)^2}{121}} \quad (1)$$

$$\bar{r}_k = \frac{\sum_{i=1}^{122} r_{i,k}}{121} \quad (2)$$

Where  $\delta_k$  is the sample standard deviation of return in interval k of return

$r_{i,k}$  is a return of stock in day i in the interval k

$\bar{r}_k$  is average of return in the interval k

Then, to remove the intraday volatility pattern, all 5-minute return intervals of each stock are divided by the standard deviation and shown as

$$\hat{r}_{i,k} = \frac{r_{i,k}}{\delta_k} \quad (3)$$

Where,  $\hat{r}_{i,k}$  is the standardized 5-minute return of each stock in day i in the interval k\*

Regularly, high-frequency stock returns exhibit autocorrelation patterns. After ran partial autocorrelation function (PACF) on the dataset, only half of them exhibit negative serial correlation up to third lag, but all of them are significant at second lag, AIC is also not much different between second lag and third lag. So, for the best fit to the model, AR(2) is used as cuts off and applied to all stocks in the dataset. and the AR(2) model becomes

$$\hat{r}_{i,k} = \alpha_0 + \alpha_1 \hat{r}_{i,k-1} + \alpha_2 \hat{r}_{i,k-2} + \gamma_1 D(\text{Ceiling})_{i,k-1} + \gamma_2 D(\text{Floor})_{i,k-1} + \epsilon_{i,k} \quad (4)$$

Where

$\gamma_1$  is a coefficient to captures ceiling magnet effect

$\gamma_2$  is a coefficient to captures floor magnet effect

$\epsilon_t$  is the conditional variance term

$D(\text{Ceiling})_t$  is the dummy variables which define as

$$D(\text{Ceiling})_t = \begin{cases} 1, & \text{If the price } P_t \text{ is within 3\% of ceiling} \\ 0, & \text{If the price } P_{t-1} \text{ and } P_{t-2} \text{ close at price limit} \\ 0, & \text{Otherwise} \end{cases} \quad (5)$$

$D(\text{Floor})_t$  is the dummy variables which define as

$$D(\text{Floor})_t = \begin{cases} 1, & \text{If the price } P_t \text{ is within 3\% of floor} \\ 0, & \text{If the price } P_{t-1}, P_{t-2} \text{ close at price limit} \\ 0, & \text{Otherwise} \end{cases} \quad (6)$$

Finance literature that study historical return always showed the volatility clustering evidence. The autoregressive and heteroskedasticity of the 5-minute returns are eliminated by using GARCH (2,2) model with some factors in conditional variance, and the model becomes

$$\sigma_{i,k}^2 = \beta_0 + \beta_1 \sigma_{i,k-1}^2 + \beta_2 \sigma_{i,k-2}^2 + \beta_3 \epsilon_{i,k-1}^2 + \beta_4 \epsilon_{i,k-2}^2 + \gamma_3 \{D(\text{Ceiling})_{i,k-1} + D(\text{Floor})_{i,k-1}\} + \gamma_4 DLIM_{i,k} \quad (7)$$

Where  $\gamma_3$  is a coefficient that captures volatility change as the price move close to the price limits

$\gamma_4$  is a coefficient that captures the volatility spillover hypothesis

DLIM is the dummy variable to capture the volatility spillover effect, which defines as

$$DLIM_t = \begin{cases} 1, & \text{If the previous trading day close at price limit} \\ 0, & \text{Otherwise} \end{cases} \quad (8)$$

#### 4. Empirical Results and Discussion

As described in the methodology session, the selection of AR() lag which is most fit with the stock's return data in SET must be choosed as a base model and applied to all stocks. After running partial autocorrelation function (PACF), the fittest lag has relied on second lag and third lag. However, not all stock's data fit on third lag, but all the stock's data fit on second lag, and AIC statistics from both lags are not much different. So that the AR(2) is applied to all observation as a base model in this paper.

After controlling the deterministic volatility pattern by using standardize return method, eliminating serial correlation and heteroskedasticity, AR(2)-GARCH(2,2) model is run to all individual stock's dataset. The four coefficients ( $\gamma_1, \gamma_2, \gamma_3$  and  $\gamma_4$ ) can be interpreted in different ways. Firstly,  $\gamma_1$  captures ceiling magnet effect, the positive  $\gamma_1$  coefficient implied that the price accelerates to the limits as it gets closer to the ceiling. Secondly,  $\gamma_2$  captures floor magnet effect, the negative  $\gamma_2$  implied that the price accelerates to the limits as it gets closer to the floor. Thirdly,  $\gamma_3$  captures volatility change, the positive  $\gamma_3$  coefficient implied that after the price move closer to the price limits, the overall volatility will increase.

If combine increasing in volatility with the magnet effect, it could support the magnet effect hypothesis as it increases the chance to draw a large absolute return and increase the probability that the price will reach the price limit. Lastly,  $\gamma_4$  captures the volatility spillover effect, the positive  $\gamma_4$  implied that if yesterday price close at the price limits, today volatility will increase as it prohibits the price from adjusting to reach its equilibrium price yesterday.

##### 4.1. Evidence of magnet effect on price limits in the Stock Exchange of Thailand

After applied Equation (5) and Equation (8) to the 101 SET stocks, the results of individual stocks are summarized in an Appendix (Table B and Table C) which reported in three different fields, estimated coefficients, Z- Score, and P-Value. The results show both significant and insignificant on individual stocks toward magnet effect, it is hard to conclude the significance of the overall magnet effect by comparing individual stock's



results. The median value for the P-value will provide a threshold how many coefficients are significant. For example, if P-Value median is less than or equal to 0.05, it implies that half of the observations are significant at 95% confident level. The overall statistics from 101 SET Stocks are shown in Table 4.

**Table 4: Summary statistics for the overall magnet effect in Stock Exchange of Thailand**  
This table represents the statistics of the overall magnet effect coefficients. D(Ceiling), D(Floor), D(Ceiling + Floor) and DLIM

	Number of Observation	Number of Significance	%Significance	Median of P-Value
D(Ceiling)	98	79	80.61%	0.0012**
D(Floor)	59	27	45.76%	0.0837
D(Ceiling + Floor))	101	73	72.28%	0.0000**
DLIM	93	54	58.06%	0.0041**

From the result, there are robust evidence on Ceiling magnet effect. There are 79 of the 98 stocks (80.61%) show a significant sign of P-Value on  $\gamma_1$ . The P-Value's median of ceiling magnet estimator is 0.0012 which implies that more than half of the ceiling estimators have a significant  $\gamma_1$  to reject the null hypothesis at 99% confidence level. However, there is not enough evidence to reject a null hypothesis on floor magnet effect as only 27 of the 59 stocks (45.76%) show a significant sign of P-Value  $\gamma_2$ . The P-Value's median of floor magnet estimator is 0.0837, which is considered a marginally significant. In other words, more than half of the floor estimators have a significant  $\gamma_2$  at only 90% confidence level, which is too weak evidence to support the floor magnet effect.

Next part is the result from the conditional variance model as shown in Table 4, the main focus coefficients are  $\gamma_3$  and  $\gamma_4$ . For  $\gamma_3$  which is a coefficient to determine the volatility change, there are 73 of the 101 (72.28%) with the P-Value's median of 0.000. Positive  $\gamma_3$  implies that the volatility increases when the price gets closer to the price limits. When combined the volatility change with the magnet effect as mentioned in  $\gamma_1$  and  $\gamma_2$ , this can imply that when the volatility increases, there is a higher probability of price reaching the limits and this evidence could support the magnet effect hypothesis.

To investigate the volatility spillover effect, the null hypothesis is that  $\gamma_4 = 0$ . A positive  $\gamma_4$  implies that a conditional variance increases when yesterday price close at the limits as the price is blocked by price limits to reach its equilibrium. Consequently, the today volatility is significantly high, which is an evidence to support the volatility spillover hypothesis. From the result, 68 from 93 (73.12%) have positive  $\gamma_4$  and the median of P-Value is 0.0041 which is very significant to support volatility hypothesis in SET.

#### 4.2. Linkage between magnet effect on price limits and the stock characteristic

The above session provides an overall of the magnet effect on price limits, which shows a very strong evidence on the ceiling magnet effect but weak evidence for the floor magnet effect. However, if observe on individual stocks level, there must be some characteristic that show the trend of magnet effect. This paper will classify stocks' characteristic into four criteria, Price to Earnings ratio (P/E), Price to Book value (P/BV), Market Capitalization, and Price-Range.

##### 4.2.1. Price to Earnings ratio (P/E Ratio)

Price to Earnings ratio is widely used to compare the value of the company's share price to its peers. P/E ratio is a ratio between the company's current price relative to its earning per share. The summarize and statistic from various P/E range are shown in Table 5

**Table 5: Summary statistics for the overall magnet effect classify by P/E ratio**

This table represents the statistics of the overall magnet effect classify by three P/E ratio range

P/E Ratio		<0 <sup>1</sup>	0-20	20+
$\gamma_1$ D(Ceiling)	Number of Significances	14	39	26
	Number of Observations	14	51	33
	Significant Observation %	100.00%	76.47%	78.79%
	Median of P-Value	0.000**	0.001**	0.004**
$\gamma_2$ D(Floor)	Number of Significances	7	12	8
	Number of Observations	10	28	21
	Significant Observation %	70.00%	42.86%	38.10%
	Median of P-Value	0.003**	0.089	0.127
$\gamma_3$ D(Ceiling + Floor)	Number of Significances	12	40	21
	Number of Observations	14	54	33
	Significant Observation %	85.71%	74.07%	63.64%
	Median of P-Value	0.000**	0.000**	0.001**
$\gamma_4$ DLIM	Number of Significances	7	29	18
	Number of Observations	13	48	32
	Significant Observation %	53.85%	60.42%	56.25%
	Median of P-Value	0.028*	0.000**	0.015*

<sup>1</sup>The stocks that have negative earning which cannot calculate P/E ratio

There is no change in the trend of ceiling magnet effect. They are statistically strong at all P/E range, confirming the ceiling magnet effect in Stock Exchange of Thailand. Especially on the negative P/E ratio stocks, it is an extremely strong ceiling magnet effect. All of stocks in this group are significant with the median P-Value of 0.000. On the other hand, most of the stocks are insignificant at positive P/E range, which is not enough evidence to confirm the Thai market's floor magnet effect.

Interestingly, there is strong evidence of floor magnet effect on negative P/E ratio stocks where 70% of stocks in this group are significant with the P-Value median of 0.003. Most of the stocks in this group are affected by the economic downturn during

COVID-19 pandemic, and they show a net loss in a financial statement. Consequently, stock's fundamental change, innumerable investors re-valuate the stock prices and react to the fair price immediately after the company's announcement, which cause panic to sell and drive the price down to the floor limits.

#### 4.2.2. Price to Book value (P/BV Ratio)

Price to Book value ratio is a ratio between the company's current price relative to its book value per share. Commonly, P/BV ratio is varying among the stock's industry, a good P/BV in one industry may worst in one industry. The summarize and statistic from various P/BV range are shown in Table 6.

