Information Environment Quality and its Impact on Return and Investment Decision

By

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Dedicated to My Family

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ABSTRACT

This study contributes to literature in four ways to explore the dynamics of stock price synchronicity (SPS). Firstly, it tests the weak form of market efficiency. Secondly, measures the effect of information environment on SPS by using firm specific variables i.e. liquidity, illiquidity, cost of information, trading cost and investor attention. Thirdly, this study attempts to investigate the relationship between information environment and foreign investment. Fourthly, role of information environment premium or SPS premium in explaining equity returns is explored.

This study investigates the weak form of efficiency of Karachi stock exchange using a set of parametric and non-parametric tests that include Jarque-Bera and Kolmogrov-Smirnov (KS) test for normality, autocorrelation and Run test for autocorrelation, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) for stationarity and multiple variance ratio (MVR) test. The results of the study indicate that daily, weekly and monthly returns do not follow random walk. So, investors can use technical analysis to devise investment strategies.

This study also examines the relationship between SPS and firm specific variables associated with information environment. Results indicate that age, size, institutional ownership, book to market ratio, trading cost, liquidity, illiquidity and returns have significant impact on SPS. Various proxies of liquidity and illiquidity are used to test the robustness of results. These proxies include volume, turnover rate, value traded, Amihud illiquidity and percentage of zero volume days. The results suggest that the differences in idiosyncratic volatility are not linked with the more or less information of firm specific attributes. It appears to be linked with noise in returns. Findings of this study are in line with West (1988) and Lettau Malkiel and Xu (2001). This study further suggests that low stock price synchronicity is a result of imbedding of firm specific variables information in to stock prices. If quality of information environment is good, market model R square will be higher represented by large institutional holding, greater age, lower trading cost, large size, value stocks, low illiquidity, high liquidity and large information events.

In next phase, this study examines the relationship between foreign investment and information environment. Results indicate that Institutional ownership, age, trading cost, size, liquidity and illiquidity influence foreign investment. Institutional ownership, size and percentage of zero volume days have significant and positive impact on foreign investment and trading activities have negative association with foreign investment. Such deviations might be the effect of herding, noise trading and instable dynamics of emerging markets.

Finally, this study explores the impact of size premium, value premium, information efficiency premium on average equity returns using the methodology proposed by Fama and French (1992, 1993). Result indicates that size premium, values premium and information efficiency premium are priced by the market. Market premium, size premium, value premium and information efficiency premium significantly explain equity returns in single factor, three factor and four factor model. Capital asset pricing model (CAPM) is valid for explaining average equity returns but multifactor model captures additional information. Therefore, it can be concluded that size premium, value premium and information efficiency premium are considered as systematic risk and priced by the market.

Table of contents

List of Tables

ABBREVIATIONS

SPS	Stock price synchronicity
RWM	Random Walk Model
EMH	Efficient Market Hypothesis
FI	Foreign Investment
MPT	Modern Portfolio Theory
Rmkt	Return of market portfolio
Rp	Return on asset portfolio
Ri	Return on asset i
Rf	Return on risk-free asset
BTM	Book to market
BE/ME	Book equity/Market Equity
E/P	Earning price ratio
CAPM	Capital Asset pricing Model
HML	High minus Low
SMB	Small Minus Big
IEP	Information efficiency premium
SLM	Sharpe, Lintner and Mossin model
SLB	Sharpe, Lintner and Black model

CHAPTER 1

1. INTRODUCTION

Information plays a critical role in stock market behavior, whether it is macroeconomic or company specific. Because, information is required for individuals and institutional investors to invest in different securities including bonds, stocks, portfolio or other financial assets. Efficient Market Hypothesis (EMH) states that "change in any information is fully reflected by securities at a given point of time". But, information asymmetry is a fundamental issue for all participants including insider, outsider and all market participants (including regulator). It is always a main goal of regulator to reduce information asymmetry through firm fundamentals for investor protection. Number of researchers emphasize on reduction of information asymmetry by recommending mandatory disclosure, regulation of financial information and corporate governance practices (Frankel & Li, 2004). But the argument is still there "A firm's stock price reflects all information related to market factors, industry factors and firm specific variables". Because, stock prices co-vary with industry returns and market returns (King, 1988).

In the presence of information asymmetry investor may have incomplete information about firm specific variables and only rely on market factors while making investment decisions. In this scenario, stock price discovery will be dependent on overall market trend than firm specific variables. Extensive work has been done on stock price synchronicity (SPS) using R square obtain from the regression of individual stock return to stock market returns. SPS is defined as the tendency of stock market prices to move in the same direction in a given period of time. Roll (1988) reports that stock price variations are not fully captured by market level or industry level information and the residual movements in stock price variations are captured by firm specific variables. Roll further suggests that when there is more firm specific information, there is higher idiosyncratic volatility and the low R square. Firm specific information is uncorrelated with market returns and behaves differently from public information, which cannot price into stocks at the moment it is generated, but can incorporate in prices by using informed trading (French and Roll, 1986).

West (1988) presents a theoretical model, which says that firm specific return variations are linked with less information of firm specific variable and more noise in returns. The study argues that less information incorporation results in high idiosyncratic volatility and thereby reduces SPS. Whereas, Morck, Yeung, and Yu (2000) opens new dimensions of research that low R square is not just the representative of information but also the reflection of quality of investor protection rights and corporate governance practices. Their findings suggest that there is low SPS in developed markets due to strong legal system, well established institutional structure, informed trading and quality of information environment based on firm specific information. Because, developed countries stocks are more informational efficient with better price discovery. Whereas, in lesser developed countries have greater impediments and high SPS.

Dasgupta et al. (2010) argue that in an efficient market stock prices only respond to that announcement that is not anticipated in advance. As firm improves the information environment surrounding, that results the availability of firm specific information to all market participants. Such firms will show high SPS than firms where news about future events is revealed more slowly. This would lead to dependence on R square and producing erroneous conclusions about the quality of the firms' disclosure policies. Therefore, more informative stocks today have low firm specific variation in future and have high SPS. To measure information efficiency different studies, make use of R square as a proxy of SPS (Wurgler, 2000 and Durnev, Li, Morck, and Yeung, 2003). While, West (1988) reports that firm specific return volatility is positively related to bubbles, fad and other non-fundamental variables. Although two different conclusions are presented by the literature, but these arguments suggest that average R square using SPS can be used as a proxy of information environment quality or noise.

This study contributes to literature in four ways to test the dynamics of SPS. Firstly, it explains the market efficiency. Secondly, measure the effect of information environment by using firm specific variables i.e. liquidity, illiquidity, cost of information, trading cost and investor attention on SPS. Thirdly, this study attempts to build the relationship between information environment and foreign investment, to explain whether information environment is able to attract foreign investment or not. Fourthly, this study investigates that information environment premium or SPS premium is priced by market and market considers this factor as systematic risk or not.

1.1 THEORETICAL BACKGROUND

1.1.1 Efficient Market Hypothesis (EMH):

Stock market efficiency is one of the most debated topics of modern finance. Modern financial markets have one proposition that these markets are efficient. The term efficiency refers to the association of information with stock prices. In this context, the EMH refers to the adjustment of stock prices in a timely manner and is based on the rapid incorporation of relevant information. So, no investor is able to get the abnormal return from any investment (Reilly and Brown, 2011). According to Fama (1970), if a market is efficient it reflects all the available information and helps in fair price discovery of stocks then it is helpful in allocation of recourses. For the purpose of resource allocation, it is more important to observe the behavior of the market.

The market is said to be efficient if there is a rapid and quick response from the market (Jones, 2007). Dyckman and Morse (1986) state "***A security market is generally defined as efficient if (1) the price of the security is traded in the market act as though they fully reflect all available information and (2) these prices react instantaneously, or nearly so, and in an un-bias fashion to new information***". In other words, market price of the security is an accurate price of the security that is traded in any market and contains all the information necessary for transaction is always unbiased to the new information coming in. On the other hand, there is a possibility that a stock or security does not contain the accurate information and investor may not be able to interpret the information in better way. That may result in the inefficiency of the market and reject EMH (Aumeboonsuke and Dryver, 2014).

The idea of EMH still have not been considered for any implication and is overlooked till Cootner (1964) has published the English version of Bachelier's PhD dissertation. Bachelier (1900) has provided the roots and theoretical framework of EMH, with a debate that random fluctuations persist in commodity prices. The study argues that market price reflects all periodic events (i.e. past, present and future discounted events); however, it does not show apparent relationship with price changes. Samuelson (1965) opens a new avenue in modern economic literature by expanding the work of Bachelier (1900). It states that "***if one could be sure that a price would rise, it would have already risen***" and furthermore, creates a link between the random fluctuation behaviors with changes in prices.

For the explanation and empirical validation of EMH phenomenon has become a major challenge by academic scholars. In 1965, Eugene Fama has used extensive tests in his PhD dissertation for the validity of Random walk of stock prices and concludes that movements of stock prices are unpredictable. This study observes that larger changes in daily prices are only followed by larger changes in prices. These changes can be positive or negative and it happens randomly that means price changes are random and cannot affect investment decision and are aligned with the concept of efficiency.

