

DO INSTITUTIONAL INVESTORS IMPROVE INFORMATIONAL EFFICIENCY OF STOCK PRICES?

NHÀ ĐẦU TƯ TỔ CHỨC CÓ GIÚP CẢI THIẾN HIỆU QUẢ THÔNG TIN CỦA GIÁ CỔ PHIẾU HAY KHÔNG?

Ngày nhận bài: 05/07/2021

Ngày chấp nhận đăng: 05/11/2021

Đặng Thị Hồng Ngọc, Nguyễn Thanh Hương

ABSTRACT

This paper examines the effect of institutional investors on stock price informativeness. Using a comprehensive data set of firms listed on the Hochiminh Stock Exchange and the Hanoi Stock Exchange over the 2007 - 2017 period, we find that institutional ownership is negatively associated with stock price synchronicity, which is an inverse measure of stock price informativeness. This result is consistent with the notion that institutional investors contribute to inducing higher informational efficiency of stock prices.

Keywords: Ho Chi Minh City Stock Exchange; Hanoi Stock Exchange; institutional investors; stock price synchronicity; stock price informativeness; informational efficiency.

TÓM TẮT

Nghiên cứu này đánh giá ảnh hưởng của sở hữu nhà đầu tư tổ chức đến tính thông tin của giá cổ phiếu. Sử dụng dữ liệu của các công ty niêm yết trên Sở Giao dịch Chứng khoán TP. Hồ Chí Minh và Sở Giao dịch Chứng khoán Hà Nội trong khoảng thời gian từ 2007 đến 2017, kết quả nghiên cứu cho thấy sở hữu nhà đầu tư tổ chức có tác động nghịch chiều đến đồng biến động giá cổ phiếu - một thước đo ngược về tính thông tin của giá cổ phiếu. Kết quả này phù hợp với quan điểm cho rằng nhà đầu tư tổ chức góp phần nâng cao hiệu quả thông tin của giá cổ phiếu.

Từ khoá: Sàn giao dịch Chứng khoán TP. Hồ Chí Minh; Sàn giao dịch Chứng khoán Hà Nội; nhà đầu tư tổ chức; đồng biến động giá cổ phiếu; tính thông tin của giá cổ phiếu; hiệu quả thông tin.

1. Introduction

The increased importance of institutional investors is widely documented in the finance literature. While most existing research has focused on the benefits of institutional trading to developed markets (e.g., Bushee, 1998; Gompers & Metrick, 2001; Yan & Zhang, 2009; Boehmer and Kelley, 2009; Gallagher et al. 2013; Breugem & Buss, 2019), there are very few studies devoted to this issue in emerging countries.

In this paper, we study the impact of institutional ownership on informational efficiency in the context of Vietnam, which is an important developing market. Prior literature shows that institutional investors can access more accurate information at lower costs (Piotroski & Roulstone, 2004). In addition, as

highly sophisticated investors with quantitative skills, they tend to exploit private information for trading purpose (Boehmer & Kelley, 2009). Edmans (2009) also finds that greater incentives to become informed lead institutional investors to the aggregation of private information into the stock prices. Taken together, these studies suggest that the presence of institutional investors facilitates the incorporation of information into stock prices, and consequently, enhances the market's informational efficiency. Therefore, in this study, we expect a positive association between institutional investors and the stock price informativeness in the Vietnam stock market.

Đặng Thị Hồng Ngọc, Nguyễn Thanh Hương,
Trường Đại học Kinh tế - Đại học Đà Nẵng

We use stock price synchronicity as an inverse indicator of stock price informativeness. Specifically, stock price synchronicity is estimated using the R-square (R^2) derived from the standard market model (Roll, 1988; Morck et al., 2000, Durnev et al., 2003; Durnev et al., 2004). Firms with low (high) value of R^2 , ceteris paribus, have a relatively greater amount of firm-specific (market-wide) information being impounded into prices. Motivated by Lang & Maffet (2011), we additionally estimate stock price synchronicity using the beta coefficient in the market model, which also decreases with the firm-specific information component in the stock prices.