**Table 6: Summary statistics for the overall magnet effect classify by P/BV ratio**

This table represents the statistics of the overall magnet effect classify by four P/BV ratio range

P/BV Ratio		<1	1-2	2-3	3+
$\gamma_1$ D(Ceiling)	Number of Significances	26	21	21	17
	Number of Observations	31	28	24	22
	Significant Observation %	83.87%	75.00%	87.50%	77.27%
	Median of P-Value	0.000**	0.004**	0.000**	0.005**
$\gamma_2$ D(Floor)	Number of Significances	11	8	4	6
	Number of Observations	17	15	16	17
	Significant Observation %	64.71%	53.33%	25.00%	35.29%
	Median of P-Value	0.006**	0.035*	0.125	0.156
$\gamma_3$ D(Ceiling + Floor)	Number of Significances	25	23	17	13
	Number of Observations	32	30	24	22
	Significant Observation %	78.13%	76.67%	70.83%	59.09%
	Median of P-Value	0.000**	0.000**	0.001**	0.009**
$\gamma_4$ DLIM	Number of Significances	23	15	13	9
	Number of Observations	32	26	23	22
	Significant Observation %	68.97%	57.69%	56.52%	40.91%
	Median of P-Value	0.000**	0.013*	0.000**	0.248

As could be expected, no change in the ceiling magnet effect trend, it very strong in all P/BV range. Not surprisingly, there is a P/BV pattern that can support floor magnet effect, most of the stocks which have negative P/E ratio are the member of <1 P/BV ratio group. The additional stocks are mostly come from financial and real estate where these sectors always trade at P/BV <0 but P/E still high. This implies that these two groups have the same characteristic during financial distress period. They have very high sensitivity to the economic condition. Whenever the stocks valuation change, investors will react to the change by rushing to sell the stock and when the price move closer to the floor price limits, investors will rush to trade at all price as they fear to lose their liquidity. This will cause the floor magnet effect which drives the price down to the floor limits with increasing volatility supported by the strong significance of  $\gamma_3$

#### 4.2.3. Market Capitalization

Market Capitalization refers to the total market value of a firm's outstanding stocks. It is calculated by multiplying the current stocks price by the total number of firm's share. According to (Fama and French 1996) they found that small-capitalization firms provide a higher return rate than large capitalization firms because small firms have a higher risk in both financial and liquidity risk. Besides, small-capitalization firms do not get exposure in the investment mainstream. They are not wildly attractive by investment analyst, which cause severe information asymmetry. Small firms have less information to valuate stock price than large capitalization firms, these reasons bring investors require higher rate of return to compensate the additional risk and the overall volatility must be higher than large capitalization firms. The summarize and statistic from three firm sizes are shown in Table 7.

**Table 7: Summary statistics for the overall magnet effect classify by market capitalization**

This table represents the statistics of the overall magnet effect classify by three firm size

Market Capitalization		Small <sup>1</sup>	Mid <sup>2</sup>	Large <sup>3</sup>
$\gamma_1$ D(Ceiling)	Number of Significances	47	17	15
	Number of Observations	54	24	20
	Significant Observation %	87.04%	70.83%	75.00%
	Median of P-Value	0.000**	0.004**	0.005**
$\gamma_2$ D(Floor)	Number of Significances	16	8	3
	Number of Observations	28	17	14
	Significant Observation %	57.14%	47.06%	21.43%
	Median of P-Value	0.028*	0.094	0.135
$\gamma_3$ D(Ceiling + Floor)	Number of Significances	40	18	15
	Number of Observations	56	25	20
	Significant Observation %	71.43%	72.00%	75.00%
	Median of P-Value	0.000**	0.000**	0.001**
$\gamma_4$ DLIM	Number of Significances	33	9	12
	Number of Observations	49	24	20
	Significant Observation %	67.35%	37.50%	60.00%
	Median of P-Value	0.000**	0.361	0.000**

<sup>1</sup> Small Capitalization(firm value < 10,000 MB) <sup>2</sup> Mid Capitalization (firm value) = 10,000 -50,000 MB <sup>3</sup> Large Capitalization (firm value) > 50,000 MB

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Ceiling magnet effect still very strong in all firm's size, especially in the small-capitalization firms which 87% of firms in the group are significant with the P-Value median of 0.000. In other words, more than half of the small-capitalization firm group show a strong ceiling magnet effect at 99% confidence level. However, there is no evidence to support floor magnet effect for mid and large capitalization firms while there is weak evidence for floor magnet effect in small capitalization firm. The results support Fama and French (1996) conclusion as volatility of small-capitalization stocks is higher than large-capitalization stocks, it will increase the probability of price reaching the prices limits

#### 4.2.4. Price Range

Normally, stocks that trade at a high price are mostly large corporations such as AOT, SCC, PTT, KBANK, BBL etc. These kinds of stocks are strong in financial status with sustainable growth and are considered “Safe” or “Blue Chips” company for making investment. Importantly, good stocks have a very high liquidity, it hard for investors to used small amount of money to change the stock price. While low price stocks are mostly the risky firms, these kinds of firms might not make profit for years and end up with bankruptcy. For trading volume, low price stocks are traded in small lots among investors that make these stocks illiquid. Any good or bad news can easily influent the stock price because if traders are trying to buy or sell stocks, they will raise their bids or lower their offer price to close their transaction.

In addition, low price stocks are cheap, so investors can buy a very large portion of stocks for a very little money. With low liquidity as mentioned above, it implies that a few investors with small amount of money are big enough to change the stock price up or down and the overall volatility must be significantly high when compared with expensive stocks with high liquidity. Moreover, tick size also affects the magnet effect as the price moving slots are different across the price range as shown in Table 8. Most low price stocks are traded at the price around 1 baht with a tick size of 0.01 baht, it mean that with 1 tick change, the return can change up to 1% and the price is easily accelerate to the price limits as there are only about 15 price slot to reach the ceiling price limit at 1.15 baht (15% from 1 baht).

These reasons made low price stocks have a tendency to be more volatile than high price stocks and increase the probability that price is reaching the ceiling or floor price limits which support the magnet effect hypothesis. The summarize and statistic from 5 price range are shown in Table 9.

**Table 8: Tick sizes**

This table represents the minimum price movement varies to each market price level prescribed by the Stock Exchange of Thailand (SET)

Price Range (Baht)	Tick Size (Baht)
<2	0.01
2-5	0.02
5-10	0.05
10-25	0.10
25-100	0.25
100-200	0.50
200-400	1.00
400+	2.00

**Table 9: Summary statistics for the overall magnet effect classify by price range**

This table represents the statistics of the overall magnet effect classify by five price range

Price Range		<2	2-5	5-10	10-25	25-100
$\gamma_1$ D(Ceiling)	Number of Significances	16	17	17	14	15
	Number of Observations	18	22	19	19	20
	Significant Observation %	88.89%	77.27%	89.47%	73.68%	75.00%
	Median of P-Value	0.000**	0.001**	0.000**	0.005**	0.006**
$\gamma_2$ D(Floor)	Number of Significances	7	5	4	6	5
	Number of Observations	9	12	8	18	12
	Significant Observation %	77.78%	41.67%	50.00%	33.33%	41.67%
	Median of P-Value	0.000**	0.295	0.070	0.125	0.077
$\gamma_3$ D(Ceiling + Floor)	Number of Significances	13	19	12	14	15
	Number of Observations	18	24	19	20	20
	Significant Observation %	72.22%	79.17%	63.16%	70.00%	75.00%
	Median of P-Value	0.000**	0.000**	0.003**	0.000**	0.001**
$\gamma_4$ DLIM	Number of Significances	11	14	9	11	9
	Number of Observations	16	21	16	20	20
	Significant Observation %	68.75%	66.67%	56.25%	55.00%	45.00%
	Median of P-Value	0.002**	0.000**	0.022*	0.007**	0.242



Most low-priced stocks in this research dataset are small firms that trade at low P/E, low P/BV. That is why low-price stocks should have the same stocks characteristic as mentioned stock group. 77.78% of stocks in this group are significant, and their Median of P-value is equal to 0.000. In other words, more than half of total observations are significant at 99% confidence level, which implies robust evidence on floor magnet effect. While ceiling magnet effect trend still unchanged at all price range.



## 5. Conclusion

This paper used high-frequency data on the Stock Exchange of Thailand (SET) to study the magnet effect of price limits. High-frequency data helps researchers capture the price movement and study the effect much better than using the daily close price. There are four noticeable empirical literature tests on the price limits: delayed price discovery effect, volatility spillover effect, trading interference effect and the magnet effect. This paper focused on the magnet effect evidence from SET. The SET regulation during COVID-19 situation is the perfect time to study the effect as SET has announced the temporary rule in order to reduce the volatility of the market. The temporary rule would be exercised to lower the price limits down to  $\pm 15\%$  for both upper and lower bound, which increase the probability for stocks to hit the price limits.

The magnet effect implies that the price limits may generate a magnet effect that accelerates the price movements toward the price limits. This paper used AR(2) – GARCH(2,2) model for each stocks' 5-mins returns to capture the effect. After conducted a formal test of the overall magnet effect from 101 stocks in the Stock exchange of Thailand, most of the stocks in the dataset were statistically significant, which can conclude the strong ceiling magnet effect in the Stock Exchange of Thailand. The evidence has shown that conditional mean returns and overall volatility increase when the price move closer to the ceiling price limits. There is also the volatility spillover evidence when yesterday price close at the price limits which affect the increase in overall volatility on the next trading day.

Since there was no evidence of floor magnet effect from overall statistic views as only 27 stocks from 59 stocks are significant to reject the null hypothesis. Then the more in-depth analysis in the individual stocks is computed to find the magnet effect evidence. The four stock's characteristics, P/E ratio, P/BV ratio, Market capitalization, and Price range were applied to see the individual stocks level trend. As could be expected, there are statistically significant in all criteria and sub-criteria in the ceiling

magnet effect which imply investors will rush to trade and close their transaction when the price gets closer to the ceiling price limits no matter that stocks are good or bad stocks. In contrast, there were some stock's characteristics that shows evidence to support floor magnet effect. They are mostly the stocks with a high sensitivity to the economic condition which have small-capitalization, negative to low P/E ratio, low P/BV ratio, and cheap price. These kinds of stocks are considered "risky" stocks. They are directly affected by the unexpected shock which impacted to firm's fundamental. The valuation of these stocks is immediately changed but there is no information widely public, uninformed and risk-averse stockholders will respond to the change by selling the shares at all price which cause panic sell. They fear to lose their liquidity when the price fall toward the floor limits. Consequently, the price is dumped to the floor price limits and the evidence of floor magnet effect in Stock Exchange of Thailand are shown in this stock's characteristic.