From 1965 to 1998, Fama's numerous studies on market efficiency develop a new approach for market efficiency. From 1960's to early 70's most debate conclude that changes in prices are linked with the individual securities or with the market (Fama 1965; Samuelson 1965 and Sharpe 1966), whereas, in 1980's researchers are more focused towards testing of these theories both theoretically and empirically. Most studies (Fama 1965, 1970, 1991 and Fama and French, 1988) report consistent evidences and are aligned with the hypothesis that security prices reflect all available information and efficient markets are unsuccessful to give anomalous profits. Historically, EMH has been subdivided by Robert in 1967 and then extending from the idea of Robert, Fama introduces the word "efficient market". The idea of efficiency envelops different facets and categorize in different contexts of economics and finance. Fama (1970) explains the market efficiency more precisely into three different categories weak form, semi-strong form and strong form of efficiency on the basis of available information. Following are the categories which are classified by Fama on the basis of available information set:

1.1.1.1 Weak form of efficiency

It is the lowest form of efficiency that defines "***a market is said to be weak form efficient if current prices fully reflect all historical information contained in past prices***". This means past prices cannot be used to forecast the movements in future stock prices. So, no investor can earn abnormal returns by using behavior of historical prices (Truong, 2006).

1.1.1.2 Semi strong form of efficiency

The second form of efficiency states that "***current prices reflect all publically available information, for example information about exchange rate, interest rate, money supply, earnings announcements, dividend announcements, stock splits, etc."***. This form implies that it is not possible for traders to earn abnormal returns just evaluating annual reports of the companies or by using other published information. Because, market immediately adjust the prices with the arrival of any good or bad news contained by these published reports (Truong, 2006).

1.1.1.3 Strong form of efficiency

The strong form of efficiency states that "***securities reflect all relevant information including both public information and private information***". This form indicates that it is hard to get private information (insider information) for any market participant to earn abnormal returns. Because, it is assumed by strong form efficiency that insider information cost is zero. In reality, this assumption is non-existent, so this form of efficiency is not expected to hold (Truong, 2006).

Fama (1970) builds his hypothesis about EHM with a very simple statement that "***security prices fully reflect all available information***". Fama (1991) revisits all the developments and contributions of market efficiency from 1970 to 1990 after going through the contribution of SLB Model (Sharpe, 1964; Lintner, 1965 and Black, 1972) model, the criticism on it, and the development of Arbitrage pricing theory (APT) with almost all anomalies. The study concludes that "***prices reflect information to the point where the marginal benefits of acting on information (the profits to be made) do not exceed marginal costs***". Fama (1998) further adds that "***The alternative must also explain the range of observed results better than the simple market efficiency story; that is, the expected value of abnormal returns is zero, but chance generates deviations from zero (anomalies) in both directions***".

Malkiel (2003) criticizes the idea of EMH that stock prices are not predictable; and establishes the argument that prices are partially predictable. In response to Fama's argument that states "***when any new information arises, it spreads very quickly and adjusts in the prices of stocks without any delay***". Malkiel argues that "***if information flow is unimpeded and immediately***

incorporated in stock prices then changes in tomorrow's price will be reflected by tomorrow's news and it is independent from today's price change." Thus, Technical analysis only studies the past price changes to predict the future prices and fundamental analysis only help the investor to select a stock on the basis of comparison of earnings and other attributes of a company. It contradicts that markets are fully efficient, because collective judgments may also be wrong at some point of time as there always exists less rationality in some market participants. Professionals cannot uncover all information that can be quickly incorporated in stock prices (Grossman and Stiglitz 1980).

1.1.2 Stock Price Synchronicity and information characteristics

The concept of "Synchronicity" is introduced in psychology literature by Carl Jung in 1920's, that events are "meaningful coincidences". But Jung gives full statement regarding synchronicity in 1951, while presenting a lecture in Eranos. Then this concept is formally discussed in a published paper in 1952 "Synchronizität als ein Prinzip akausaler Zusammenhänge" (An Acausal Connecting Principle), is define by Jung "Synchronicity" as an "***acausal connecting principle in which events, both large and small, in the external world might align to the experience of the individual, perhaps mirroring or echoing personal concerns or thoughts***". In accounting and finance literature synchronicity is used in capital markets, to measure co-movement between stock prices and market in same or opposite direction.

West (1988) presents a theoretical model that more information incorporation results fair price discovery close to fundamental value of stocks, and results in stability in prices in future and raise R square. Roll (1988) reports that asset pricing regressions have low explanatory power, with the possible argument those stock price variations are not fully captured by industry level and market level information. Thus, he suggests that these residual movements are captured by firm specific variables.

Morck, Yeung, and Yu (2000) interpret R square as, high R square values means greater SPS and stocks reflect more market wide information. Whereas, low R square values means low SPS and stocks reflect more firm specific information. Morck, Yeung, and Yu (2000) uses market returns, industry returns to explain stock returns to estimate R square, whereas Roll (1988) and Piotroski and Roulstone (2004) measure R square with asset pricing regression models by regressing individual firm return with market return called market model. Market model relates the return on security to only one factor, which is return on market portfolio. For example, simple market model comprises on return for the period t of individual stock and return for the period t of market portfolio. To get high explanatory power for this model, firm stock prices must align with the share prices of overall market firms. The explanation of this model is after removing the effect of systematic factors from this equation the residual movements are captured by firm specific variables.

Morck, Yeung, and Yu (2000) first time explore cross country differences in SPS and report an inverse relationship between SPS and government protection of property rights. These results are consistent with Roll's justification that less property rights are the impediments to firm specific informed trading. On the basis of Morck, Yeung, and Yu's finding, Wurgler (2000) argues that capital allocation can improve through three mechanisms. Firstly, he agrees with Morck, Yeung, and Yu (2000) that countries impound more firm specific information in to stock prices having less SPS. Secondly, countries where state ownership is to high do not invest in growing industries and brings improvement in capital allocation brings decrease in state ownership. He has also supported the view of Shleifer (1998) that "***elimination of politically motivated resource allocation has unquestionably been the principal benefit of privatization around the world***". Thirdly, he argues on the basis of the measurements of La Porta et al. (1998) that strong minority investor rights are associated with capital allocation. Wurgler (2000) reports an inverse relationship between efficiency of capital allocation and state ownership industry investments in economy. But, efficiency of capital allocation positively related with firm specific information in stock returns and legal protection of minority investors. Consistent with informed trading the capital allocation, Wurgler (2000) finds an inverse relationship between the elasticity of industry investments and SPS.

Similarly, Durnev, Morck and Yeung (2002) document that how efficient capital allocation brings variations in firm's stock return. Because, flow of firm specific information leads towards greater monitoring and increase information quality among users of information. Results of this study suggests that low synchronicity and efficient capital allocation decisions indirectly supports the interpretation that synchronicity reflects the flow of firm-specific information. Durnev, Morck, Yeung and Zarowin (2003) suggest that high stock variations are linked with high information content about future earnings. Piotroski and Roulstone (2004) address the question that why high degree of co-movement persists in US firms than other markets. The study examines how trading and trading generated activities of three market participants i.e. financial analysts, institutional investors and insiders influence the SPS impounded firm specific, industry and market level information. The study reports positive relationship between these analyst forecasting activities and SPS. It also reports an inverse association of SPS with institutional and insider trades.

Li, Morck, Yang, and Yeung (2004) examine SPS at country level by employing emerging markets data. Their findings suggest that R square declines overtime and this low R square represents strong legal system, openness in capital market and less corrupt economies. Similarly, Chan and Hameed (2006) report a positive impact of analyst following on SPS, which is consistent with the theory that analyst following incorporates market and industry level information into stock prices. Jin and Myers (2006) investigate the relationship between corporate transparency and SPS. The study reports that market level information can explain small portion of variations in stocks as compare to firm specific variables that results in low return synchronicity.

Ashbaugh-Skaife, Gassen and Lafond (2006) use Morck, Yeung, and Yu (2000) methodology and confirm the findings regarding R square, but provide little support for informational interpretation. Ashbaugh-Skaife et al. (2006) also examine SPS and information quality environment by using following four proxies, i.e. firm specific variables, future earnings information, analyst forecast errors and cross listing in the US, and suggest weak association of firm specific variables with SPS. In addition, Xing and Anderson (2011) argue that R square and firm specific variables have positive as well as negative (U shaped) relationship and R square can be low in the presence of good or bad information environment. Therefore, R square cannot be a global measure of information environment quality, because SPS measures noise (Teoh, Yang and Zhang, 2006 and Alves, Peasnell and Taylor, 2010).

Theoretically, several researchers argue that interpretation of information efficiency by R square is difficult to measure with standard models (West 1988; Campbell, et al., 2001; and Peng and

Xiong 2006). SPS and information environment quality are negatively related that propose R square can be used as an inverse proxy for information environment quality (Morck, Yeung, and Yu, 2000; Jin and Myers, 2006 and Haggard, Martin and Periera, 2008). In consistent with, Durnev, Morck, Yeung, and Zarowin (2003) also report the negative association of R square with information incorporation. Literature suggests that R square can be a proxy of information environment quality, despite the fact that totally different opinions hold. Together, these cross country studies use stock return synchronicity as a proxy for informed prices, and document market behavior that jointly validates their interpretation of synchronicity.

1.1.3 Foreign investment and Information characteristics

The depth and nature of the country's financial markets play a critical role in the economic development. Fundamentally banks and capital markets provide the role as intermediaries for the flow of funds from its savers to inventors. Banks facilitate the lender and borrowers, but capital markets perform both functions by providing platform to lender as well as owners. Through capital markets companies are able to spread the ownership of the companies by selling shares to different entities. Liquidity is one of the critical factors of stock market. The stock market liquidity refers to, first the acquisition of stocks and then how easily investor can sell these stocks without discounting. It is only then possible, when there are number of buyers and sellers. A well-functioning and developed stock market provides an efficient environment for investment in the country by attracting domestic as well as foreign investor.

Foreign investments are the major source of funds for emerging markets and are the important contributors for the economic development in these countries. The foreign capital is not a new concept, as long as there are evidences proving that international investments were happening often even 150 years ago. Foreign investments of some capitalist countries are in millions of pounds sterling (Emmanuel, 1972). Foreign investment in the United States has been increasing very rapidly since 1990. In that year, the share of foreign equities in the aggregate US portfolio increased from only 2.5 percent to 8 percent (Bohn & Tesar, 1996). Investors consider domestic and foreign investment to be perfect substitute assuming risk neutrality (Dunning and Rugman, 1985). But historically, it is believed that investments made in developed economies used to yield better financial returns to international investors, than the ones made in the emerging markets (Tebogo, 2011).