We test our prediction employing a sample of firms listed on the Hochiminh Stock Exchange and the Hanoi Stock Exchange during the period from 2007 to 2017. We find consistent evidence, namely, institutional ownership is negatively correlated with stock price synchronicity. This finding holds when we add lagged dependent variable to address potential endogeneity concerns, and when we conduct a series of tests by controlling for firm fixed effects and the impacts of exchanges where the firms are listed. Further, our results remain robust in our non-crisis analysis. Collectively, our results provide support to the argument that institutional investors contribute to improving the informational efficiency.

Our study contributes to the growing literature related to the impact of institutional ownership on stock market informational efficiency. While there are a large number of studies providing evidence on the informational role of institutional trading in developed markets (e.g., Gallagher et al., 2013; Bharath et al., 2013; Luo et al., 2014; Boone et White, 2015; Gorton et al., 2017), little is known about this link in emerging

countries (e.g., Bae et al., 2012; Syamala & Wadhwa, 2019; Kim & Yi, 2015). Our paper provides additional findings and insights by focusing on Vietnam, which is an important emerging economy.

The remainder of this paper proceeds as follows. Section 2 reviews the related literature. Section 3 explains the research methodology and data. We present our empirical results in Section 4 and conclude in Section 5.

2. Related literature

This paper is related to two main literatures. The first is the literature on measures of informational efficiency. The most common measure of informational efficiency is stock price synchronicity (Roll, 1988), which is based on the correlation between stock returns and market returns. A low stock price synchronicity implies high informational efficiency. A second popular measure is PIN (probability of informed trading), suggested by Easley, Kiefer & O'Hara (1996, 1997a, 1997b). Using information from trading process, PIN directly captures the probability of informed trading in a stock. However, in this study, stock price synchronicity is the sole measure that could be used for the test due to the data limitations.

Second, our results contribute to the literature that examines the impact of institutional ownership on stock market informational efficiency, especially in emerging markets. In fact, evidence from a large body of research demonstrates that institutional investors contribute to improving informational efficiency in developed markets. For example, using data of Australian equity funds, Gallagher et al. (2013) find that an increase in the number of institutional investors is associated with lower spreads and hence, higher price

informativeness. Luo et al. (2014) show that the presence of institutional investors, especially foreign institutions in the Japanese market increases the amount of information incorporated into the stock prices in this country. Studies on the U.S. market document that prices become more efficient for stocks with multiple institutional investors (Bharath et al., 2013; Gorton et al., 2017), as they help facilitate information production by lowering information asymmetry (Boone & White, 2015).

Very few studies including Bae et al. (2012), Syamala & Wadhwa (2019), Kim & Yi (2015) investigate the link between institutional ownership and informational efficiency in emerging markets and find consistent results with institutional trading improving transmission of information into prices. The literature on the effect the institutional trading on informational efficiency in the Vietnam stock market is even much more limited. Using data for listed firms on the Hochiminh stock exchange, Dang (2018) finds that large shareholders is negatively associated with stock price synchronicity. To et al. (2021) show that the existence of the largest non-state shareholders enhances the incorporation of firm-specific information into stock prices in Vietnam.

3. Research method

3.1. Data

We obtain stock prices and firm-level accounting data from FiinGroup, which is a leading financial information and data supplier in Vietnam. The sample includes all non-financial companies listed on the two major stock exchanges in Vietnam including the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) during the period from 2007 to 2017.

3.2. Specification and variable construction

3.2.1. Stock price synchronicity

In this study, we follow Roll (1988) to estimate our measure of stock price synchronicity. More specifically, we use the R-squared (R^2) derived the standard market model as follows:

$$r_{i,t} = \alpha_i + \beta_i r_{M,t} + \varepsilon_{i,t} \quad (\text{I})$$

where $r_{i,t}$ is the stock i 's returns and $r_{M,t}$ is the market returns in year t .

A growing number of studies support this standpoint, employing the R^2 as an inverse measure of the amount of information incorporated in firms' stock prices (e.g., Wurgler, 2000; Durnev et al., 2004; Lin et al., 2015). The logic is that the more stock-specific information is reflected in a stock's price, the greater the tendency for the stock price to move independently of the market and thus the lower the R^2 . In other words, a lower synchronicity of stock prices indicates that the stock market is more informationally efficient (Roll, 1988; French & Roll, 1986).

As the value of R^2 is bounded within $[0,1]$, we take the logistic transformation of this variable when it is used in further analysis.

$$\Psi_i = \log \frac{R_i^2}{1-R_i^2} \quad (\text{II})$$

We also use the β of the model (I) as another measure of stock price synchronicity.