Regulators have claimed that daily price limits could stabilize markets during overreaction in the stock market by providing a cooling-off period. This could allow traders to reevaluate their trading decision. However, this research found empirical evidence for the magnet effect, which contradict the objective of price limits. Rather than stopping panic sell or overbought in the stock market, the daily price limits cause the price to accelerate to the limits, and the volatility is significantly increasing. Especially, for the ceiling price limit where all stocks provide strong evidence of price accelerate to the ceiling limit and for floor price limits where negative P/E, low P/BV, small market capitalization, and cheap price stocks have accelerated the price to the floor limits. This research summarizes that price limits on the Stock Exchange of Thailand are ineffective, not only to stop overbought when the price reaching ceiling price limits but also to stop panic selling distress stocks for floor price limits.

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## Appendix

**Table A : Stock's lists**

This table represents the details of stocks used in the dataset

	Symbol	Name	Industry	Sector	Average price	PBV	PE	Market Capitalization (MB)
1	AAV	Asia Aviation PCL	Services	Transport & Logistic	1.77	0.51	-	8,708.84
2	AEONTS	Aeon Thana Sinsap Thailand PCL	Financials	Finance & Securities	115.79	1.73	7.80	28,936.36
3	AI	Asian Insulators PCL	Resources	Energy & Utilities	1.26	1.38	7.30	3,453.67
4	AMANAHAH	Amanah Leasing PCL	Financials	Finance & Securities	2.60	1.95	9.84	2,635.77
5	ASIAN	Asian Sea Corporation PCL	Agro & Food Industry	Food & Beverage	6.79	1.22	14.35	3,638.69
6	ASP	Asia Plus Group Holdings PCL	Financials	Finance & Securities	1.61	0.73	11.43	3,407.14
7	AWC	Asset World Corp PCL	Property & Construct	Property Development	4.26	3.10	1,233.35	136,410.20
8	BAM	Bangkok Commercial Asset Management PCL	Financials	Finance & Securities	23.03	2.04	9.78	75,263.98
9	BANPU	Banpu PCL	Resources	Energy & Utilities	5.98	0.54	115.80	30,459.94
10	BBL	Bangkok Bank PCL	Financials	Banking	106.15	0.47	6.29	200,710.50
11	BCH	Bangkok Chain Hospital PCL	Services	Health Care Services	13.99	5.41	30.49	35,019.02
12	BCPG	BCPG PCL	Resources	Energy & Utilities	14.77	2.01	16.46	30,295.10
13	BEAUTY	Beauty Community PCL	Services	Commerce	1.57	5.27	66.26	4,716.96
14	BFIT	Srisawad Finance PCL	Financials	Finance & Securities	29.51	2.41	9.68	15,725.58
15	BGC	BG Container Glass PCL	Industrials	Packaging	10.06	1.38	13.23	6,798.92
16	BGRIM	BGrimm Power PCL	Resources	Energy & Utilities	47.30	6.22	54.79	125,694.10
17	CBG	Carabao Group PCL	Agro & Food Industry	Food & Beverage	95.44	11.21	32.01	96,090.91

	Symbol	Name	Industry	Sector	Average price	PBV	PE	Market Capitalization (MB)
18	CENTEL	Central Plaza Hotel PCL	Services	Tourism & Leisure	21.63	2.31	82.16	29,127.48
19	CCET	Cal-Comp Electronics Thailand PCL	Technology	Electronic Component	1.62	0.45	38.99	7,283.70
20	COL	COL PCL	Services	Commerce	14.48	1.37	14.87	9,129.31
21	CPN	Central Pattana PCL	Property & Construct	Property Development	48.07	3.26	17.13	214,470.20
22	CPW	Copperwired PCL	Services	Commerce	1.50	1.34	10.42	898.15
23	CSS	Communication & System Solution PCL	Services	Commerce	1.17	0.85	13.16	1,393.36
24	DELTA	Delta Electronics Thailand PCL	Technology	Electronic Component	68.19	2.44	22.38	80,614.87
25	DOHOME	Dohome PCL	Services	Commerce	9.39	2.60	27.33	20,028.89
26	EA	Energy Absolute PCL	Resources	Energy & Utilities	40.65	6.12	24.69	152,862.20
27	EKH	Ekachai Medical Care PCL	Services	Health Care Services	4.39	3.03	23.32	2,640.76
28	ESSO	Esso Thailand PCL	Resources	Energy & Utilities	6.19	1.50	-	21,702.10
29	GGC	Global Green Chemicals PCL	Industrials	Petrochem & Chemical	8.43	0.91	93.91	8,652.03
30	GLOBAL	Siam Global House PCL	Services	Commerce	15.49	3.96	31.26	67,528.72
31	GPSC	Global Power Synergy PCL	Resources	Energy & Utilities	68.34	2.00	31.36	197,336.20
32	HANA	Hana Microelectronics PCL	Technology	Electronic Component	31.03	1.14	13.66	24,263.80
33	HFT	Hwa Fong Rubber Thailand PCL	Industrials	Automotive	3.08	0.67	5.99	2,027.98
34	HMPRO	Home Product Center PCL	Services	Commerce	14.28	9.03	32.54	189,084.30
35	HTC	Haad Thip PCL	Agro & Food Industry	Food & Beverage	19.25	1.28	9.48	3,728.64
36	ICHI	Ichitan Group PCL	Agro & Food Industry	Food & Beverage	7.08	1.44	19.32	8,974.96
37	ILM	Index Living Mall PCL	Services	Commerce	11.35	1.14	10.71	5,800.16
38	INET	Internet Thailand PCL	Technology	Information&Comm Tech	2.41	0.63	8.93	1,200.74

	Symbol	Name	Industry	Sector	Average price	PBV	PE	Market Capitalization (MB)
39	IVL	Indorama Ventures PCL	Industrials	Petrochem & Chemical	25.72	1.12	114.80	147,320.70
40	JMART	Jay Mart PCL	Technology	Information&Comm Tech	10.16	2.73	18.49	9,082.90
41	JMT	JMT Network Services PCL	Financials	Finance & Securities	22.65	5.76	25.43	19,706.20
42	KBANK	Kasikornbank PCL	Financials	Banking	91.43	0.53	6.74	215,038.00
43	KCE	KCE Electronics PCL	Technology	Electronic Component	21.10	2.01	23.07	23,988.96
44	KSL	Khon Kaen Sugar Industry PCL	Agro & Food Industry	Food & Beverage	1.94	0.47	7.80	8,608.77
45	KTC	Krungthai Card PCL	Financials	Finance & Securities	32.11	3.96	14.96	82,499.66
46	LOXLEY	Loxley PCL	Services	Commerce	1.33	0.61	-	3,085.08
47	LPN	LPN Development PCL	Property & Construct	Property Development	4.47	0.54	5.82	6,535.43
48	M	MK Restaurant Group PCL	Agro & Food Industry	Food & Beverage	53.34	3.50	27.62	49,241.86
49	MAJOR	Major Cineplex Group PCL	Services	Media & Publishing	15.45	2.00	15.56	13,426.52
50	MALEE	Malee Group PCL	Agro & Food Industry	Food & Beverage	6.25	2.02	-	1,765.97
51	MBK	MBK PCL	Property & Construct	Property Development	14.09	0.97	7.95	23,659.58
52	MCOT	MCOT PCL	Services	Media & Publishing	5.54	1.64	-	3,789.91
53	MCS	MCS Steel PCL	Industrials	Steel	11.01	1.56	6.68	5,272.59
54	MONO	Mono Technology PCL	Services	Media & Publishing	2.30	5.31	-	8,304.34
55	MTC	Muangthai Capital PCL	Financials	Finance & Securities	49.41	5.91	22.76	103,330.70
56	NER	North East Rubbers PCL	Agro & Food Industry	Agribusiness	2.58	1.32	7.38	3,979.78
57	NEX	Nex Point PCL	Technology	Electronic Component	3.78	3.59	-	3,328.55
58	NOBLE	Noble Development PCL	Property & Construct	Property Development	12.31	0.98	2.42	5,477.86
59	NOK	Nok Airlines PCL	Services	Transport & Logistic	0.98	-	-	3,612.90

	Symbol	Name	Industry	Sector	Average price	PBV	PE	Market Capitalization (MB)
60	PLANB	Plan B Media PCL	Services	Media & Publishing	5.07	3.61	37.09	19,823.69
61	PLAT	Platinum Group PCL	Property & Construct	Property Development	2.76	0.87	17.73	7,765.67
62	PORT	Sahathai Terminal PCL	Services	Transport & Logistic	1.86	0.82	9.97	1,150.09
63	PSL	Precious Shipping PCL	Services	Transport & Logistic	4.48	0.62	-	7,036.94
64	PTL	Polplex Thailand PCL	Industrials	Packaging	16.65	1.13	7.15	14,941.64
65	RBF	R&B Food Supply PCL	Agro & Food Industry	Food & Beverage	6.98	3.61	31.73	13,962.18
66	S11	S 11 Group PCL	Financials	Finance & Securities	5.46	1.21	6.21	3,249.35
67	SAMART	Smart Corporation PCL	Technology	Information&Comm Tech	5.14	1.43	385.80	5,126.31
68	SAWAD	Srisawad Corporation PCL	Financials	Finance & Securities	51.40	3.54	17.10	68,852.43
69	SCB	Siam Commercial Bank PCL	Financials	Banking	71.69	0.61	6.15	242,545.50
70	SCI	SCI Electric PCL	Resources	Energy & Utilities	1.32	0.60	-	974.18
71	SINGER	Singer Thailand PCL	Services	Commerce	9.60	1.75	16.28	3,916.12
72	SIRI	Sansiri PCL	Property & Construct	Property Development	0.74	0.31	5.09	10,692.42
73	SIS	SIS Distribution Thailand PCL	Technology	Information&Comm Tech	8.87	1.20	6.27	3,005.82
74	SMPC	Sahamitr Pressure Container PCL	Industrials	Packaging	8.53	2.32	9.90	4,564.85
75	SMT	Stars Microelectronics Thailand PCL	Technology	Electronic Component	1.41	0.90	-	1,115.10
76	STA	Sri Trang Agro Industry PCL	Agro & Food Industry	Agribusiness	21.06	1.19	20.80	32,952.79
77	STARK	Stark Corporation PCL	Industrials	Ind Material&Machine	2.09	19.48	57.26	50,089.16
78	STPI	STP&I PCL	Property & Construct	Construction Services	4.31	0.86	20.68	7,079.49
79	SVI	SVI PCL	Technology	Electronic Component	2.85	1.77	12.33	6,103.37
80	SVOA	SVOA PCL	Technology	Information&Comm Tech	0.97	0.36	11.24	685.66