Neo classical theory argues that the differential rate of return explains foreign investment. The differential rate of return hypothesis infers that foreign investments are the result of capital flows from countries having low rates of return towards countries having high rates of return. Firms evaluate their investment decisions on the basis of company's expected marginal returns with marginal cost of capital, while going for both domestic and foreign investments. Therefore, the rate of return is the only variable, upon which investment decision depends. The theory received wide acceptance in the late 1950s when United States (U.S) foreign flows towards European manufacturing sector increased dramatically. At that time, after tax, the rates of return of U.S. subsidiaries in manufacturing sector have been consistently above the rate of return on U.S. domestic manufacturing. During the 1960s, U.S. foreign flows in Europe is continued to rise, although rates of return for U.S. subsidiaries in Europe is below the rates of return on their own domestic manufacturing sector (Moosa, 2002). Thus, it argues that the theory is not consistent with some countries experiencing simultaneously inflows and outflows of foreign investment.

Second theory in the domain of Neo-classical theory is "portfolio diversification" which relaxes on the assumption of risk neutrality. Expected returns do not provide a basis to explain the foreign investments. The choices among various investments by investors do not only depend on rate of return but also their given level of risk. For the selection of any investment proposal, a firm is apparently guided by both expected returns and the possibility of reducing risk. The idea behind this strand argues that reducing risks through portfolios diversifications. Hence, as the returns of activities in different countries are likely to have less than perfect, a firm reduces its overall risk by undertaking projects in more than one country. The theory is an improvement over the differential rates of return theory by including the risk factor. In this case, it can account for countries experiencing simultaneously inflows and outflows of foreign investment. However, it cannot account for the observed differences in the propensities of different industries to invest abroad, that is, unable to explain why foreign flows are more concentrated in some industries than in others (Moosa, 2002).

Neo classical theory takes the assumption of risk and return but does not account for the assumption of market imperfection. Hymer (1960) suggests that foreign investor has lack of knowledge about domestic firms. So, the firm specific characteristics play a key role in explaining foreign investment. Foreign firms thus prefer to locate in places where necessary information for their business is transparent and easy to access. He (2002) states that foreign firms use both public information and private information to make new investment decision. Public information, for example, about market size, economic growth, infrastructure, and foreign investment policies is easier to access in large and urban places. However, private information, for example, the strategies for selecting partners or the practical implementation of foreign investment policies is obtained through personal relationship or through a network of foreign investors clustering nearby. Hence, foreign investors incline to locate in urban or metropolitan locations where they can benefit information cost savings associated with proximity to a market, labor supply, good communications, and financial and commercial services.

The empirical evidence supports the argument that location choice of foreign firms is affected by information costs. Mariotti and Piscitello (1995) find that foreign firms in Italy prefer to locate in regions where they can easily obtain information such as metropolitan or boundary provinces. He (2002) also finds that foreign firms in China favor places where they can minimize information costs such as coastal cities and urban areas because reliable public information usually appear and spread easily in these regions as well as to locate in industrial clusters so that they can get information through networks of vicinal firms. These empirical results are confirmed by the study of Guimaraes et al. (2000) on foreign firms in Portugal.

According to Hoskisson et al. (2000), the institutions play a role in an economy to reduce both transaction and information costs by decreasing ambiguity, and hence creating a stable structure that facilitates interactions. Hence, economic agents in transition economies characterized by inconsistent and unstable institutional frameworks have to pay higher transaction and information costs associated with searching, negotiating and contracting with domestic partners (Meyer, 2001). Indeed, during the early phase of transition, uncertainties in institutional frameworks and lack of information about local environment often force foreign firms to rely on relationships not only with managers of other firms but also with governmental officials or to create joint ventures and alliances with local partners (Peng and Health, 1996 and Peng, 2003).

As a consequence, foreign investors may have to pay higher costs of obtaining information about local business environment.

Pull and push factors approach provides the basis for empirical analyses of the factors that influences foreign investments though less theoretical but attempts to knob together the various issues of investment. Calvo et al. (1993) document that the pull and push factor analysis differentiates between the local factors (pull) and the international factors (push) and identifies broad macroeconomic, institutional, and policy variables that influence the level and composition of capital flows. The push factors may also support in explaining the timing and levels of new capital inflows in a given country whereas the pull factors may be necessary in forming the distribution of inflows across regions (Montiel & Reinhart, 1999).

Griffin et al. (2003) document two imaginary countries local and foreign, each with one stock and that the returns of the two stocks are uncorrelated, shows that unexpectedly high returns of foreign stocks are attended by net equity inflows in the foreign country as long as local wealth is not too small compared to foreign wealth and that expectations are sufficiently predictive. Empirical literature on the pull-push factors discloses that foreign portfolio inflows are a function of multiple factors but with mixed results. Griffin et al. (2003) argues, in their study of nine emerging markets, that foreign investors invest more in a foreign market following more high returns in local and foreign markets and that they react quickly, often within one calendar day, when the markets decline.

1.1.4 Information efficiency premium and asset pricing

Precision of information in stock prices is an important characteristic of information environment, which reduces the uncertainty about firm value (Lambert and Verrecchia, 2015). High quality disclosure has more precision of information in stock prices and decease cost of equity (Francis et al., 2005). Botosan et al. (2004) examine the quality of public and private information, using analyst forecasts and report negative association between precision of public information in analyst's forecasts and cost of equity. This study also suggests that precision of private information in analysts' forecasts are positively associated with cost of equity and both private and public information offset the effect of each other. However, Lambert, Leuz and

Verrecchia (2012) suggest that precision of public and private information is an increasing function and it is negatively associated with the cost of equity.

Public information is not fully captured by market and the residual movements in stock price variations are captured by private information (Roll, 1988). The study further suggests that more firm specific information tend to have low R square or SPS. Farooq and Ahmed (2014) argue that SPS is an increasing function of governance environment of a firm and better governance mechanism reveal higher SPS and poor governance mechanism exhibit lower SPS. Leuz et al. (2003) argue that monitoring of managerial discretion is difficult for those firms have inadequate governance mechanism and managers of these firms do not disclose true information. Poor disclosure increases the information asymmetries for the investors. Prior literature suggests that investors show more reaction towards negative news for poor governance mechanism firms than higher governance mechanism firms (Douch, Farooq and Bouaddi, 2015). So, investors react more severely to the negative shocks in those firms having higher information asymmetries than firms have better governance mechanisms (Mitton, 2002).

Bae, Lim and Wei (2006) suggest that firms with poor governance environment hide bad information or release bad information slowly. As a result of such behavior, returns of these firms are positively skewed. Whereas, Douch, Farooq and Bouaddi (2015) argue that even in an inefficient market, investors are able to see such behaviors and will penalize such firms. So, there is more probability of negative tails in these firms with low governance environment. Results of this study report that low SPS is associated with poor governance and have higher probability of dominant negative tails.

Kelly (2007) reports that high SPS firms attract institutional investors and institutional investors are holding long term positions for stocks, they do not overreact to negative news. Institutional investors have positive relationship with corporate governance mechanism, because they prefer to invest in firms with better governance mechanisms, because of lower monitoring costs (Chung and Zhang, 2011). Therefore, the returns of those firms will be higher with high SPS than low SPS firms. As, Roll (1977) argues that market risk premium proxy of difference between market return and risk free rate is not capture true and complete market information and leads CAPM being invalid. Empirical literature identifies various anomalies which include size, BTM ratio, leverage, momentum, dividend yield etc. So, SPS based premium may also help to capture the variations in portfolio returns as a proxy of information efficiency using asset pricing models as an additional factor.

Capital asset pricing model (CAPM) is one of the most important and debatable topic of modern finance. CAPM is the central idea of finance based on “The portfolio theory of Markowitz (1952)”. The portfolio theory is based upon the portfolio selection by investors on the basis of expected return and risk. CAPM is based on the idea that principle if there is high expected risk investors demand additional risk. It is an economic model for valuing different securities and stock that are traded in equity market, different derivatives and assets that are associated with some kind of risk and expected return attached with it.

The problem arises that what should be done for calculating the expected return and risk, Sharpe (1964) developed a model, as an extension of Markowitz’s portfolio theory to introduce the concept of systematic and specific risk. Some parallel work has also been done by Treynor (1961), Lintner (1965), Mossin (1966) and Black (1972), and CAPM come in to existence. It is also named as SLB model that is Sharpe (1964), Lintner (1965) and Black (1972) model and SLM model Sharpe (1964), Lintner (1965) and Mossin (1966) model. For the work have been done on CAPM, Sharpe shared the 1990 Nobel Prize in Economics with Markowitz and Miller.
The traditional CAPM has long been debated by the researchers in a context to portfolio risk and returns that tries to find out the relationship between risk and return in a rational equilibrium market. It assumes that variance is sufficient tool to measure the risk and it might be acceptable if returns were normally distributed. But often returns are not normally distributed (Galagedera 2004). In other words, CAPM states that expected returns of stocks are positively related to market betas and these betas are the only risk factor to explain the cross-sectional variation of expected returns. CAPM does not help to identify and understand the ground factors and included their affect in the risk and return relationship. This model assumes that investors have the same opinion for the given beta and its return of any asset.