3.2.2. Institutional Ownership

We use three different proxies for the presence of institutional investors including Institutional Ownership (IO), Domestic Institutional Ownership (DIO), and Foreign Institutional Ownership (FIO). Institutional ownership (IO) represents the ratio of the number of shares held by the group of institutional shareholders to the firm's total outstanding shares. Domestic Institutional

Ownership (DIO) is the ratio of the number of shares held by domestic institutional investors to the firm's total number of outstanding shares. Foreign Institutional Ownership (FIO) is the ratio of the number of shares held by foreign institutional investors to the total number of outstanding shares.

3.2.3. Specification

Our hypothesis is that the presence of institutional investors contributes to increasing stock price informativeness. In other words, we expect a negative relation between institutional ownership and stock price synchronicity. The baseline equation for testing the hypothesis is as follows:

$$\text{SYNCH}_{i,t} = \alpha + \eta \text{IO}_{i,t-1} + \sum \text{Controls}_{i,t-1}^j + \theta_n + \delta_t + \varepsilon_{i,t} \quad (\text{III})$$

where SYNCH is stock price synchronicity of stock i in year t . IO is institutional ownership.

Based on previous studies, we control for other factors that might have impacts on the Table 1. *Descriptive Analysis - Summary table*

stock price synchronicity including company size (MV), market-to-book ratio (MB), stock return volatility (STDRET), annual rate of return (ARET), leverage (LEV), and return on assets (ROA). Model (III) also includes industry-fixed effects (θ_n) and year-fixed effects (δ_t). The regression is estimated using robust standard errors to correct for heteroskedasticity and clustering at the firm level (Petersen, 2009).

4. Research Results

4.1. Summary statistics

The average stock price synchronicity of listed firms in Vietnam over the sample period is -2.992 as measured by Ψ , and 0.969 as measured by β from the market model (I). Institutional shareholders own 30.8% of the total outstanding shares of listed companies. Specifically, domestic institutional investors hold 26.1% of total outstanding shares of companies. In the meanwhile, foreign institutional investors hold about 4.6% of total outstanding shares of listed companies.

Variables	Observations	Mean	Std. Deviation	90 percentile	75 percentile	Median	25 percentile	10 percentile
Ψ	3932	-2.992	2.477	-0.187	-1.215	-2.601	-4.296	-6.171
B	3932	0.969	1.067	2.248	1.492	0.861	0.335	-0.143
IO	3932	0.308	0.312	0.766	0.581	0.233	0.000	0.000
FIO	3932	0.046	0.106	0.176	0.023	0.000	0.000	0.000
DIO	3932	0.261	0.283	0.680	0.517	0.136	0.000	0.000
MV	3932	-1.582	1.659	0.516	-0.596	-1.687	-2.654	-3.653
MB	3932	-0.131	0.744	0.807	0.346	-0.104	-0.612	-1.094
StdRet	3932	0.132	0.069	0.219	0.166	0.117	0.083	0.061
ARet	3932	0.005	0.448	0.548	0.267	0.014	-0.274	-0.590
LEV	3932	0.496	0.221	0.779	0.671	0.517	0.318	0.183
ROA	3932	0.063	0.080	0.146	0.096	0.049	0.018	0.003

4.2. Effects of institutional ownership on stock price synchronicity

Table 2 summarizes the results of regression (III). We find that as expected, institutional investors are significantly negatively associated with both measures of stock price synchronicity, consistent with the notion that institutional investors help increase the amount of firm-specific information in stock prices and induce higher informational efficiency in the stock markets (Luo, Chen & Yan, 2014). To evaluate the economic significance of the results, we use

the estimated coefficients of the institutional ownership variable (IO) in column (1) as an illustration. A one standard deviation increase in the ownership of institutional investors in the company will decrease stock price synchronicity's standard deviation by 5% ($= 0.312 \cdot (-0.398) / 2.477$). The results also show that stocks of firms with large market capitalization (MV) and high return volatility (StdRet) are associated with high synchronicity. By contrast, stocks those have higher market value than book value (MB) tend to be less synchronous.