	Symbol	Name	Industry	Sector	Average price	PBV	PE	Market Capitalization (MB)
81	SYNEX	Synnex Thailand PCL	Technology	Information&Comm Tech	7.83	1.95	12.58	6,373.39
82	SYNTEC	Syntec Construction PCL	Property & Construct	Construction Services	1.41	0.41	7.94	2,268.42
83	TCMC	TCM Corporation PCL	Property & Construct	Construct	1.07	0.34	-	808.99
84	TFG	Thaifoods Group PCL	Agro & Food Industry	Food & Beverage	4.09	2.44	13.05	23,430.99
85	THAI	Thai Airways International PCL	Services	Transport & Logistic	4.21	0.56	-	9,406.36
86	THREL	Thaire Life Assurance PCL	Financials	Insurance	2.45	1.10	9.80	1,467.93
87	TKN	Taokaenoi Food & Marketing PCL	Agro & Food Industry	Food & Beverage	8.65	5.80	33.24	11,969.99
88	TKS	TKS Technologies PCL	Services	Media & Publishing	4.93	0.92	9.29	2,245.08
89	TOP	Thai Oil PCL	Resources	Energy & Utilities	40.79	0.79	9.40	84,410.79
90	TPOLY	Thai Polycons PCL	Property & Construct	Construction Services	1.86	0.64	17.59	1,053.51
91	TQM	TQM Corporation PCL	Financials	Insurance	100.94	41.57	60.97	30,910.23
92	TRUE	True Corporation PCL	Technology	Information&Comm Tech	3.36	1.31	26.64	113,591.40
93	TSR	Thiensurat PCL	Consumer Products	Home&Office Products	2.10	0.91	9.14	1,135.41
94	TTA	Thoresen Thai Agencies PCL	Services	Transport & Logistic	2.89	0.29	28.08	5,318.12
95	TTCL	TTCL PCL	Property & Construct	Construction Services	3.08	0.71	-	1,856.29
96	TVO	Thai Vegetable Oil PCL	Agro & Food Industry	Food & Beverage	26.32	2.30	13.47	21,065.42
97	ZEN	Zen Corporation Group PCL	Agro & Food Industry	Food & Beverage	8.57	1.93	83.56	2,565.68
98	UTP	United Paper PCL	Industrials	Paper&Print Material	10.73	2.07	7.22	6,909.50
99	VGI	VGI PCL	Services	Media & Publishing	7.03	4.52	78.10	61,100.13
100	WHA	WHA Corporation PCL	Property & Construct	Property Development	2.97	1.62	16.33	44,957.36
101	WICE	WICE Logistics PCL	Services	Transport & Logistic	2.90	2.30	19.75	1,842.15

Table B : Summary of the AR(2) results

The table shows AR(2) with magnet effect coefficients ( $\hat{\gamma}_{i,k} = \alpha_0 + \alpha_1 \hat{\gamma}_{i,k-1} + \alpha_2 \hat{\gamma}_{i,k-2} + \gamma_1 D(\text{Ceiling})_{i,k-1} + \gamma_2 D(\text{Floor})_{i,k-1} + \epsilon_{i,k}$ )

	Symbol	D(Ceiling) (z) (P> z )	D(Floor) (z) (P> z )	Alpha0 (z) (P> z )	Alpha1 (z) (P> z )	Alpha2 (z) (P> z )
1	AAV	0.729 (5.930) (0.000)	-0.359 (-1.702) (0.089)	-0.016 (-2.209) (0.027)	-0.361 (-27.501) (0.000)	-0.128 (-9.478) (0.000)
2	AEONTS	0.701 (1.264) (0.206)	-1.824 (-2.121) (0.034)	-0.016 (-1.790) (0.073)	-0.141 (-9.588) (0.000)	-0.064 (-4.637) (0.000)
3	AI	4.487 (18.209) (0.000)	-0.241 (-2.111) (0.035)	0.001 (0.172) (0.863)	-0.299 (-21.206) (0.000)	-0.133 (-9.285) (0.000)
4	AMANAH	0.668 (3.517) (0.000)	-0.532 (-0.978) (0.328)	-0.014 (-1.770) (0.077)	-0.283 (-20.448) (0.000)	-0.133 (-9.755) (0.000)
5	ASIAN	0.510 (3.783) (0.000)	N/A	0.000 (-0.024) (0.981)	-0.170 (-14.440) (0.000)	-0.049 (-3.656) (0.000)
6	ASP	1.599 (7.646) (0.000)	-0.109 (-0.602) (0.547)	-0.002 (-0.224) (0.823)	-0.336 (-26.536) (0.000)	-0.172 (-13.776) (0.000)
7	AWC	0.385 (3.271) (0.001)	-0.386 (-0.744) (0.457)	-0.015 (-2.066) (0.039)	-0.294 (-19.763) (0.000)	-0.110 (-8.572) (0.000)
8	BAM	0.893 (3.735) (0.000)	-0.668 (-1.818) (0.069)	-0.020 (-2.864) (0.004)	-0.342 (-24.460) (0.000)	-0.136 (-10.378) (0.000)
9	BANPU	0.301 (2.859) (0.004)	-0.278 (-1.525) (0.127)	-0.011 (-1.459) (0.145)	-0.426 (-29.249) (0.000)	-0.139 (-10.545) (0.000)
10	BBL	0.972 (1.599) (0.110)	N/A	0.000 (0.006) (0.995)	-0.314 (-21.465) (0.000)	-0.135 (-9.851) (0.000)
11	BCH	1.899 (0.711) (0.477)	-0.404 (-1.422) (0.155)	-0.003 (-0.368) (0.713)	-0.381 (-27.179) (0.000)	-0.121 (-8.936) (0.000)
12	BCPG	1.437 (4.175) (0.000)	-1.853 (-3.609) (0.000)	-0.010 (-1.382) (0.167)	-0.388 (-27.645) (0.000)	-0.171 (-13.214) (0.000)
13	BEAUTY	0.642 (3.724) (0.000)	-0.920 (-3.709) (0.000)	-0.019 (-2.355) (0.019)	-0.316 (-21.069) (0.000)	-0.114 (-8.602) (0.000)
14	BFIT	0.450 (3.223) (0.001)	-1.231 (-11.581) (0.000)	-0.010 (-1.236) (0.217)	-0.247 (-17.346) (0.000)	-0.116 (-8.602) (0.000)
15	BGC	2.406 (13.085) (0.000)	-0.299 (-0.819) (0.413)	-0.014 (-1.748) (0.081)	-0.183 (-12.722) (0.000)	-0.093 (-6.723) (0.000)
16	BGRIM	0.734 (1.997) (0.046)	-1.201 (-1.276) (0.202)	-0.006 (-0.739) (0.460)	-0.289 (-20.466) (0.000)	-0.110 (-8.266) (0.000)
17	CBG	0.991 (3.066) (0.002)	-2.306 (-1.581) (0.114)	-0.003 (-0.371) (0.710)	-0.195 (-13.396) (0.000)	-0.067 (-5.342) (0.000)
18	CENTEL	0.499 (3.818) (0.000)	-0.660 (-1.153) (0.249)	-0.016 (-1.782) (0.075)	-0.223 (-14.712) (0.000)	-0.069 (-5.298) (0.000)

	Symbol	D(Ceiling) (z) (P> z )	D(Floor) (z) (P> z )	Alpha0 (z) (P> z )	Alpha1 (z) (P> z )	Alpha2 (z) (P> z )
19	CCET	2.672 (4.596) (0.000)	N/A	-0.023 (-2.641) (0.008)	-0.170 (-11.856) (0.000)	-0.098 (-7.597) (0.000)
20	COL	0.005 (0.023) (0.982)	-1.066 (-2.457) (0.014)	-0.016 (-1.973) (0.049)	-0.198 (-12.737) (0.000)	-0.114 (-8.020) (0.000)
21	CPN	0.292 (1.740) (0.082)	-0.151 (-0.710) (0.477)	-0.004 (-0.462) (0.644)	-0.294 (-22.695) (0.000)	-0.097 (-7.578) (0.000)
22	CPW	0.692 (2.752) (0.006)	N/A	-0.020 (-2.368) (0.018)	-0.170 (-11.294) (0.000)	-0.100 (-6.796) (0.000)
23	CSS	1.067 (7.959) (0.000)	N/A	-0.015 (-1.720) (0.085)	-0.202 (-16.532) (0.000)	-0.105 (-7.873) (0.000)
24	DELTA	0.398 (3.291) (0.001)	N/A	0.004 (0.465) (0.642)	-0.170 (-11.175) (0.000)	-0.042 (-3.105) (0.002)
25	DOHOME	0.375 (3.691) (0.000)	-0.272 (-1.038) (0.299)	0.001 (0.134) (0.894)	-0.277 (-16.639) (0.000)	-0.120 (-8.449) (0.000)
26	EA	0.498 (1.063) (0.288)	-1.031 (-1.969) (0.049)	-0.007 (-0.925) (0.355)	-0.330 (-23.673) (0.000)	-0.121 (-9.523) (0.000)
27	EKH	0.404 (1.851) (0.064)	N/A	-0.007 (-0.948) (0.343)	-0.251 (-18.390) (0.000)	-0.102 (-7.311) (0.000)
28	ESSO	0.434 (3.611) (0.000)	-0.056 (-0.175) (0.861)	-0.010 (-1.227) (0.220)	-0.322 (-21.301) (0.000)	-0.125 (-9.676) (0.000)
29	GGC	0.342 (1.695) (0.090)	N/A	0.004 (0.526) (0.599)	-0.212 (-14.720) (0.000)	-0.102 (-7.220) (0.000)
30	GLOBAL	0.259 (1.279) (0.201)	-0.243 (-1.078) (0.281)	0.016 (2.044) (0.041)	-0.300 (-21.698) (0.000)	-0.113 (-8.983) (0.000)
31	GPSC	0.619 (3.903) (0.000)	-1.008 (-1.870) (0.062)	-0.010 (-1.230) (0.219)	-0.249 (-17.956) (0.000)	-0.088 (-6.439) (0.000)
32	HANA	0.668 (2.575) (0.010)	N/A	-0.009 (-1.121) (0.262)	-0.291 (-21.244) (0.000)	-0.087 (-6.541) (0.000)
33	HFT	N/A	0.016 (0.124) (0.901)	0.001 (0.102) (0.918)	-0.188 (-14.377) (0.000)	-0.122 (-9.617) (0.000)
34	HMPRO	0.319 (2.678) (0.007)	-0.023 (-0.093) (0.926)	-0.005 (-0.768) (0.443)	-0.392 (-30.043) (0.000)	-0.141 (-11.433) (0.000)
35	HTC	0.601 (3.625) (0.000)	N/A	-0.004 (-0.544) (0.586)	-0.255 (-18.043) (0.000)	-0.123 (-9.017) (0.000)
36	ICHI	1.781 (7.986) (0.000)	N/A	-0.002 (-0.190) (0.849)	-0.260 (-18.938) (0.000)	-0.098 (-7.132) (0.000)
37	ILM	0.734 (2.246) (0.025)	-0.539 (-0.562) (0.574)	-0.008 (-1.046) (0.295)	-0.275 (-19.166) (0.000)	-0.131 (-9.586) (0.000)
38	INET	0.884 (4.913) (0.000)	N/A	-0.005 (-0.591) (0.554)	-0.164 (-11.295) (0.000)	-0.083 (-6.534) (0.000)