The idea behind CAPM is that investors need to be compensated in two ways. One is the time value of money and the second one is risk. Risk free rate is given for time value of money and is used as a compensation for the investors putting the money for that time period. The other portion of this formula represents the market risk premium. CAPM assumes that variance is sufficient tool to measure the risk. It might be acceptable if returns were normally distributed and CAPM does not explain the variation in stock returns. Jensen, Black and Scholes (1972) examine that those stocks have low beta that may offer higher returns than the model would predict.

Roll (1977) argues that using stock index as a proxy for the true market portfolio can lead to CAPM being invalid. Since the true and complete market index is not available such tests will be biased. Moreover, CAPM is used as a forecasting model that is the reason that it should be tested fairly and correctly to predict investor expectations regarding risk and return. This criticism led to the development of alternative models. Arbitrage pricing theory (APT) is one of such models that discuss the probability of more than one factor. The APT is an extension of the CAPM but in much more general concept. Both compute a linear relation between assets' expected returns and their covariance with other random variables. In CAPM, the covariance is with the market portfolio's return and in APT impact of as covariance with other factors is also considered. APT does not identify factors for a particular stock of industry/market. So the real challenge for the investor is to identify three things. First, each of the factors affecting a particular stock, second expected returns for each of these factors and the third one is the sensitivity of the stock to each of these factors.

APT is a valuation model developed by Ross (1976). The APT has the power to reduce CAPM weaknesses. CAPM argues that security rate of return is linearly related to a single common factor, the rate of return on the market portfolio. The APT assumes that each stock's or asset's return to the investor is influenced by several independent factors. This theory has the potential to predict a relationship between the returns of a portfolio and the returns of a single security through a linear combination of many independent macro-economic variables. APT covers a lot of factors which may occur for calculating the return of stock or assets. These can be divided into different groups, i.e. Macroeconomic factors, Company specific factors and behavioral factors.

Early work in this area including Jensen, Black and Scholes (1972), Fama and MacBeth (1973) and Blume and Friend (1973) support the standard and zero beta model of CAPM. A lot of criticism on single market premium model CAPM questions the asset pricing theory. Lately, anomalies are reported, Basu (1977) discuss earning price ratio and report that firms with low earning price ratio have yielded higher returns and firms with higher earning price ratio have produced lower returns than justified by β. The famous study of Banz (1981) finds that size (market capitalization) effect increase the explanatory power of model and helps to better explain cross section returns with market beta. This study reports that portfolio returns of small size stock are high with their given beta estimates as compare to large size stocks. Stattman (1980) and Rosenberg, Reid and Lanstein (1985) investigate BTM ratio and find that it is positively related with US stocks. BTM ratio takes significant part to explain cross-section portfolio returns (Chan, Hamao and Lakonishok, 1991). Bhandari (1988) also examines the relationship of leverage and average stock returns. This study suggested that there exists a positive relationship between leverage and portfolio returns.

Recently, Fama and French (1992, 1993, 1995, and 1996) report that calculation of simple beta is an insensible approach to forecast stock returns. They have reported that the portfolios formed on the basis of high BTM ratio, high earning price ratio, small size and high leverage earn higher returns. Therefore, it can be concluded that size, earning price ratio, BTM and leverage can capture the cross-sectional differences in return better than market β. All these firm specific variables incorporate information to the market and contribute towards explaining the equity market returns. Chen et al. (1986) have identified different macro-economic factors include Changes in inflation, Changes in GNP, Changes in investor confidence due to changes in default premium in corporate bonds, changes shift in the yield curve. The CAPM can be used in several purposes. For example, Portfolio evaluation, Making Financing decisions, Valuation of stocks, Value of Companies, Capital budgeting, CAPM gives the rate to discount expected cash flows, Mergers and acquisition etc. with the passage of time certain issues have been identified, which are not discussed by CAPM. For example, CAPM assumes that asset returns are jointly normally distributed for random variables. But often returns are not normally distributed.

The above mentioned discussion has indicated that asset pricing mechanism has a long debate. Only few studies on CAPM and Fama and French three factor model have been conducted in Pakistan. However, information efficiency factor R square is not explored. This study is an effort to explain role of information efficiency in explaining returns in Pakistani market.

1.2 Problem statement

Informational efficiency plays a vital role in price discovery of assets. Informational efficiency is dynamic phenomenon and market reactions are diversified. Most of the work in this domain is focused on the presence of different forms of market efficiency. However, factors determining the quality of information environment remained less attended in general and this area is specifically ignored in emerging markets like Pakistan. Therefore, no consensus exists about drivers of quality of information environment and their influence on SPS at company level. Similarly, firm specific variables based model for exploring information environment quality practically does not exist for emerging markets like Pakistan. Development of such model is helpful in raising the confidence of investor in estimation of market behavior. Only few studies have investigated the CAPM and Fama and French three factor model for valuation of assets. If there is any difference in the information quality, then there is additional risk and it should be priced. So, on the basis of information efficiency a factor based on information is explored in the context of asset pricing. Similarly, in global perspective the role of market efficiency and information quality in attracting foreign investment is also debatable and needs further insight.

1.3 Research questions

This study has the following research questions:

1) Whether Pakistani stock market is weak form efficient?
2) Whether company specific information is priced?
3) Which attributes of financial environment are more important in Pakistani equity market?
    i. How does institution investor affect stock price synchronicity?
    ii. What is the impact of age on stock price synchronicity?
    iii. Whether trading cost has an effect on stock price synchronicity?
    iv. Is there any role of size in explaining stock price synchronicity?
    v. How does book to market ratio affect stock price synchronicity?
    vi. What is the role of liquidity in explaining stock price synchronicity?
    vii. Is there any role of illiquidity in explaining stock price synchronicity?
    viii. What is the impact of stock returns on stock price synchronicity?
4) Is there any difference in stock price synchronicity across the industry in Pakistani equity market?
5) Which attributes of financial environment are more important to attract foreign investment in Pakistani equity market?
6) Is there any difference in foreign investment across the industry in Pakistani equity market?
7) Is SPS systematic risk?
8) How information efficiency premium affect the equity market returns in Pakistani equity market?

1.4 Research objectives

This study aims at to pursue the following objectives:

1) To test weak form of efficiency in Pakistani equity market.
2) To see the price adjustment dynamics of Pakistani equity market.
3) To explore role of information environment quality in explaining stock price synchronicity.
4) To provide insight about role of information environment in attracting foreign investment.
5) To develop an asset pricing model based on information efficiency premium for Pakistani equity market.
6) To facilitate the investors in making economic decision on the basis of informational dynamics of the market.

1.5 SIGNIFICANCE

This study makes a substantial contribution to the existing literature by providing the evidence about information environment quality in general and Pakistani equity market particular. Because, Pakistani market is an emerging market during last decade phenomenal growth is observed, but at the same time market saw number of ups and downs. It is generally considered as high risk and high return market. The market also attracted foreign investment during last decade. But, it is also criticized that foreign investment is a source of volatility in market. So, the questions about the quality of information environment have also been raised. These unique conditions of the market demand that price adjustment dynamics should also be explored in detail, so that investor can get better insight regarding the dynamics of market. In developed markets like, US, UK, Japan etc., any information is quickly incorporated in the security prices and markets are considered more efficient.

In case of an emerging market like Pakistani stock market the situation may be different due to different political, social and economic conditions of the country as compare to developed countries. The empirical literature states that an established and emergent stock market is an indication of economic growth. When social, economic or political condition of any country changes, it affect the performance of stock market. In this context, Pakistan faces these types of changes in recent past and it is also observed that these changes have linked with fluctuation of Pakistani stock market. So, it is important that quality of information should be investigated. Numbers of studies explain the market efficiency in developed countries. In efficient market, securities quickly respond to any positive and negative information. This study not only provides insight regarding the efficiency of the market, but also contributes towards body of knowledge by explaining the determinants of SPS at firm level and industry level. The quality of information is also examined by a set of company specific variables. This study may be pioneer work on firm specific data in the said direction.

The findings of this study are helpful in number of ways: first, this study contributes towards the literature of “Efficient Market Hypothesis” by providing empirical evidence from an emerging market. Secondly, it highlights the key elements of stock market that should be underlined in the process of security selection by the investors, decision makers and policy makers. Thirdly, it explains the role of information environment in attracting the foreign investor. Fourthly, this study adds the role of information environment quality in explaining the equity market returns along with price adjustment dynamics of Pakistani equity market.

1.6 Plan of the study

Chapter – 1 Discusses the introduction to this thesis

Chapter – 2 Provides a brief overview of empirical work done in the developed and emerging markets.

Chapter – 3 Deals with methodological issues. It provides information regarding data used in study, sources of data and statistical procedure used to investigate the data behavior.

Chapter – 4 Consists of the results and discussion.

Chapter – 5 Comprises of Conclusion and recommendations.

CHAPTER 2

2. LITERATURE REVIEW

2.1 TESTING MARKET EFFICIENCY

Role of information in determining prices is an undoubted fact in financial markets. In existing literature, several empirical and theoretical studies discuss the role of EMH. Fama (1970) has presented the theoretical foundation of EMH. According to Fama (1970) "financial asset prices reflect all the relevant historical and current information that they incorporate every piece of predictable information into unbiased forecasts of future prices." Release of any news induces information to financial markets and the impact of such news depends upon the intensity of the news in both directions (Reilly and Brown, 2011).

Fama (1970) has also categorized market efficiency in three types i.e., past prices (weak form of efficiency), public information (semi strong form of efficiency) and private information (Strong form of efficiency). Later, Fama (1991) has documented that strong form of market efficiency is extreme form, because it implies that important corporate office information about their own company to be captured by stock prices (e.g., a pending takeover bid or a dividend increase). This information is fully incorporated in financial assets prices with the very first trade, before it is publically announced (Megginson, 1997).