Table 2. Effects of Institutional ownership on Stock price synchronicity

VARIABLES	Ψ		β	
	(1)	(2)	(3)	(4)
IO	-0.398*** (-3.53)	-0.787*** (-4.83)	-0.309*** (-5.78)	-0.493*** (-5.78)
MV	0.566*** (21.87)	0.603*** (18.27)	0.209*** (14.00)	0.235*** (11.56)
MB	-0.918*** (-16.21)	-0.957*** (-14.34)	-0.421*** (-12.97)	-0.434*** (-10.43)
StdRet	3.373*** (5.94)	3.233*** (5.09)	2.706*** (8.17)	2.401*** (5.47)
ARet	-0.151 (-1.63)	-0.146 (-1.28)	-0.150*** (-3.01)	-0.164** (-2.57)
LEV	0.072 (0.42)	0.228 (1.09)	0.052 (0.59)	0.104 (0.94)
ROA	-0.635 (-1.18)	0.228 (0.35)	-0.730*** (-2.76)	-0.289 (-0.90)
Constant	-0.753*** (-2.62)	-0.414 (-1.23)	0.669*** (5.35)	0.906*** (5.99)
Fixed effects	IY	IY	IY	IY
Observations	3,914	2,626	3,914	2,626
R^2 (%)	32.09	32.87	15.22	15.11

Note. Robust t-statistics in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Columns (1) and (3): All observations of the study sample.

Columns (2) and (4): Only non-missing observations of the study sample.

4.3. Robustness checks

We perform a number of tests to validate the robustness of our finding. Table 3 summarizes the results, focusing on the impact of institutional investors on stock price synchronicity for brevity.

In Panel A, we estimate the model using the system GMM approach (SGMM), controlling for lagged dependent variable to address potential endogeneity concerns that may arise due to reverse causality problem. In Panel B, we show the results when Table 3. *Robustness checks*

controlling for firm-fixed effects instead of industry-fixed effects. We control for the impacts of exchanges where the firms are listed in Panel C. In Panel D, we re-estimate Model (III) in a non-crisis period, in which we exclude the years of 2007 and 2008 from our sample. The results are robust, with stock price synchronicity being significantly negatively associated with institutional investors.

VARIABLES	Ψ		β	
	(1)	(2)	(3)	(4)
<i>Panel A: Controlling for Lagged dependent variable</i>				
Lag Ψ	0.159*** (5.65)	0.196*** (5.35)		
Lag β			0.143*** (3.59)	0.123** (2.58)
IO	-0.224* (-1.85)	-0.417*** (-2.69)	-0.212*** (-3.42)	-0.323*** (-3.69)
Controls	Yes	Yes	Yes	Yes
Fixed effects	IY	IY	IY	IY
<i>Panel B: Controlling for Firm-fixed effects</i>				
IO	-0.316* (-1.77)	-0.013 (-0.04)	-0.143* (-1.90)	-0.295** (-2.10)
Controls	Yes	Yes	Yes	Yes
Fixed effects	FY	FY	FY	FY
R^2 (%)	32.85	33.37	35.69	34.28
<i>Panel C: Controlling for Listing-fixed effects</i>				
IO	-0.400*** (-3.53)	-0.800*** (-4.85)	-0.317*** (-5.93)	-0.514*** (-6.04)
Controls	Yes	Yes	Yes	Yes
Fixed effects	IY	IY	IY	IY
R^2 (%)	32.07	32.87	15.40	15.43
<i>Panel D: Non-crisis analysis</i>				
IO	-0.423*** (-3.62)	-0.807*** (-4.86)	-0.324*** (-5.82)	-0.503*** (-5.80)
Controls	Yes	Yes	Yes	Yes
Fixed effects	IY	IY	IY	IY
R^2 (%)	28.14	29.51	15.53	15.43

Note. Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Columns (1) and (3): All observations of the study sample.

Columns (2) and (4): Only non-missing observations of the study sample

4.4. Additional analysis

We also develop the following model to investigate the effects of domestic and foreign institutional ownership on stock price synchronicity:

$$\text{SYNCH}_{i,t} = \alpha + \eta_1 \text{FIO}_{i,t-1} + \eta_2 \text{DIO}_{i,t-1} + \sum \gamma \text{Controls}_{i,t-1}^j + \theta_n + \delta_t + \varepsilon_{i,t} \quad (\text{IV})$$

Table 10 shows that the effects are similar with both foreign and domestic institutional ownership being negatively and significantly correlated with stock price synchronicity, confirming that institutional investors contribute to improving the informational market quality.