	Symbol	D(Ceiling) (z) (P> z )	D(Floor) (z) (P> z )	Alpha0 (z) (P> z )	Alpha1 (z) (P> z )	Alpha2 (z) (P> z )
39	IVL	0.503 (3.132) (0.002)	-0.481 (-1.683) (0.092)	-0.013 (-1.792) (0.073)	-0.328 (-22.915) (0.000)	-0.121 (-9.736) (0.000)
40	JMART	1.373 (8.573) (0.000)	-0.424 (-1.729) (0.084)	0.006 (0.676) (0.499)	-0.259 (-18.472) (0.000)	-0.087 (-6.697) (0.000)
41	JMT	0.366 (2.387) (0.017)	-0.570 (-3.150) (0.002)	0.000 (0.014) (0.989)	-0.271 (-18.181) (0.000)	-0.111 (-8.344) (0.000)
42	KBANK	0.554 (3.769) (0.000)	-0.651 (-3.171) (0.002)	-0.017 (-2.115) (0.034)	-0.244 (-18.517) (0.000)	-0.096 (-7.013) (0.000)
43	KCE	0.506 (3.666) (0.000)	-0.307 (-1.082) (0.279)	-0.003 (-0.354) (0.724)	-0.261 (-19.356) (0.000)	-0.075 (-5.626) (0.000)
44	KSL	0.245 (0.460) (0.646)	N/A	-0.003 (-0.359) (0.720)	-0.283 (-19.114) (0.000)	-0.131 (-9.612) (0.000)
45	KTC	2.357 (4.096) (0.000)	-0.359 (-0.759) (0.448)	0.004 (0.601) (0.548)	-0.352 (-28.115) (0.000)	-0.149 (-12.272) (0.000)
46	LOXLEY	0.667 (5.335) (0.000)	N/A	-0.013 (-1.511) (0.131)	-0.211 (-15.118) (0.000)	-0.130 (-9.261) (0.000)
47	LPN	1.030 (3.861) (0.000)	-0.014 (-0.047) (0.963)	-0.001 (-0.192) (0.847)	-0.332 (-24.896) (0.000)	-0.129 (-9.940) (0.000)
48	M	0.834 (4.028) (0.000)	N/A	-0.014 (-1.789) (0.074)	-0.301 (-21.769) (0.000)	-0.110 (-7.733) (0.000)
49	MAJOR	1.610 (4.767) (0.000)	-0.447 (-1.673) (0.094)	-0.005 (-0.579) (0.562)	-0.308 (-21.918) (0.000)	-0.102 (-7.505) (0.000)
50	MALEE	1.083 (4.273) (0.000)	N/A	-0.009 (-0.944) (0.345)	-0.080 (-5.699) (0.000)	-0.069 (-5.480) (0.000)
51	MBK	2.992 (1.259) (0.208)	-1.769 (-2.926) (0.003)	-0.021 (-2.623) (0.009)	-0.313 (-22.389) (0.000)	-0.143 (-10.502) (0.000)
52	MCOT	3.289 (8.580) (0.000)	N/A	-0.038 (-5.653) (0.000)	-0.205 (-18.464) (0.000)	-0.099 (-7.550) (0.000)
53	MCS	1.217 (3.227) (0.001)	-4.101 (-3.189) (0.001)	0.002 (0.226) (0.821)	-0.301 (-20.360) (0.000)	-0.151 (-11.381) (0.000)
54	MONO	0.304 (2.189) (0.029)	N/A	-0.010 (-1.176) (0.240)	-0.248 (-16.405) (0.000)	-0.090 (-7.051) (0.000)
55	MTC	0.559 (3.127) (0.002)	-0.566 (-2.032) (0.042)	-0.009 (-1.062) (0.288)	-0.231 (-16.675) (0.000)	-0.085 (-6.139) (0.000)
56	NER	0.422 (2.476) (0.013)	N/A	-0.014 (-1.708) (0.088)	-0.325 (-21.528) (0.000)	-0.134 (-9.848) (0.000)
57	NEX	0.512 (3.615) (0.000)	-0.511 (-0.736) (0.462)	0.000 (-0.004) (0.996)	-0.151 (-10.439) (0.000)	-0.052 (-3.698) (0.000)
58	NOBLE	N/A	0.064 (0.599) (0.549)	-0.009 (-1.282) (0.200)	-0.393 (-26.466) (0.000)	-0.182 (-13.291) (0.000)

	Symbol	D(Ceiling) (z) (P> z )	D(Floor) (z) (P> z )	Alpha0 (z) (P> z )	Alpha1 (z) (P> z )	Alpha2 (z) (P> z )
59	NOK	0.264 (21.386) (0.000)	0.069 (6.278) (0.000)	0.000 (0.000) (1.000)	-0.300 (-26.028) (0.000)	-0.172 (-9.109) (0.000)
60	PLANB	0.472 (4.384) (0.000)	-0.565 (-4.561) (0.000)	-0.014 (-1.703) (0.089)	-0.289 (-21.176) (0.000)	-0.100 (-7.590) (0.000)
61	PLAT	0.897 (4.809) (0.000)	-0.404 (-1.123) (0.262)	-0.022 (-2.791) (0.005)	-0.235 (-16.061) (0.000)	-0.119 (-8.893) (0.000)
62	PORT	0.476 (2.535) (0.011)	N/A	-0.003 (-0.396) (0.692)	-0.202 (-13.394) (0.000)	-0.088 (-6.739) (0.000)
63	PSL	0.491 (4.275) (0.000)	-0.613 (-3.540) (0.000)	-0.019 (-2.344) (0.019)	-0.200 (-15.768) (0.000)	-0.072 (-5.764) (0.000)
64	PTL	0.168 (1.110) (0.267)	-4.147 (-18.480) (0.000)	0.012 (1.661) (0.097)	-0.293 (-20.335) (0.000)	-0.110 (-7.452) (0.000)
65	RBF	0.718 (7.042) (0.000)	-0.690 (-2.760) (0.006)	-0.003 (-0.323) (0.746)	-0.221 (-14.512) (0.000)	-0.054 (-3.942) (0.000)
66	S11	0.904 (2.709) (0.007)	-0.683 (-3.428) (0.001)	0.004 (0.479) (0.632)	-0.170 (-11.379) (0.000)	-0.103 (-7.554) (0.000)
67	SAMART	1.117 (3.003) (0.003)	N/A	-0.010 (-1.422) (0.155)	-0.201 (-13.418) (0.000)	-0.107 (-7.739) (0.000)
68	SAWAD	0.447 (2.345) (0.019)	-0.696 (-1.418) (0.156)	-0.016 (-1.937) (0.053)	-0.248 (-17.112) (0.000)	-0.092 (-6.830) (0.000)
69	SCB	0.412 (2.643) (0.008)	N/A	-0.012 (-1.479) (0.139)	-0.308 (-22.060) (0.000)	-0.129 (-9.571) (0.000)
70	SCI	0.517 (2.530) (0.011)	-0.574 (-2.249) (0.025)	-0.022 (-2.359) (0.018)	-0.123 (-7.659) (0.000)	-0.077 (-5.251) (0.000)
71	SINGER	0.425 (3.440) (0.001)	N/A	0.007 (0.844) (0.399)	-0.231 (-15.895) (0.000)	-0.080 (-5.604) (0.000)
72	SIRI	0.631 (1.061) (0.289)	N/A	-0.011 (-1.860) (0.063)	-0.531 (-39.573) (0.000)	-0.255 (-20.134) (0.000)
73	SIS	0.064 (0.184) (0.854)	N/A	-0.009 (-1.222) (0.222)	-0.254 (-16.980) (0.000)	-0.144 (-10.579) (0.000)
74	SMPC	1.113 (5.176) (0.000)	N/A	0.002 (0.200) (0.842)	-0.208 (-13.708) (0.000)	-0.106 (-7.918) (0.000)
75	SMT	0.843 (7.577) (0.000)	-11.491 (-18.202) (0.000)	-0.020 (-2.147) (0.032)	-0.112 (-7.915) (0.000)	-0.097 (-6.268) (0.000)
76	STA	0.342 (2.273) (0.023)	N/A	-0.004 (-0.536) (0.592)	-0.336 (-23.306) (0.000)	-0.135 (-9.850) (0.000)
77	STARK	0.612 (2.558) (0.011)	N/A	-0.027 (-4.067) (0.000)	-0.373 (-25.572) (0.000)	-0.192 (-13.716) (0.000)
78	STPI	0.372 (2.194) (0.028)	-0.014 (-2.156) (0.031)	-0.235 (-17.114) (0.000)	-0.093 (-7.350) (0.000)	-1.130 (-1.643) (0.100)

	Symbol	D(Ceiling) (z) (P> z )	D(Floor) (z) (P> z )	Alpha0 (z) (P> z )	Alpha1 (z) (P> z )	Alpha2 (z) (P> z )
79	SVI	1.912 (3.562) (0.000)	N/A	-0.009 (-1.025) (0.305)	-0.257 (-17.696) (0.000)	-0.079 (-5.385) (0.000)
80	SVOA	1.910 (9.020) (0.000)	N/A	-0.016 (-1.875) (0.061)	-0.186 (-12.654) (0.000)	-0.095 (-7.206) (0.000)
81	SYNEX	2.504 (4.070) (0.000)	N/A	0.000 (-0.050) (0.960)	-0.260 (-17.763) (0.000)	-0.111 (-8.381) (0.000)
82	SYNTEC	0.943 (6.169) (0.000)	N/A	-0.015 (-1.756) (0.079)	-0.228 (-16.413) (0.000)	-0.096 (-6.767) (0.000)
83	TCMC	0.657 (5.213) (0.000)	-2.087 (-7.361) (0.000)	-0.004 (-0.411) (0.681)	-0.197 (-14.270) (0.000)	-0.077 (-5.510) (0.000)
84	TFG	0.484 (1.169) (0.242)	N/A	-0.015 (-1.955) (0.051)	-0.286 (-19.578) (0.000)	-0.109 (-8.154) (0.000)
85	THAI	0.272 (4.183) (0.000)	-0.580 (-6.522) (0.000)	-0.014 (-1.887) (0.059)	-0.279 (-17.790) (0.000)	-0.098 (-7.360) (0.000)
86	THREL	0.538 (0.918) (0.359)	N/A	-0.015 (-1.855) (0.064)	-0.226 (-15.210) (0.000)	-0.122 (-8.271) (0.000)
87	TKN	0.789 (5.653) (0.000)	-0.689 (-1.128) (0.259)	-0.010 (-1.256) (0.209)	-0.282 (-22.220) (0.000)	-0.137 (-11.036) (0.000)
88	TKS	2.324 (3.757) (0.000)	1.305 (6.914) (0.000)	-0.013 (-1.621) (0.105)	-0.182 (-14.085) (0.000)	-0.087 (-7.087) (0.000)
89	TOP	0.645 (2.644) (0.008)	N/A	-0.004 (-0.475) (0.635)	-0.310 (-22.524) (0.000)	-0.113 (-8.503) (0.000)
90	TPOLY	0.342 (2.129) (0.033)	-0.755 (-5.066) (0.000)	-0.006 (-0.731) (0.465)	-0.144 (-9.305) (0.000)	-0.092 (-6.283) (0.000)
91	TQM	0.188 (1.254) (0.210)	N/A	-0.020 (-2.090) (0.037)	-0.150 (-9.322) (0.000)	-0.058 (-4.089) (0.000)
92	TRUE	0.514 (1.665) (0.096)	N/A	-0.012 (-1.685) (0.092)	-0.407 (-30.954) (0.000)	-0.178 (-14.326) (0.000)
93	TSR	0.146 (0.312) (0.755)	N/A	0.007 (0.799) (0.424)	-0.137 (-10.507) (0.000)	-0.078 (-5.707) (0.000)
94	TTA	0.406 (2.242) (0.025)	N/A	-0.013 (-1.491) (0.136)	-0.281 (-19.238) (0.000)	-0.110 (-8.513) (0.000)
95	TTCL	0.524 (3.957) (0.000)	-1.229 (-2.758) (0.006)	-0.026 (-2.618) (0.009)	-0.120 (-8.991) (0.000)	-0.070 (-4.779) (0.000)
96	TVO	0.480 (2.902) (0.004)	N/A	-0.005 (-0.834) (0.405)	-0.410 (-32.447) (0.000)	-0.181 (-13.737) (0.000)
97	ZEN	1.050 (2.426) (0.015)	-1.238 (-2.485) (0.013)	-0.003 (-0.392) (0.695)	-0.168 (-10.636) (0.000)	-0.082 (-5.965) (0.000)
98	UTP	0.603 (2.834) (0.005)	-1.820 (-0.969) (0.333)	0.002 (0.211) (0.833)	-0.311 (-24.186) (0.000)	-0.115 (-8.526) (0.000)