Number of studies (Kendall and Hill, 1953; Osbone, 1959; Robert, 1959 and Fama, 1970) rejects the hypothesis in developed economies, that fluctuations in equity prices are not predictable on the basis of historically available price information. Whereas, some studies observe that these developed economies have power to predict changes in future prices (Poterba and Summers, 1988; Fama and French, 1988). Dyckman and Morse (1986) have stated that "***the stock prices variations and direction of the price changes are random, with the help of available information at any given point of time***".

Despite of developed economies different studies in rest of the world in both emerging and developing markets also provide mix results. First group reports that these markets are weak form efficient (Barnes, 1986; Dickinson and Muragu, 1994; Ojah and Karemera, 1999) and the second group provides the evidence that these markets are not weak form efficient (Cheung, Wong and Ho, 1993). Fluctuations in stock prices are random does not mean it will change without any reason; these changes are based on some reason. There must be some factor influencing the variations on the prices and empirical evidence has been presented to prove this hypothesis. There are different methods of testing weak form of efficiency as discussed below.

2.1.1 Serial Correlation

Serial correlation test has two types parametric (autocorrelation function) and non- parametric (Runs test). It measures the relationship between two data sets which are for different constant time periods; it can also be called as the first order in case of the number of separated period is one. Kendall (1953) investigates long term and short term movements in New York stock exchange. He finds that movements in these stocks prices are random, no serial correlations, and report no discernible pattern.

Fama (1970) argues that in weak form of efficiency prices must release all historical information as it is revealed by using Random walk Model (RWM) and Fair game model. Rather than using serial covariances of returns that are used by Samuelson (1965) and Mandelbrot (1966), he has used serial covariance's for all lags and all lagged values of "fair game" with unconditional expectation of and find no evidence of substantial linear dependence.

Solnik (1973) inspects the RWM in stock markets of 8 European countries with 234 securities by using individual security rather than stock market index. Results of this study show that European markets depict more visible deviation from RWM than the US market. Sharma and Kennedy (1977) and Barnes (1986) report that Bombay stock index and Kuala Lumpur stock market is weak-form efficient. Whereas, Summers (1986) has challenged the statistical tests like autocorrelation has little power to evaluate, because these tests are designed for short horizons and only for speculative markets. He argues that common models take long time horizons and this study has empirically showed that fundamentally prices have slowly crumbling stationary components and short horizon returns have significant importance to account for.

Summer (1986) argues that long horizon returns are important for mean reverting price adjustment component and gives a clearer impression. While the slowly decay component can be traced from negative autocorrelation in returns. In response, Fama and French (1988) show mean reverting component of stock prices and reports that 40% of the variation of long term holding returns in US stock market are predictable from the information of past returns. Hamid et al. (2010) explore the weak form efficiency in monthly stock returns for 14 Asia-Pacific stock markets for the period of 2004 to 2009 by using parametric and non-parametric Tests. Results reveal that these markets do not follow random walks and market participants having the opportunity of arbitrage profit. Aumeboonsuke (2012) examines six ASEAN stock markets for the period of 2001 to 2012 and results of this study suggest that markets are not weak form efficient.

2.1.2 Trading Rule Tests

The second method to test the weak form of efficiency is the Trading Rules test. The famous Trading Rule test is Filter Rule test, which states that if the stock prices are increases and higher than the previous low trend then it is bought as it may give the profit or earning and on the other end if it's lower than the previous high trend then it is sold in the market. Alexander (1961), Fama (1965) and Fama and Blume (1966) have found no abnormal returns by using trading rule test. Sweeney (1988) investigates Dow 30 with more Mechanical Trading rules than Fama and Blume (1966) and report significant abnormal returns.

Levy (1967) employs a different approach using the ratio of the current stock price to its average price in the market and reports no abnormal return. Jensen and Bennington (1970) use the same methodology and confirms the results of Levy (1967). Wong, Manzur and Chew (2003) conduct a study using technical trading rule test on Singapore Stock Exchange (SSE) regarding entry and exists from stock market. Results of this study indicate that SSE can earn significant profit by using technical indicators. Hudson, Dempsey and keasey (1996) use the methodology of Brock, Lakonishok, and LeBaron (1992) for UK stock market and suggest that technical trading rules have predictive power. They further argue that it is an indication to go for buying offer and low predictive power is an indication to go for selling signs offer. They present supporting evidence regarding weak form efficiency.

2.1.3 Variance Ratio Tests

Variance Ratio Test compares the variances of two samples; it is proposed by Lo and MacKinlay (1988) and commonly known as F-test. Lo and MacKinlay (1988) examine US equity market using 1216 weekly returns for the period of 1962-1985 and sub-periods of 608 weeks on aggregate returns indices (both equally and value weighted). Results of this study reject the null hypothesis for both sample period and sub-periods.

Poterba and Summers (1988) examine weak form efficiency of US along with 17 other stock markets. Their findings suggest that in short run intervals there is positive serial correlation, but in long run negative correlation exists. Ojah and Karemera (1999) investigate random walk of Latin American emerging equity markets. Documented results suggest that these markets follow random walk and are weak form efficient. In Latin American equity markets, investors cannot get the benefit from historical information.

Abraham, Seyyed and Alsakran (2002) investigate three gulf stock markets (Kuwait, Saudi Arabia, and Bahrain) and also estimate true index by correcting infrequent trading effect by employing the methodology of Beveridge and Nelson (1981). The results of this study suggest that these markets are not following random walk. But, using true indices the results of weak form efficiency and RWM have been changed for Bahrain and Saudi Arabia. Buguk and Brorsen (2003) test weak form efficiency of Istanbul Stock exchange. Results reveal that all indices follow random walk, whereas nonparametric test rejected random walk in some series. Chakraborty (2006) investigates weak form efficiency of KSE for the period of 1996 to 2005 overall and two sub-periods (1996-2000 and 2001-2005) by using daily stock index. Variance ratio test reject the hypothesis for overall period but accepted only for second sub-period.

2.1.4 Cyclical Tests

The cyclic behavior of time series is observed with the help of cyclic test. Different statistical techniques are used to test cyclic test spectral analysis is one of them (Granger and Morgensterm, 1963). Several studies have documented the effect of the stock behavior in different terms by using cyclic test (Cross, 1973; French, 1980; Gao and Kling, 2005 and Doyle and Chen, 2009). They try to examine the January effect, Monday and Friday effect along with day, week and month for stock market within the year. They have found comprehensive results in support of these hypotheses. Cross (1973) has documented the effect of Friday and Monday for the period of 1953 to 1970. French (1980) examines the weekend effect and reports the expected return for Monday is significantly negative and Monday effect is three times with reference to other days of the week.

Gao and Kling (2005) examine the calendar effects of monthly and daily for Shanghai stock market and finds highest returns are earned during march and April because year end in china is February and Friday is also found profitable. Chinese investors misuse business funds for short term speculations because they are part time speculators. Apolinario et al. (2006) investigate 15 European stock markets and finds significant weekday effects for only two markets. Doyle and Chen (2009) investigate 13 stock indices of 11 countries for the period of 1993 to 2007 and report wandering weekday effect but the day is not found fixed. Like Monday or Friday is not a fixed profitable day and the results of general weekday effect is found significant. Thus stock markets are found inefficient.

2.1.5 Research Hypothesis for Weak form of efficiency

Fama (1970) defines weak form of efficiency that "financial asset prices reflect all the relevant historical and current information that they incorporate every piece of predictable information into unbiased forecasts of future prices". Number of studies (Kendall and Hill, 1953; Osbone, 1959; Robert, 1959 and Fama, 1970) rejects the hypothesis in developed economies, that fluctuations in equity prices are not predictable on the basis of historically available price information. Whereas, some studies observe that in some economies historical prices have power to predict changes in future prices (Poterba and Summers, 1988; Fama and French, 1988). Previous studies have employed different statistical tests including parametric and non-parametric tests for examining random walks and present mixed results.

This study also employs various tests suggested by past studies. These tests includes parametric and non-parametric tests for examining random walks i.e., Jarque-Bera and Kolmogrov-Smirnov (KS) test for normality, autocorrelation and Run test for autocorrelation, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) for stationarity and multiple variance ratio (MVR) tests (Fama, 1970; Barnes, 1986; Dickinson and Muragu, 1994; Ojah and Karemera, 1999 and Hamid et al. 2010). Number of studies report that these developed markets are weak form efficient (Barnes, 1986; Dickinson and Muragu, 1994; Ojah and Karemera, 1999) and number of studies report markets are not efficient (Alexander, 1961; Fama, 1965; Fama and blume, 1966; Levy , 1967; Jensen and Bennington, 1970 and Hamid et al., 2010).

H1: Pakistani stock market is weak form efficient.

2.2 Stock price synchronicity, Foreign Investment and Information characteristics:

2.2.1 Information asymmetry and Capital markets

Information asymmetric paradigm is linked with seminal work of Akerlof (1970) on used cars and some studies of market microstructure which have analyzed the stock markets' characteristics that enhance or diminish insider trading. Akerlof (1970) has theoretically linked information asymmetry and market value. The principles derived in his study generalize to any market setting that is characterized by asymmetric information and his discussion focuses on used cars (lemons). In assessing the value of a firm, if there is asymmetric information present (i.e. if insiders know something that outside investors do not), then the market value of the share may not reflect the intrinsic value of the share.

Furthermore, if investors are not capable of differentiating between low and high quality firms (i.e. lemons), then they will only be willing to pay an average of the share prices for both the firms. Hence, this average price will "undervalue" the good quality firms and "overvalue" the bad quality firms and creates a pooling equilibrium. It has been documented that this pooling equilibrium in capital market will lead to an inefficient allocation of capital because high quality firms do not prefer to issue any new equity, while low quality firms want to issue too much equity (Fox, 2011). In other words, only low quality firms (i.e. lemons) will be sold, in turn no capital will be allocated to high quality firms, and as a result social welfare will suffer.