Table 4. *Domestic Institutional Ownership (DIO), Foreign Institutional Ownership (FIO) and Stock Price Synchronicity*

VARIABLES	Ψ		β	
	(1)	(2)	(3)	(4)
FIO	-1.029*** (-3.10)	-1.736*** (-4.40)	-0.432*** (-2.85)	-0.855*** (-4.35)
DIO	-0.299** (-2.49)	-0.681*** (-4.18)	-0.294*** (-4.88)	-0.464*** (-5.32)
Controls	Yes	Yes	Yes	Yes
Fixed effects	IY	IY	IY	IY
R^2 (%)	32.12	33.00	15.22	15.24

Note. Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Columns (1) and (3): All observations of the study sample.

Columns (2) and (4): Only non-missing observations of the study sample

5. Conclusions

This paper investigates the effect of institutional ownership on stock price informativeness in the Vietnam equity market using data drawn from firms listed on the Ho Chi Minh City Stock Exchange and the Hanoi Stock Exchange during the period from 2007 to 2017. Our results confirm a positive and significant link between institutional ownership and stock price informativeness, consistent with the notion

that stock prices of firms with higher institutional ownership contain more firm-specific information and less market-wide information. In other words, institutional investors improve stock price informational efficiency in the market. Our study provides further insight into the role of institutional investors in stock price informativeness in the context of Vietnam, which is important for the policy formulation process in this emerging market.

REFERENCES

- Aggarwal, R., Erel, I., Ferreira, M., Matos, P. (2011) Does governance travel around the world? Evidence from institutional investors. *Journal of Financial Economics*, 100, 154-181.
- An, H., Zhang, T., (2013) Stock price synchronicity, crash risk, and institutional investors. *Journal of Corporate Finance*, 21, 1-15.
- Bae, K. H., Ozoguz, A., Tan, H., & Wirjanto, T. S. (2012). Do foreigners facilitate information transmission in emerging markets?. *Journal of Financial Economics*, 105(1), 209-227.
- Bharath, S. T., Jayaraman, S., & Nagar, V. (2013). Exit as governance: An empirical analysis. *The Journal of Finance*, 68(6), 2515-2547.
- Boehmer, E., & Kelley, E. K. (2009). Institutional investors and the informational efficiency of prices. *The Review of Financial Studies*, 22(9), 3563-3594.
- Boone, A. L., & White, J. T. (2015). The effect of institutional ownership on firm transparency and information production. *Journal of Financial Economics*, 117(3), 508-533.
- Brennan, M., Subrahmanyam, A. (1995). Investment analysis and price formation in securities markets. *Journal of Financial Economics*, 38.
- Breugem, M., & Buss, A. (2019). Institutional investors and information acquisition: Implications for asset prices and informational efficiency. *The Review of Financial Studies*, 32(6), 2260-2301.
- Brockman, P., Yan, X. (2009). Block ownership and firm specific information. *Journal of Banking and Finance*, 33, 308-316.
- Brunnermeier, M.K., Pedersen, L.H. (2009). Market liquidity and funding liquidity. *Review of Financial Studies*, 22, 2201-2238.
- Bushee BJ (1998). The influence of institutional investors on myopic R&D investment behavior. *Account Rev*, 73, 305-333.
- Chen, Q., Goldstein, I., Jiang, W. (2007). Price informativeness and investment sensitivity to stock price. *Review of Financial Studies*, 20.
- Dang, T.L., Moshirian, F., Zhang, B. (2015). Commonality in news around the world. *Journal of Financial Economics*.
- Dang, T.L., Nguyen, T.H., Tran, N.T.A., Vo, T.T.A. (2018). Institutional ownership and stock liquidity: International evidence. *Asia-Pacific Journal of Financial Studies*, 47, 21-53.
- Dow, J., Gorton, G. (1997) Stock market efficiency and economic efficiency: Is there a connection?. *Journal of Finance*, 52.
- Durnev, A., Morck, R., Yeung, B., Zarowin, P. (2003). Does greater firm-specific return variation mean more or less informed stock pricing?. *Journal of Accounting Research*, 41.
- Durnev, A., Morck, R., Yeung, B. (2004). Value-enhancing capital budgeting and firm-specific stock return variation. *Journal of Finance*, 59.
- Đặng Tùng Lâm (2016). Ảnh hưởng của cổ đông lớn đến sự đồng biến động giá cổ phiếu trên Sở Giao dịch Chứng khoán Thành phố Hồ Chí Minh. *Tạp chí phát triển kinh tế*, (JED, Vol. 27 (5)), 63-77.
- Edmans, A. (2009). Blockholder trading, market efficiency, and managerial myopia. *The Journal of Finance*, 64(6), 2481-2513.