	Symbol	D(Ceiling) (z) (P> z )	D(Floor) (z) (P> z )	Alpha0 (z) (P> z )	Alpha1 (z) (P> z )	Alpha2 (z) (P> z )
99	VGI	0.377 (2.945) (0.003)	N/A	-0.012 (-1.531) (0.126)	-0.288 (-20.316) (0.000)	-0.105 (-7.985) (0.000)
100	WHA	N/A	-0.865 (-0.500) (0.617)	-0.004 (-0.549) (0.583)	-0.353 (-25.750) (0.000)	-0.155 (-12.558) (0.000)
101	WICE	0.540 (4.889) (0.000)	N/A	-0.004 (-0.497) (0.619)	-0.236 (-17.976) (0.000)	-0.088 (-6.730) (0.000)



Table C : Summary of the GARCH(2,2) results

The table shows the results from conditional variance model  $\sigma_{t,k}^2 = \beta_0 + \beta_1\sigma_{t,k-1}^2 + \beta_2\sigma_{t,k-2}^2 + \beta_3\varepsilon_{t,k-1}^2 + \beta_4\varepsilon_{t,k-2}^2 + \gamma_3\{D(Ceiling)_{t,k-1} + D(Floor)_{t,k-1}\} + \gamma_4DLLM_{t,k}$

	Symbol	D(Ceiling) +D(Floor) (z) (P> z )	DLLM (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
1	AAV	1.152 (3.510) (0.000)	0.333 (1.221) (0.222)	-2.530 (-32.681) (0.000)	0.086 (19.108) (0.000)	0.089 (21.716) (0.000)	-0.113 (-13.956) (0.000)	0.854 (99.502) (0.000)
2	AEONTS	2.618 (2.406) (0.016)	0.775 (0.917) (0.359)	-6.100 (-27.353) (0.000)	0.114 (14.266) (0.000)	-0.105 (-14.528) (0.000)	1.598 (34.951) (0.000)	-0.610 (-13.927) (0.000)
3	AI	-0.566 (-0.245) (0.806)	-604.815 (-3560.748) (0.000)	-7.219 (-27.749) (0.000)	0.098 (16.415) (0.000)	-0.097 (-16.394) (0.000)	1.675 (82.799) (0.000)	-0.678 (-34.103) (0.000)
4	AMANAHA	1.474 (6.271) (0.000)	0.465 (2.529) (0.011)	-1.727 (-18.923) (0.000)	0.078 (11.216) (0.000)	0.098 (15.395) (0.000)	-0.088 (-3.018) (0.003)	0.718 (26.480) (0.000)
5	ASIAN	0.937 (2.513) (0.012)	1.516 (12.724) (0.000)	-3.523 (-57.809) (0.000)	0.054 (22.794) (0.000)	0.060 (23.724) (0.000)	-0.058 (-19.457) (0.000)	0.920 (270.339) (0.000)
6	ASP	2.168 (10.145) (0.000)	-0.722 (-0.661) (0.508)	-3.244 (-27.082) (0.000)	0.055 (11.969) (0.000)	0.011 (2.624) (0.009)	0.009 (0.538) (0.591)	0.880 (59.222) (0.000)
7	AWC	-33.613 (-31.978) (0.000)	1.401 (3.381) (0.001)	-4.973 (-27.911) (0.000)	0.120 (10.834) (0.000)	-0.084 (-7.233) (0.000)	1.004 (11.679) (0.000)	-0.047 (-0.575) (0.565)
8	BAM	0.252 (0.118) (0.906)	2.051 (4.890) (0.000)	-7.078 (-29.602) (0.000)	0.087 (10.285) (0.000)	-0.083 (-10.405) (0.000)	1.678 (37.986) (0.000)	-0.684 (-15.859) (0.000)
9	BANPU	-303.055 (-1841.468) (0.000)	-0.030 (-0.206) (0.837)	-3.298 (-9.202) (0.000)	0.095 (10.129) (0.000)	-0.059 (-4.223) (0.000)	1.006 (4.769) (0.000)	-0.084 (-0.448) (0.654)
10	BBL	3.328 (4.261) (0.000)	-544.785 (-3300.898) (0.000)	-6.253 (-20.569) (0.000)	0.117 (11.150) (0.000)	-0.108 (-10.712) (0.000)	1.422 (19.596) (0.000)	-0.433 (-6.147) (0.000)
11	BCH	2.690 (0.520) (0.603)	0.948 (0.239) (0.811)	-7.054 (-21.756) (0.000)	0.092 (9.733) (0.000)	-0.085 (-9.541) (0.000)	1.465 (19.658) (0.000)	-0.473 (-6.475) (0.000)
12	BCPG	4.182 (8.744) (0.000)	1.024 (0.774) (0.439)	-5.866 (-20.741) (0.000)	0.102 (10.455) (0.000)	-0.093 (-9.898) (0.000)	1.215 (12.534) (0.000)	-0.227 (-2.389) (0.017)
13	BEAUTY	0.986 (0.473) (0.636)	-810.242 (-6554.039) (0.000)	-7.158 (-30.307) (0.000)	0.109 (10.897) (0.000)	-0.105 (-10.783) (0.000)	1.454 (26.037) (0.000)	-0.458 (-8.281) (0.000)
14	BFIT	-2.454 (-0.386) (0.700)	1.213 (6.494) (0.000)	-6.049 (-24.058) (0.000)	0.088 (11.585) (0.000)	-0.085 (-11.595) (0.000)	1.624 (35.390) (0.000)	-0.630 (-14.063) (0.000)



	Symbol	D(Ceiling) +D(Floor) (z) (P> z )	D(LIM) (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
15	BGC	4.034 (5.489) (0.000)	0.122 (0.019) (0.985)	-7.958 (-31.100) (0.000)	0.098 (13.094) (0.000)	-0.094 (-12.952) (0.000)	1.636 (51.017) (0.000)	-0.640 (-20.331) (0.000)
16	BGRIM	2.787 (3.130) (0.002)	0.057 (0.047) (0.963)	-6.186 (-18.243) (0.000)	0.077 (7.779) (0.000)	-0.070 (-7.465) (0.000)	1.433 (13.409) (0.000)	-0.442 (-4.227) (0.000)
17	CBG	3.581 (7.362) (0.000)	0.045 (0.110) (0.912)	-3.835 (-32.006) (0.000)	0.112 (10.231) (0.000)	-0.059 (-4.682) (0.000)	0.643 (6.917) (0.000)	0.280 (3.235) (0.001)
18	CENTEL	-106.826 (-429.166) (0.000)	1.367 (5.538) (0.000)	-4.505 (-23.985) (0.000)	0.147 (11.963) (0.000)	-0.119 (-10.080) (0.000)	1.181 (15.764) (0.000)	-0.221 (-3.176) (0.001)
19	CCET	3.589 (14.092) (0.000)	1.477 (12.541) (0.000)	-2.183 (-24.833) (0.000)	0.069 (14.129) (0.000)	0.024 (2.890) (0.004)	0.122 (1.564) (0.118)	0.655 (9.947) (0.000)
20	COL	-161.727 (-549.859) (0.000)	-0.505 (-1.579) (0.114)	-4.531 (-26.356) (0.000)	0.087 (11.573) (0.000)	-0.069 (-9.695) (0.000)	1.252 (15.656) (0.000)	-0.282 (-3.724) (0.000)
21	CPN	2.882 (9.329) (0.000)	1.086 (1.389) (0.165)	-8.402 (-20.709) (0.000)	0.033 (7.018) (0.000)	-0.032 (-7.084) (0.000)	1.894 (79.938) (0.000)	-0.895 (-38.226) (0.000)
22	CPW	1.642 (10.003) (0.000)	0.723 (10.030) (0.000)	-1.362 (-13.950) (0.000)	0.136 (19.717) (0.000)	0.093 (3.899) (0.000)	-0.027 (-0.159) (0.873)	0.535 (4.168) (0.000)
23	CSS	-0.700 (-0.527) (0.598)	1.053 (7.336) (0.000)	-2.876 (-37.449) (0.000)	0.044 (19.718) (0.000)	0.045 (19.866) (0.000)	-0.066 (-7.201) (0.000)	0.916 (95.334) (0.000)
24	DELTA	0.366 (1.245) (0.213)	0.915 (5.761) (0.000)	-3.415 (-16.425) (0.000)	0.146 (14.733) (0.000)	-0.095 (-8.209) (0.000)	1.132 (11.164) (0.000)	-0.217 (-2.524) (0.012)
25	DOHOME	-0.777 (-1.271) (0.204)	1.121 (13.923) (0.000)	-3.070 (-14.022) (0.000)	0.136 (11.737) (0.000)	-0.102 (-8.357) (0.000)	0.978 (9.744) (0.000)	-0.058 (-0.669) (0.503)
26	EA	1.861 (0.763) (0.446)	0.859 (0.996) (0.319)	-6.074 (-13.769) (0.000)	0.070 (6.023) (0.000)	-0.059 (-5.162) (0.000)	1.030 (5.718) (0.000)	-0.043 (-0.243) (0.808)
27	EKH	2.959 (11.565) (0.000)	-0.505 (-0.141) (0.888)	-6.337 (-22.665) (0.000)	0.075 (10.014) (0.000)	-0.070 (-10.115) (0.000)	1.670 (33.882) (0.000)	-0.677 (-14.217) (0.000)
28	ESSO	0.995 (2.933) (0.003)	0.131 (0.628) (0.530)	-3.922 (-21.548) (0.000)	0.140 (12.376) (0.000)	-0.113 (-10.303) (0.000)	0.983 (12.042) (0.000)	-0.032 (-0.421) (0.674)
29	GGC	1.800 (3.383) (0.001)	-611.601 (-4329.680) (0.000)	-5.620 (-26.017) (0.000)	0.097 (12.687) (0.000)	-0.087 (-12.976) (0.000)	1.599 (30.484) (0.000)	-0.613 (-12.329) (0.000)
30	GLOBAL	-879.936 (-6095.889) (0.000)	2.873 (19.168) (0.000)	-4.060 (-17.496) (0.000)	0.075 (7.071) (0.000)	-0.025 (-1.575) (0.115)	0.667 (3.076) (0.002)	0.262 (1.289) (0.197)
31	GPSC	2.088 (2.689) (0.007)	-0.317 (-0.220) (0.826)	-6.236 (-24.199) (0.000)	0.070 (7.049) (0.000)	-0.063 (-6.708) (0.000)	1.514 (20.306) (0.000)	-0.524 (-7.176) (0.000)