After the Akerlof's (1970) seminal paper, Bagehot (1971) has also reported the adverse selection as a basic reason of illiquidity in capital markets, which takes place in the presence of information traders. After these findings researchers construct asymmetric information models of the trading process, and use these models to illustrate that insider trading creates a lemons problem by impairing market liquidity. Thus, later on in this stream of the literature researchers get focused on explaining how the low quality firms (lemons) problem is related to the market microstructure level. Spence (1973) refers to a similar mechanism when workers sell their labor to firms and have private information about their skills, while Rothschild and Stiglitz (1976) analyzes the insurance market in which private information is instead on the side of the buyer who is better aware of her health condition, or driving skills than the insurer.

For the first time Kyle (1985) has presented a price formation model of trading that allows an examination of the information aspect of securities prices, the characteristics of market liquidity and the value of private or special information to an insider. In the Kyle's model there are three types of traders, a risk neutral insider, several competitive risk neutral market makers and uninformed noise traders who trade randomly. Market makers or dealers serves as an intermediary between buyers and sellers and secures their revenue by incorporating a spread into quoted prices. The insiders generate profits from their informational advantage, where noise or uninformed traders provides camouflage which hides insiders' trading from market maker. In this situation the market makers rationally interpret the information contained in the order flow and then sets price to achieve zero profit from trading. The order flow is aggregate of quantities demanded by noise and informed insider for trades. In a nutshell, market makers trade a break even and insiders earn a profit at the expense of noise or uninformed traders.

Demsetz (1986) built upon Kyle's model to demonstrate that, in the absence of robust regulations on insider trading, outsiders will effectively create a natural defense mechanism against harmful insider trading by demanding higher expected returns on stocks. However, market microstructure theorists have also been argued that some asymmetric information is actually a prerequisite for markets to function (Milgrom & Stokey, 1982 and Biais & Hillion, 1994). Subrahmanyam (1991), Harris and Raviv (1993) and George, Kaul and Nimalendran (1994) are subsequent researchers who extended the work of Kyle by developing new price formation models. All these authors have argued that in informational asymmetry settings, trading servers to incorporate all relevant information into market prices in a way that compensates insiders for their informational advantage while still providing returns to dealers or market makers. However, the market is unpredictable, so the dealer is not able to distinguish whether he or she is dealing with an insider or noise trader at any particular point in time. As a result, the asymmetric information generates the problem of adverse selection in capital markets.

A key portion of the dealer's cost is information trading cost which reflects this problem, because to avoid being a net loser in the market, the dealer must account for expected losses due to transactions with informed insiders. In most of previous studies, the spread is used as a proxy for liquidity costs, where the spread decreases the liquidity in capital markets with the degree of information asymmetry. It is reported that a higher degree of information asymmetry leads to a larger spread and this is bad for liquidity traders, because they not only lose on average to insiders, but they also are charged a higher spread for each trade that they make, even though insiders are the actual source of the cost (Diamond & Verrecchia, 1991).The existing literature also suggests that there is not always necessarily conflict of interest between two parties, for instance, insiders and outside investors (Denis et al. 2002). Insiders take informational advantage by purchasing undervalued "value stocks" and by selling overvalued "growth stocks" (Rozeff & Zaman, 1998). Insiders trading have both additional information about future cash flows and contrarian beliefs of insiders (Piotroski and Roulstone 2004).

Information efficiency deals the adjustment of prices with the arrival of new information. The arrival of information is based on set of attributes and these attributes of information are costly. Optimal resource allocation in a market based economy is dependent on informationally efficient prices, but at the same time, prices do not reflect all available information due to higher cost of information acquisition (Grossman and Stiglitz, 1980). So, it is more important to develop a measure of information incorporation on the basis of particular characteristics that will help trader to get information without bearing cost of information. If all traders are rational and all relevant information is publically available, then there is a possibility that prices may be informationally efficient. So, the characteristics of information environment will be observed by proxy variables.

It is not possible to attain informational efficiency with costly private information (Grossman and Stiglitz, 1980). Roll (1988) reports that public news events do have little impact on volatility. So, along with public news event this study will also focus on other characteristics for detailed information incorporation of private information. Information environment quality is captured by the association of SPS using market model R square and the quality of information variables. Following section provides the association of SPS, foreign investment and the quality of information variables.

2.2.2 Dependent Variables

2.2.2.1 Stock price synchronicity

Roll (1988) uses a regression of company returns on market and industry returns and suggests the coefficient of determination R square of this regression as an inverse proxy for firm specific information. In addition, low (high) R square shows that company returns are being explained less (more) by market than to firm level factors. To test the unexplained portion i.e., firm level information, Roll employs the regression controlling observations on the dates on which information about the firm or its industry appeared to the public. If the residuals are capturing firm level information, then the R square of the second regression should be significantly higher. Despite later efforts to improve the methodology, Roll’s conclusion remains unchallenged. Subsequent firm specific and cross country research studies appear to support these results.

West (1988) provides a theoretical model where increased firm level return instability is related with less firm level information and more noise in returns. He empirically tests his model and reports that idiosyncratic return volatility is positively related with non-fundamental factors. The study suggests that less information incorporation results in higher variations in stock returns and thereby reduces R square. Whereas, Morck et al. (2000) opens new dimensions of research by contradicting West (1988) findings and argued that R square can be used as a measure of information efficiency and documented that rapid information incorporation resulted in reducing R square. Recent studies in literature have used the same methodology proposed by Morck et al. (2000) based on market model R square of asset pricing regressions as a proxy of SPS (Durnev et al., 2001; Durnev et al., 2003; Fox et al., 2003; Piotroski and Roulstone, 2004 and Kelly, 2007). A noteworthy difference in ownership structures, obligatory and voluntary information flows, trading activity, and market frictions across countries are reported to influence the price discovery in different markets.

Piotroski and Roulstone (2004) define SPS as “the extent to which market returns explain variation in firm level stock returns”. The study tests the association between synchronicity and movements of informed market participants including, analysts, insiders, and institutional investor and report as the movements assumed by informed traders. Numerous studies have found that capital investment in companies or countries is more responsive to variation in stock returns and low R square (Wurgler, 2000; Durnev, Morck, and Yeung, 2004 and Chen, Goldstein, and Jiang, 2006). In contrast, several studies have found inconsistent relationship between R square and information incorporation (Chan and Hameed 2006; Ashbaugh, Gassen and LaFond 2006; Griffin, Kelly and Nadari 2006 and Kelly, 2014). Theoretically, several researchers argue that interpretation of information efficiency by R square is difficult to measure with standard models (West 1988; Campbell, et al., 2001 and Peng and Xiong, 2006).

Far less theoretical work has been done on R square as a measure of informativeness. However, two exceptions are Jin and Myers (2006) and Dasgupta et al. (2010), both assume a simple cash flow generating process that includes information shocks. Dasgupta et al. (2010) argue that in an efficient market stock prices only respond to that announcement that is not anticipated in advance. As firm improves the information environment surrounding, that results the availability of firm specific information to all market participants. So, market participants improve their expectations and predictions about the occurrence of future firm specific events. Thus, the likelihood of these predictive events is incorporated in the prevailing prices and on the actual occurrence of this event in future the prices do not respond to that news. Therefore, more informative stocks today have low firm specific variation in future and have high R square. Jin and Myers (2006) examine the relationship between corporate transparency and SPS. Their analysis shows less transparency between insiders and outsiders thus making the prediction about those stocks with high SPS are more likely to have large negative returns and more transparent environment provides more firm specific information to the investor and that reduce future variations in price. Efficient pricing and disclosed information of stocks help the existing and new investor for making better investment decisions. So, quality of decision is a sign of quality of information.

Existing literature also reports inconsistencies in the conservatism of accounting information, value relevance, and the timeliness across countries (Ball, Kothari and Robin, 2000 and Ball, Robin & Wu, 2003). So, the hypothesis is stock prices incorporates information with similar precision across countries. Ashbaugh-Skaife et al. (2006) confirm the results of Morck et al. (2000) for a small number of countries. However, they document the non-existence of an association between SPS and firm level variables that might be expected to capture the quality of the firm's information environment. They determine that SPS is not associated with firm level information and, therefore, cannot be used to compare countries from an informational perspective. Chan and Hameed (2006) assume that SPS is positively related to the extent of analyst coverage, firm size, and trading volume.

In subsequent study, these findings are supported by Kelly (2007), who argues that the SPS is inconsistent to firm specific fundamentals. This study suggests that R square is direct proxy of information environment quality. He suggests that R square should be higher with high liquidity, greater analyst coverage, large size, greater age, large institutional holding, lower transaction cost, and large information events. Because all these attributes disseminate the information into market. Roll (1988) found the effect of public news on the volatility of returns, but this impact is relatively small. Due to this reason, microstructure variables should be used for information incorporation (Kelly, 2007).

Numerous studies have used SPS as an inverse measure of the relative amount of firm level information incorporated in price. Previous studies argue that SPS is associated inversely with firm level information that influences prices. Durnev et al. (2003) discuss that firm with low SPS is associated with more future earnings information being reflected in returns. They report that in U.S., firms with low SPS have more future earnings information revealed in stock prices. Firms revealing low SPS imply that their price depends less on market movements because there is a greater amount of firm level information that market participants rely on. However, this may not true due to non-fundamental variables. Thus, a lower SPS does not necessarily means a high degree of firm specific information. This is because noise (either from the trading process or from non-information based trading) will also increase idiosyncratic return volatility, hence, reduce R square (Johnston, 2010).