- Fernandes, N., Ferreira, M. A., (2009). Insider trading laws and stock price informativeness. *Review of Financial Studies*, 22, 1845-1887.
- Ferreira, M., Matos, P. (2008). The colors of investors' money: the role of institutional investors around the world. *Journal of Financial Economics*, 88, 499-533.
- Gallagher, D. R., Gardner, P. A., & Swan, P. L. (2013). Governance through trading: Institutional swing trades and subsequent firm performance. *Journal of Financial and Quantitative Analysis*, 48(2), 427-458.
- Gompers, P. A., & Metrick, A. (2001). Institutional investors and equity prices. *The quarterly journal of Economics*, 116(1), 229-259.
- Gorton, G. B., Huang, L., & Kang, Q. (2017). The limitations of stock market efficiency: Price informativeness and CEO turnover. *Review of Finance*, 21(1), 153-200.
- Heflin, F., Shaw, K.W., (2000). Blockholder ownership and market liquidity. *Journal of Financial and Quantitative Analysis*, 35, 621-633.
- Hutton, A. P., Marcus, A. J., Tehranian, H., (2009). Opaque financial report, R^2 , and crash risk. *Journal of Financial Economics*, 94, 67-86.
- Jin, L., Myers, S. C., (2006). R^2 around the world: New theory and new tests. *Journal of Financial Economics*, 79, 257-292.
- Kim, J.B., Yi, C.H. (2015). Foreign versus domestic institutional investors in emerging markets: Who contributes more to firm-specific information flow?. *China Journal of Accounting Research*, 8.
- Li, K., Morck, R., Yang, F., Yeung, B. (2004). Firm-specific variation and openness in emerging markets. *Review of Economics and Statistics*, 86.
- Luo, M., Chen, T., Yan, I.K. (2014). Price informativeness and institutional ownership: Evidence from Japan. *Review of Quantitative Finance and Accounting*, 42.
- Morck, R., Yeung, B., Yu, W. (2000). The information content of stock markets: Why do emerging markets have synchronous stock price movement?. *Journal of Financial Economics*, 58, 215-260.
- Petersen, M.A., (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies*, 22, 435-480.
- Piotroski, J. D., Roulstone, B. T. (2004). The influence of analysts, institutional investors, and insiders on the incorporation of market, industry, and firm-specific information into stock prices. *The Accounting Review*, 79, 1119-1151.
- Roll, R. (1988). R^2 . *Journal of Finance*, 43, 541-566.
- Shleifer, A., Vishny, R.W., (1986). Large shareholders and corporate control. *Journal of Political Economy*, 94, 461-488.
- Syamala, S. R., & Wadhwa, K. (2019). Foreign institutional investors' trading and information dissemination in emerging markets: Further evidence. *Research in International Business and Finance*, 49(C), 301-314.
- Teoh, S.H., Yang, Y., Zhang, Y., (2007). R-square: noise or firm-specific information?. Unpublished working paper. University of California, Irvine, Chinese University of Hong Kong.

- To, A. T., Le, T. D., Tran, Q. T., Nguyen, T. L., & Ho, T. T. H. (2021). Large Shareholders and Stock Price Synchronicity: Evidence from Vietnam. *Global Business Review*, 09721509211005673.
- Tobin J. (1984). On the efficiency of the financial system. *Lloyd's Bank Rev*, 153.
- Veldkamp, L.L., (2006). Information markets and comovement of asset prices. *Review of Economic Studies*, 73, 823-845.
- Yan, X., & Zhang, Z. (2009). Institutional investors and equity returns: Are short-term institutions better informed?. *The Review of Financial Studies*, 22(2), 893-924.