	Symbol	D(Ceiling) +D(Floor) (z) (P> z )	D(LIM) (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
32	HANA	1.769 (6.140) (0.000)	0.066 (0.358) (0.720)	-1.932 (-12.734) (0.000)	0.063 (10.477) (0.000)	0.057 (5.205) (0.000)	-0.049 (-0.345) (0.730)	0.772 (6.363) (0.000)
33	HFT	0.660 (2.085) (0.037)	1.697 (19.812) (0.000)	-2.352 (-40.701) (0.000)	0.047 (18.250) (0.000)	0.049 (20.810) (0.000)	-0.080 (-6.555) (0.000)	0.884 (73.170) (0.000)
34	HMPRO	-1.111 (-0.153) (0.879)	1.774 (4.738) (0.000)	-5.262 (-17.440) (0.000)	0.043 (4.302) (0.000)	-0.017 (-1.416) (0.157)	0.373 (1.966) (0.049)	0.595 (3.204) (0.001)
35	HTC	2.919 (18.162) (0.000)	-217.272 (-762.861) (0.000)	-7.295 (-40.569) (0.000)	0.071 (13.933) (0.000)	-0.068 (-14.407) (0.000)	1.770 (75.007) (0.000)	-0.774 (-33.683) (0.000)
36	IOHI	0.046 (0.003) (0.998)	0.870 (1.776) (0.076)	-7.105 (-31.122) (0.000)	0.072 (10.189) (0.000)	-0.069 (-10.208) (0.000)	1.743 (57.906) (0.000)	-0.747 (-25.281) (0.000)
37	ILM	2.212 (14.952) (0.000)	0.810 (7.020) (0.000)	-1.011 (-18.429) (0.000)	0.121 (15.788) (0.000)	0.107 (15.319) (0.000)	-0.212 (-15.181) (0.000)	0.580 (20.137) (0.000)
38	INET	2.173 (4.060) (0.000)	-1.453 (-1.094) (0.274)	-4.830 (-58.314) (0.000)	0.096 (13.338) (0.000)	-0.074 (-10.288) (0.000)	0.844 (17.864) (0.000)	0.126 (2.754) (0.006)
39	IVL	-311.466 (-1204.757) (0.000)	1.849 (3.669) (0.000)	-6.237 (-24.438) (0.000)	0.115 (10.609) (0.000)	-0.086 (-7.548) (0.000)	0.753 (8.821) (0.000)	0.216 (2.598) (0.009)
40	JMART	1.099 (2.434) (0.015)	0.447 (4.062) (0.000)	-2.753 (-15.638) (0.000)	0.078 (7.566) (0.000)	0.004 (0.251) (0.802)	0.308 (1.759) (0.079)	0.540 (3.479) (0.001)
41	JMT	2.363 (5.413) (0.000)	0.812 (1.348) (0.178)	-6.478 (-26.544) (0.000)	0.127 (12.623) (0.000)	-0.120 (-12.194) (0.000)	1.287 (17.498) (0.000)	-0.297 (-4.099) (0.000)
42	KBANK	3.473 (7.576) (0.000)	1.873 (2.995) (0.003)	-8.939 (-34.078) (0.000)	0.064 (12.506) (0.000)	-0.063 (-12.548) (0.000)	1.863 (137.501) (0.000)	-0.863 (-64.218) (0.000)
43	KCE	1.079 (4.197) (0.000)	0.054 (0.292) (0.770)	-2.609 (-24.354) (0.000)	0.051 (10.287) (0.000)	0.042 (8.530) (0.000)	-0.060 (-3.067) (0.002)	0.888 (48.090) (0.000)
44	KSL	2.323 (7.011) (0.000)	N/A	-4.115 (-17.117) (0.000)	0.116 (12.068) (0.000)	-0.093 (-10.649) (0.000)	1.285 (15.293) (0.000)	-0.325 (-4.243) (0.000)
45	KTC	3.638 (4.079) (0.000)	-0.280 (-0.310) (0.757)	-4.230 (-19.729) (0.000)	0.022 (5.798) (0.000)	0.025 (3.750) (0.000)	0.088 (0.289) (0.772)	0.848 (2.882) (0.004)
46	LOXLEY	2.221 (2.612) (0.009)	0.665 (0.975) (0.329)	-6.598 (-50.713) (0.000)	0.086 (13.504) (0.000)	-0.082 (-13.160) (0.000)	1.502 (53.777) (0.000)	-0.508 (-18.463) (0.000)
47	LPN	2.842 (18.714) (0.000)	-0.219 (-1.427) (0.154)	-3.055 (-29.754) (0.000)	0.089 (13.438) (0.000)	0.033 (2.672) (0.008)	0.106 (1.127) (0.260)	0.718 (8.399) (0.000)
48	M	-885.546 (-6264.625) (0.000)	-0.130 (-0.075) (0.941)	-7.232 (-22.395) (0.000)	0.077 (12.468) (0.000)	-0.075 (-12.536) (0.000)	1.756 (62.126) (0.000)	-0.759 (-27.456) (0.000)

	Symbol	D(Ceiling) +D(Floor) (z) (P> z )	DLIM (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
49	MAJOR	3.353 (6.281) (0.000)	1.058 (1.410) (0.159)	-8.200 (-24.338) (0.000)	0.095 (10.501) (0.000)	-0.094 (-10.531) (0.000)	1.686 (52.313) (0.000)	-0.688 (-21.456) (0.000)
50	MALEE	2.624 (16.596) (0.000)	0.197 (0.362) (0.717)	-2.713 (-44.241) (0.000)	0.083 (15.677) (0.000)	-0.005 (-0.723) (0.470)	0.253 (4.198) (0.000)	0.598 (10.960) (0.000)
51	MBK	4.731 (15.104) (0.000)	-0.861 (-0.646) (0.518)	-6.136 (-26.531) (0.000)	0.072 (8.886) (0.000)	-0.069 (-8.859) (0.000)	1.610 (33.428) (0.000)	-0.615 (-12.994) (0.000)
52	MCOT	5.508 (38.752) (0.000)	N/A	-4.545 (-106.731) (0.000)	0.035 (34.870) (0.000)	0.036 (37.966) (0.000)	-0.035 (-40.538) (0.000)	0.956 (954.835) (0.000)
53	MCS	-0.223 (-0.032) (0.974)	1.268 (8.470) (0.000)	-2.498 (-16.287) (0.000)	0.138 (12.153) (0.000)	-0.029 (-1.558) (0.119)	0.501 (3.842) (0.000)	0.293 (2.749) (0.006)
54	MONO	0.262 (0.489) (0.625)	0.006 (0.024) (0.981)	-2.183 (-16.436) (0.000)	0.143 (15.057) (0.000)	-0.024 (-1.295) (0.195)	0.528 (4.160) (0.000)	0.238 (2.367) (0.018)
55	MTC	2.202 (6.290) (0.000)	1.376 (4.613) (0.000)	-6.418 (-29.619) (0.000)	0.081 (8.806) (0.000)	-0.076 (-8.790) (0.000)	1.546 (20.486) (0.000)	-0.553 (-7.450) (0.000)
56	NER	1.359 (1.270) (0.204)	1.453 (8.967) (0.000)	-5.897 (-24.377) (0.000)	0.111 (15.938) (0.000)	-0.106 (-15.345) (0.000)	1.352 (21.344) (0.000)	-0.361 (-5.806) (0.000)
57	NEX	2.187 (25.564) (0.000)	0.073 (0.693) (0.488)	-2.369 (-67.172) (0.000)	0.139 (33.847) (0.000)	0.132 (31.314) (0.000)	-0.156 (-27.841) (0.000)	0.807 (318.906) (0.000)
58	NOBLE	-0.325 (-0.331) (0.741)	0.541 (1.427) (0.154)	-3.451 (-19.727) (0.000)	0.140 (11.187) (0.000)	-0.098 (-7.787) (0.000)	0.811 (10.932) (0.000)	0.111 (1.677) (0.094)
59	NOK	17.057 (152.288) (0.000)	-19.644 (0.000)	-1.600 (-156.056) (0.000)	0.314 (36.943) (0.000)	0.597 (29.382) (0.000)	0.000 (2.176) (0.030)	0.373 (147.585) (0.000)
60	PLANB	-0.998 (-1.309) (0.190)	0.535 (3.876) (0.000)	-1.969 (-16.252) (0.000)	0.065 (11.775) (0.000)	0.058 (9.709) (0.000)	-0.114 (-4.455) (0.000)	0.839 (38.332) (0.000)
61	PLAT	2.098 (13.825) (0.000)	-0.518 (-6.504) (0.000)	-1.782 (-19.090) (0.000)	0.105 (13.469) (0.000)	0.057 (3.393) (0.001)	0.066 (0.494) (0.621)	0.594 (5.538) (0.000)
62	PORT	0.012 (0.007) (0.994)	0.288 (1.154) (0.249)	-3.425 (-38.376) (0.000)	0.128 (15.534) (0.000)	-0.079 (-8.926) (0.000)	0.755 (13.866) (0.000)	0.162 (3.276) (0.001)
63	PSL	2.466 (4.955) (0.000)	0.896 (2.196) (0.028)	-5.112 (-26.843) (0.000)	0.042 (11.224) (0.000)	0.028 (5.988) (0.000)	0.002 (0.065) (0.948)	0.923 (39.902) (0.000)
64	PTL	2.375 (6.391) (0.000)	2.294 (14.184) (0.000)	-6.493 (-31.136) (0.000)	0.123 (16.740) (0.000)	-0.120 (-16.898) (0.000)	1.682 (77.131) (0.000)	-0.687 (-32.385) (0.000)
65	RBF	0.996 (1.261) (0.207)	0.487 (0.910) (0.363)	-5.428 (-31.702) (0.000)	0.149 (14.125) (0.000)	-0.133 (-13.402) (0.000)	1.309 (23.482) (0.000)	-0.329 (-6.141) (0.000)