Chen et al. (2007) suggest that the monitoring of investors have two main objectives, one is to collect firm specific information and the other to influence management to protect property rights of investors. In case of high investor monitoring, the managers must overcome their control, which, in turn, decreases the SPS. However, SPS would increase in weak investor monitoring as managers are able to increase their control. Literature also documents that if stock returns do not capture information in similar manner across countries, then SPS is inadequate in its use as a measure of the information revealed in stock prices. Proponents of this research stream are examining whether the synchronicity measure reveals information efficient prices at the firm level in U.S. setting.

Wei and Zhang (2006) explain the possible causes for increased idiosyncratic return volatility overtime in the U.S. and find that the volatility in firm specific variables has increased overtime. However, they further suggest that the relationship between variations of firm specific information and idiosyncratic return volatility that casts doubt on information based explanation for decreasing values of SPS. Rajgopal and Venkatachalam (2005) report a positive link between idiosyncratic return volatility, information risk, and analyst forecast dispersion. Their results are consistent theoretical work of Pastor and Veronesi (2003), who argue that uncertainty about firm specific variable effect idiosyncratic return volatility. This study provides further evidence against the information based explanation of the synchronicity measure.

2.2.2.2 Foreign investment

Increasing trend of portfolio diversification provides opportunities for countries to attract foreign investment. Upal (1993) argues that international portfolio diversification also provides an opportunity for foreign investor to diversify their unsystematic risk and expand their portfolios. Foreign investors are relatively at informational disadvantage as compared to domestic investor, and cost of investing is higher for them. Leuz, Lins and Warnock (2010) report that investors invest less in those foreign stocks, having high informational asymmetries and thus, are required high monitoring costs. But, there exist low correlation among asset returns of emerging markets' stocks and international stocks that provide high return at low risk.

Still some restrictions are imposed by developed countries, whereas emerging economies permitting foreign investors by relaxing foreign investment barriers. Because, foreign investment is helpful in the development of host country's capital market and provides numerous benefits to that country (Berko and Clark, 1997 and Duasa and Kassim, 2009). Levine and Zervos (1996) state that foreign investment increases the liquidity of capital market and resulting in a deeper and broader market. Grubel (1968) investigates that cross border diversification provides capital gains to equity portfolio investor. The positive contribution to increase liquidity, development of capital market and economic growth of host economy, it is necessary to attract foreign investment. So, it is required to enhance the confidence of foreign investor, with higher industrial standards, better corporate governance practices and greater transparency in host country, which will be resulted in strong investor protection (Feldman and Kumar, 1995 and Shinn, 2000).

If the price discovery process is accelerated and market speedily adjust the information that means market exhibit true information that attract foreign investment. Naughton (2007) suggests that some unique domestic characteristics of emerging markets like insider control and powerful role of government policy create informational asymmetry to foreign investor. Leuz, Lins and Warnock (2010) examine foreign investments and country characteristics, results of this study suggest that US investors avoid investing in those countries that have poor legal and informational framework. Number of studies captures the effect of political and country factors on foreign investment (Branson, 1968; Kreicher, 1981; Lay and Wickramanayake, 2007 and Thapa and Poshakwale, 2012).

Chang (2010) reports that in emerging markets the foreign investors are at informational disadvantage due to lack of information and local contacts. Asymmetric information is considered as one determinant for foreign investment by using different company specific variables. An aversion from foreign investment may also be due to information asymmetries, low financial transparency and openness of financial statements (Mondria and Wu, 2010). Numbers of studies have reported “Home bias” and firm specific variables do have more importance for foreign investor. Kang and Stulz (1997) recognize “home bias puzzle” of foreign investor in Japanese stock market that comprises on explicit and implicit barriers. Explicit barriers cannot completely explain portfolio allocation (French and Poterba, 1991; Cooper and Kaplanis, 1994; and Tesar and Werner, 1995). These explicit barriers are withholding tax, control on foreign exchange and other directly measureable impediments. Implicit barriers are comprised on political risk, sovereign risk and informational asymmetries. This study reports that large firms having low leverage and high export ratios (higher foreign sales) attract foreign investor.

For Swedish stock market, Dahlquist and Robertsson (2001) examine foreign ownership using same variables as earlier used by Kang and Stulz (1997). In this study they have used data for the period of 1991 to 1996 and results suggest that foreign investors invest in those firms having large size, high liquidity and low leverage. However, globalization becomes an important source of financing from many capital markets and investors have started to allocate more resources in other capital markets (Leuz, Lins and Warnock, 2010 and Bekaert, Harvey and Lumsdaine 2002). Cheo, Kho and Stulz (1999) find that foreign investors in Korean stock market have information disadvantage as compare to domestic investors. Merton (1987) and Huberman (2001) argue that investors prefer securities they know about. Further studies focus on firm specific variables to determine foreign capital flow, i.e. liquidity, firm size, performance, corporate governance, dividend yield, Current ratio, book to market ratio, debt to equity ratio, Export to total sales, ROI and ROA etc., and volatility (Dahlquist and Robertsson, 2001; Almazan et al., 2005; Liljeblom and Loflund, 2005; Chan, Covrig, and Ng, 2005; Li et al., 2006; Carlos and Lewis, 1995; Chuhan, 1994; Kang and Stulz, 1997; Brennan and Cao, 1997 and Liljeblom and Loflund, 2000).

Short, Zhang and Keasey (2002) examine institutional ownership and dividend payout ratio in United Kingdom stock market and report a significant and positive relationship. Lin and Shiu (2003) investigate the determinants of foreign ownership using different characteristics of company specific fundamentals of information asymmetry in Taiwan stock market for the period of 1996 to 2000. Results reveal that from the information asymmetry perspective foreign investors prefer to invest in those firms having large size, high export ratios, high beta stocks and low BTM ratio. Jeon, Lee and Moffett (2011) examine the relationship between foreign ownership and payout policy of the Korean firms for the period of 1994 to 2004. The results of this study suggest that foreign investor wish to invest in those firms that have high dividend payout ratio. Because, investors in Korean stock market are institutional investors and they like more dividend clienteles and monitoring incentives. Conversely, foreign investors do not prefer to invest in those firms that buy back the shares. On the other side, this study finds that domestic investors have no significant relationship with payout ratio.

Covirg, Lau and Ng (2006) explore different characteristics that domestic and foreign fund managers prefer using the data of 11 developed markets. This study suggests that foreign fund managers are on information disadvantage as compared to their domestic investors. So, the ownership held by the foreign fund manager is based on the high export ratio i.e. the foreign sales size and foreign listing. Ko, Kim and Cho (2007) investigate foreign and institutional ownerships' firm characteristics for Japanese and Korean stock market for the period of 1993 to 2002. For both markets, this study reports the same results regarding large size, high return on equity and low BTM ratio stocks are preferred by the investors. He et al. (2013) report a positive relationship between foreign ownership and information characteristics. This study provides further evidence against the information based explanation of the foreign investment at firm level.

2.2.3 Independent Variables

2.2.3.1 Liquidity

Liquidity is generally related to stock returns to which an asset can immediately sold after purchase without any discount. These losses are due to the change in price or transaction cost. Liquidity in financial markets is defined as "ease of trading" (Amihud, 2002). Damoradan (2005) states that "***When you buy a stock, bond, real asset or a business, you sometimes face buyer's remorse, where you want to reverse your decision and sell what you just bought. The cost of illiquidity is the cost of this remorse***".

Numerous proxies for liquidity, illiquidity and cost of illiquidity are used in the literature. Amihud and Mendelson (1986) were the first to investigate the role of liquidity by using bid ask spread in asset pricing. Datar, Naik and Radcliffe (1998) confirm the role of liquidity in the stock prices with the help of a new proxy which is known as the turnover rate. They have used the same framework proposed by Amihud and Mendelson (1986) by using individual stocks. The findings of this study support the argument that the stocks which are less liquid should yield higher returns in order to cover the loss of illiquid stock loss. Hence it can be concluded that a stock which has low turnover rate should return a high premium. Amihud (2002) has developed a measure based on price sensitivity to traded volume, which is commonly known as Amihud Illiquidity measure. Baruch and Saar (2009) argue that a stock may attract more trading volume in case it is listed on a market where related stocks are traded, or the market that the stock is more correlated with.

2.2.3.2 Attention and Cost of information

Cost of information is a major portion which will allocate by traders for collecting information, so they optimally allocate recourses and get the important information only (Grossman, 1976). Analysts' reports are used by variety of investors, due to the convenient and lower cost availability for information acquisition. Kelly (2007) argues that analysts prepare their reports in light of maximum information available to them. This detailed analysis helps investor to get the information and lower the cost of accessibility. The acquisition of information is relatively costly for small and younger firms. Kim, Lin, and Slovin (1997) provide an evidence that rapid incorporation of private information is promoted by analysts and results suggest that buy recommendations have a positive impact on firm value, in lined with the findings of Womack (1996). To support their argument Frankel and Li (2004) report that the insiders earn less profit when there is great analyst coverage.

Hong, Lim, and Stein (2000) find that in low analyst coverage momentum strategies performed better and reported that the effect of analyst coverage in past losers is greater than past winners. Bhushan (1989) has stated that analyst coverage and firm size is strongly correlated. Merton (1987) reports that more investors follow large firms than small and young firms. If investors are less informed about stocks, then they are not able to find out mispricing in stock prices. In addition, Merton believes that investors may not go for the newly established firms as the traders are unaware of the stock prices, so the mispricing cannot be discovered on their stock returns.