	Symbol	D(Ceiling) +D(Floor) (z) (P> z )	D(LIM) (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
66	SI1	2.009 (12.438) (0.000)	0.994 (7.324) (0.000)	-2.122 (-32.044) (0.000)	0.104 (18.025) (0.000)	0.015 (2.126) (0.034)	0.096 (2.526) (0.012)	0.656 (21.684) (0.000)
67	SAMART	4.205 (1.830) (0.067)	N/A	-7.249 (-37.155) (0.000)	0.093 (15.957) (0.000)	-0.081 (-15.425) (0.000)	1.492 (23.495) (0.000)	-0.505 (-8.199) (0.000)
68	SAWAD	1.436 (2.411) (0.016)	1.540 (6.411) (0.000)	-5.938 (-24.691) (0.000)	0.099 (8.292) (0.000)	-0.092 (-8.056) (0.000)	1.411 (20.128) (0.000)	-0.421 (-6.153) (0.000)
69	SCB	1.300 (2.124) (0.034)	-289.853 (-1805.784) (0.000)	-6.477 (-22.122) (0.000)	0.097 (9.414) (0.000)	-0.092 (-9.333) (0.000)	1.476 (22.101) (0.000)	-0.483 (-7.362) (0.000)
70	SCI	1.686 (7.590) (0.000)	0.428 (2.870) (0.004)	-4.267 (-27.991) (0.000)	0.113 (16.087) (0.000)	-0.100 (-15.289) (0.000)	1.383 (29.715) (0.000)	-0.411 (-9.540) (0.000)
71	SINGER	0.386 (0.569) (0.569)	0.645 (2.708) (0.007)	-4.653 (-25.139) (0.000)	0.132 (14.401) (0.000)	-0.114 (-13.430) (0.000)	1.398 (26.064) (0.000)	-0.426 (-8.592) (0.000)
72	SIRI	2.118 (3.732) (0.000)	-0.682 (-2.231) (0.026)	-1.521 (-6.406) (0.000)	0.064 (4.794) (0.000)	0.034 (1.594) (0.111)	0.008 (0.034) (0.973)	0.616 (3.463) (0.001)
73	SIS	3.529 (8.925) (0.000)	N/A	-7.608 (-43.388) (0.000)	0.120 (15.935) (0.000)	-0.117 (-15.733) (0.000)	1.527 (51.348) (0.000)	-0.531 (-18.013) (0.000)
74	SMPC	1.299 (3.246) (0.001)	1.277 (7.548) (0.000)	-2.676 (-17.920) (0.000)	0.122 (11.982) (0.000)	-0.018 (-0.902) (0.367)	0.537 (3.534) (0.000)	0.285 (2.213) (0.027)
75	SMT	1.277 (8.309) (0.000)	-0.110 (-2.194) (0.028)	-1.701 (-43.720) (0.000)	0.078 (21.353) (0.000)	0.082 (23.254) (0.000)	-0.094 (-3.995) (0.000)	0.748 (36.929) (0.000)
76	STA	-589.012 (-4427.561) (0.000)	0.615 (2.438) (0.015)	-5.324 (-15.414) (0.000)	0.097 (9.230) (0.000)	-0.088 (-8.810) (0.000)	1.536 (21.976) (0.000)	-0.550 (-8.284) (0.000)
77	STARK	2.951 (7.189) (0.000)	1.492 (5.943) (0.000)	-5.752 (-22.848) (0.000)	0.098 (11.090) (0.000)	-0.092 (-11.699) (0.000)	1.653 (36.603) (0.000)	-0.663 (-15.403) (0.000)
78	STPI	-0.135 (-2.375) (0.018)	-2.160 (-45.522) (0.000)	0.084 (23.247) (0.000)	0.087 (24.652) (0.000)	-0.144 (-27.082) (0.000)	0.849 (169.484) (0.000)	0.775 (14.016) (0.000)
79	SVI	1.790 (5.048) (0.000)	1.255 (14.616) (0.000)	-1.076 (-16.788) (0.000)	0.105 (13.075) (0.000)	0.100 (11.534) (0.000)	-0.117 (-2.489) (0.013)	0.532 (14.464) (0.000)
80	SVOA	1.394 (4.235) (0.000)	-0.162 (-1.479) (0.139)	-2.021 (-32.676) (0.000)	0.081 (18.960) (0.000)	0.033 (7.866) (0.000)	-0.038 (-2.620) (0.009)	0.788 (60.363) (0.000)
81	SYNEX	4.351 (9.019) (0.000)	-1.372 (-0.274) (0.784)	-5.327 (-29.039) (0.000)	0.142 (16.418) (0.000)	-0.129 (-16.177) (0.000)	1.461 (37.771) (0.000)	-0.479 (-13.095) (0.000)
82	SYNTEC	-30.976 (-68.865) (0.000)	N/A	-7.585 (-28.080) (0.000)	0.074 (12.524) (0.000)	-0.071 (-12.597) (0.000)	1.717 (56.389) (0.000)	-0.720 (-24.017) (0.000)

	Symbol	D(Ceiling) +D(Floor) (z) (P> z )	DLIM (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
83	TCMC	1.072 (6.933) (0.000)	0.400 (4.602) (0.000)	-1.822 (-38.315) (0.000)	0.067 (21.307) (0.000)	0.073 (24.118) (0.000)	-0.144 (-20.948) (0.000)	0.824 (131.738) (0.000)
84	TFG	3.912 (8.487) (0.000)	N/A	-5.645 (-25.627) (0.000)	0.101 (10.447) (0.000)	-0.086 (-9.504) (0.000)	1.196 (11.976) (0.000)	-0.214 (-2.209) (0.027)
85	THAI	-0.257 (-0.495) (0.621)	0.227 (6.064) (0.000)	-3.663 (-24.814) (0.000)	0.164 (14.580) (0.000)	-0.088 (-7.025) (0.000)	1.042 (9.805) (0.000)	-0.139 (-1.499) (0.134)
86	THREL	3.339 (8.145) (0.000)	N/A	-4.663 (-24.295) (0.000)	0.124 (15.654) (0.000)	-0.111 (-15.041) (0.000)	1.343 (25.483) (0.000)	-0.366 (-7.365) (0.000)
87	TKN	0.632 (0.826) (0.409)	-0.074 (-0.418) (0.676)	-3.118 (-22.878) (0.000)	0.051 (12.697) (0.000)	0.021 (5.213) (0.000)	-0.040 (-5.719) (0.000)	0.921 (141.014) (0.000)
88	TKS	-703.641 (-5828.265) (0.000)	2.235 (7.181) (0.000)	-3.654 (-69.138) (0.000)	0.058 (15.425) (0.000)	0.019 (3.722) (0.000)	0.122 (2.073) (0.038)	0.775 (14.016) (0.000)
89	TOP	-17.589 (-0.001) (0.999)	0.975 (0.887) (0.375)	-6.443 (-11.832) (0.000)	0.047 (4.793) (0.000)	-0.041 (-4.716) (0.000)	1.554 (9.552) (0.000)	-0.562 (-3.528) (0.000)
90	TPOLY	-1.083 (-0.220) (0.826)	1.403 (16.696) (0.000)	-5.173 (-66.095) (0.000)	0.133 (18.994) (0.000)	-0.116 (-17.568) (0.000)	1.320 (39.162) (0.000)	-0.343 (-10.571) (0.000)
91	TQM	-0.118 (-0.072) (0.943)	0.400 (0.406) (0.685)	-5.533 (-36.004) (0.000)	0.150 (15.419) (0.000)	-0.138 (-14.751) (0.000)	1.351 (34.900) (0.000)	-0.368 (-9.862) (0.000)
92	TRUE	3.107 (10.564) (0.000)	0.491 (1.002) (0.316)	-3.451 (-19.292) (0.000)	0.045 (7.396) (0.000)	0.006 (0.631) (0.528)	0.143 (1.191) (0.234)	0.767 (6.759) (0.000)
93	TSR	1.126 (1.528) (0.127)	N/A	-2.284 (-52.082) (0.000)	0.045 (26.270) (0.000)	0.042 (25.959) (0.000)	-0.090 (-26.041) (0.000)	0.899 (244.307) (0.000)
94	TTA	0.302 (0.530) (0.596)	0.899 (4.574) (0.000)	-2.982 (-17.686) (0.000)	0.126 (12.354) (0.000)	-0.082 (-7.054) (0.000)	0.797 (8.153) (0.000)	0.104 (1.192) (0.233)
95	TTCL	0.725 (3.142) (0.002)	0.863 (11.205) (0.000)	-1.487 (-28.145) (0.000)	0.096 (15.514) (0.000)	0.120 (19.606) (0.000)	-0.056 (-1.468) (0.142)	0.607 (20.836) (0.000)
96	TVO	5.015 (3.252) (0.001)	-618.076 (-1015.524) (0.000)	-11.798 (-8.567) (0.000)	0.054 (10.735) (0.000)	-0.053 (-10.783) (0.000)	1.893 (141.391) (0.000)	-0.893 (-67.384) (0.000)
97	ZEN	2.823 (6.381) (0.000)	0.640 (2.076) (0.038)	-4.798 (-43.282) (0.000)	0.108 (16.393) (0.000)	-0.090 (-14.338) (0.000)	1.158 (17.995) (0.000)	-0.184 (-2.969) (0.003)
98	UTP	0.844 (1.021) (0.307)	1.206 (6.449) (0.000)	-2.792 (-34.192) (0.000)	0.071 (24.652) (0.000)	0.069 (21.198) (0.000)	-0.097 (-10.165) (0.000)	0.891 (124.244) (0.000)
99	VGI	1.726 (2.222) (0.026)	1.717 (4.695) (0.000)	-7.558 (-22.958) (0.000)	0.081 (9.856) (0.000)	-0.078 (-9.834) (0.000)	1.661 (34.987) (0.000)	-0.663 (-14.123) (0.000)

	Symbol	D(Ceiling) + D(Floor) (z) (P> z )	D LIM (z) (P> z )	Beta0 (z) (P> z )	Beta1 (z) (P> z )	Beta2 (z) (P> z )	Beta3 (z) (P> z )	Beta4 (z) (P> z )
100	WHA	3.779 (6.207) (0.000)	0.470 (0.567) (0.571)	-3.344 (-26.795) (0.000)	0.078 (14.552) (0.000)	-0.005 (-0.893) (0.372)	0.049 (2.344) (0.019)	0.838 (42.397) (0.000)
101	WICE	0.728 (2.023) (0.043)	0.651 (8.354) (0.000)	-2.786 (-34.500) (0.000)	0.084 (16.980) (0.000)	0.020 (4.019) (0.000)	0.024 (1.156) (0.248)	0.806 (47.637) (0.000)



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