Ho and Michaely (1988) have investigated the optimal behavior of an individual both in acquiring and determining the information incorporation in stock at equilibrium with information cost by using 29 newspaper commentaries for the period of 1982 to 1984 by choosing two national level newspapers in US. In context with equilibrium, large firms are more efficient and less costly than small firms in acquisition of information, so, investors optimally choose and learn more about large firms. When information cost is less, market forces would lead stocks toward information efficiency. Whereas, inefficiency of stocks gives an opportunity to some participants of market to manipulate the market and this manipulation may be troublemaking for the process of price information. Moreover, they argue that the information gathering for the small and new firms is comparatively difficult as they do not have sufficient resources. Those companies with new information do not have historical performance and the uncertainty for such kind of firms is high and thus the investment may be low. Further, findings suggest that firm's size is positively related to price change. Different proxies are collectively used in literature to determine the level of intention: analyst coverage, size, and age.

2.2.3.3 Informed trader

Institutional investors hold a greater portion of outstanding shares in well-known stocks. Sometimes a nominee of a company may be a director of company in which investment has been made. Institutional investor is assumed more informed trader due to more optimal resources and huge budgets for analysts' teams as compared to individual investor to put their money in right boxes. So, institutional investors are used as a proxy for informed traders. Trading by institutional investor is a content of information and it helps to speed up the process of price adjustment (Sias and Starks, 1997).

Cohen, Gompers, and Vuolteenaho (2002) investigate cash flow news, stock returns, and trading made by institutions by using vector autoregression. The study reports that institutions do not follow the price momentum strategies. When there is no news regarding cash flows and prices go up, institutions sell their stocks form individuals and vice versa. Whereas, institutional investor reacts differently in the presence of cash flow news. They buy stocks with positive cash flow news and sell the stocks with negative cash flow news.

Sias (2004) analyzes institutional herding for US equity market for 60 quarters from March 1983 to December 1997. The results of this study suggest that institutional herding is compact information in it and leads stock prices towards their fundamental value. In addition, institutional investors have cost advantage in comparison with individual investors. So, institutional investors depict the information from each other and follow their trades. Chakarvarty (2001) investigates institutional trades and non-institutional trades for US equity market by using data of trades, consolidated quotes, order database, and audit file for 63 days from November 1990 to January 1991. The findings of this study document that trading made by individual investors have less impact on stock prices as compare to institutional investor trades.

2.2.3.4 Costs of Trade

Trading costs are frictions, which affect the momentum of incorporation of information into stock prices. Because any change will happen in the market will not significantly affect the prices of stocks, if trading cost is high. In other words, each change in the market will lead toward buy or sell of stock and it will increase trading with low trading cost, due to the fact investor will get gain or loss without paying a larger portion as transaction cost, that lead towards the fair price discovery process.

In past studies proxy variable are used for trading costs is spread plus commission. Bid ask spread decreases with the better disclosure provided by firms (Helfin, Shaw, and Wild 2000). Bhushan (1994) investigate trading cost with various variables that include share prices (inverse proxy of direct costs), trading volume (inverse proxy of indirect costs), and firm size (categories as; Small, Medium and Large firms). Lesmond, Ogden, and Trzcinka (1999) argue that proxy variables can only assert the effects of these variables, but cannot capture the effect of trading costs. They have developed a model using daily stock returns for US equity market for the period of 1963 to 1990. This model is based on number of zero returns. This study reports that more that 80% of daily returns are zero for small firms during the year and found 40% daily returns are zero for large firms during the year.

2.2.3.5 Book to market ratio

BTM ratio is measure of valuation and used to differentiate between value and growth stock. Dahlquist and Robertsson (2001) suggest that investors prefer to invest in growth firms. Whereas, Ferreira and Matos (2008) suggest that foreign investors prefer to invest in growth firms and local investor prefer to invest in value firms. Growth firms are those firms having low BTM ratio and value firms are those having high BTM ratio. The BTM ratio refers to book value of equity divided by market value of equity (Rosenberg et al., 1985). Stattman (1980) and Rosenberg et al. (1985) were the pioneer researchers who documented the relationship between expected returns and book-to-market ratio. Rosenberg et al. (1985) examined book-to-market ratio (book value of a firm to the market value of firm) of equity. Dasgupta et al. (2010) use reverse proxy of BTM ratio i.e., market to book ratio and results of this study report negative relationship between market to book ratio and SPS.

In this study these attributes include both public news and microstructure variables (liquidity, attention of investor, cost of information, informed trader and trading cost) are tested to capture the quality of information for Pakistani equity market. SPS should be higher with high liquidity, greater analyst coverage, large size, greater age, large institutional holding, lower transaction cost, and large information events. Because all these attributes disseminate the information into market.

2.2.4 Research Hypothesis for information environment variables and SPS

West (1988) presents a theoretical model, which says that firm specific return variations are linked with less information of firm specific variable and more noise in returns. While in empirical testing of West's model he reports that idiosyncratic return volatility is positively related to bubbles, fad and other non-fundamental variables. Greater SPS interprets that the value of R square is higher, which reflects less idiosyncratic return volatility and more market information and lower SPS interprets that the value of R square is lower, which reflects more idiosyncratic return volatility and less market wide information (Morck et al., 2000). That means the information of firm specific variables which accelerated trading activity and creates volatility in stock returns will result in decreasing the value of market model R square and those firm specific information impounds trading activity and brings stability in stock returns will result in increasing in the value of market model R square. Some studies suggest that behavioral factors i.e., herding, bubbles and other non-fundamental factors also affect stock return volatility (Shleifer, 2000) and eventually SPS is a useful to measure the firm specific information (Ashbaugh-Skaife et al., 2006).

Chan and Hameed (2006) suggest that greater SPS in emerging markets has two possible reasons. First, many emerging markets have similar quality of disclosure regulation as compared to developed markets and these regulations are not fully enforced. Secondly, these markets have concentrated ownership firm structure by founding families and government, no separation between voting rights and cash flow rights, and these firms are affiliated with large business groups through cross shareholding. This environment of controlling ownership encourages withholding the information and disclosing only selective information, so they can hide private information from outsiders and secrete the inference of valuation for their self-interested behaviors (Fan and Wong, 2005; Kim and Yi, 2006). Hence, the cost to acquire the private information is higher in these markets and informed traders have low profits in emerging markets and it may discourage informed trading and impound firm specific information incorporation in to sock prices and leading to higher SPS (Ashbaugh-Skaife et al., 2006).

Size and age are used to capture the attention of traders in this study. Large and old firms are more efficient and less costly than small firms in acquisition of information, so, investors optimally choose and learn more about large firms (Ho and Michaely, 1988). Big firms have generally richer information environment and should have to increase stock return variation and reduce SPS. So, the association between size and SPS would be negative. However, to some extent large firms reveal trends of macro-economic information and the price behavior of these firms induce similar market movements and resulted in high SPS (Dasgupta, 2010). These firms also have more diversified operations and have more synchronize trading with market resulting positive association between size and SPS (Piotroski and Roulston, 2004; Chan and Hameed, 2006 and Ashbaugh-Skaife et al., 2006). Older firms also have richer information environment and should have to increase stock return variation and reduce SPS. So, the association between age and SPS would be negative.

To detect the level of trading activities in firm stocks, three measures of liquidity are used i.e., Volume, Turnover rate and Value traded. In an information environment based analysis, trading activity should have to increase stock return variation and reduce SPS. So, the association between trading activities and SPS would be negative. However, if one assumes that SPS using R square is a proxy of noise trading and unrelated to firm specific variables, then the association of trading activity is expected to be positive with SPS (Ashbaugh-Skaife et al., 2006).

To detect the level of non-trading activities in firm stocks, two measures of illiquidity are used i.e., percentage of zero volume and Amihud illiquidity. In an information environment based analysis, non-trading activity should have to decrease stock return variation and increase SPS. So, the association between non-trading activities and SPS would be positive. However, Ashbaugh-Skaife et al. (2006) suggest that there are two potential reasons for negative relationship between percentage of zero volume and SPS. First, when firms have more zero return days, in this case number of observations of returns used in estimation market model R square reduces explanatory power of model and resulting in lower SPS and percentage of zero return going towards 1, when proportion of days of companies stocks do not trade. Secondly, the potential reason of negative relationship between SPS and percentage of zero return days would be the infrequent trading with small amounts and non-information based trading slightly immaterial trades. That will result in unrelated firm specific information and lower SPS.

Trading costs are associated with the cost of buying or selling the security. Trading costs are frictions, which affect the momentum of incorporation of information into stock prices. Any change in the market will lead towards buy or sell of stock. In an information environment based analysis, if cost of trading is higher that restricts the trading activity and reduces idiosyncratic return volatility and increase SPS. So, the association between trading costs and SPS would be positive. However, herding and noise trading the association of trading costs is expected to be positive with SPS.

Book to market ratio is used as valuation proxy, value firms have smooth operations and to some extent do not have any information that will surprise for market. Whereas, firms with high growth have potential of more firm specific information incorporation into stock prices (Gul, Kim and Qiu 2010). Piotroski and Roulstone (2004) report that decisions made by informed traders (institutional investors and analysts) are associated with SPS. Trading by institutional investor is a content of information and it helps to speed up the process of price adjustment (Sias and Starks, 1997). Daily, weekly, monthly returns are used as control variables. If there is a trading activity that generates fluctuation in firm's specific return and decrease SPS.

H2: There is an association between institutional ownership and stock price synchronicity

H3: There is an association between age and stock price synchronicity

H4: There is an association between trading cost and stock price synchronicity

H5: There is an association between size and stock price synchronicity

H6: There is an association between Volume and stock price synchronicity

H7: There is an association between Turnover rate and stock price synchronicity

H8: There is an association between value traded and stock price synchronicity

H9: There is an association between percentage of zero volume days and stock price synchronicity

H10: There is an association between illiquidity and stock price synchronicity

H11: There is an association between book to market ratio and stock price synchronicity

H12: There is an association between returns and stock price synchronicity

H13: There is a difference in stock price synchronicity across the industry

2.2.5 Research Hypothesis for information environment variables and foreign investment

As suggested by Chan and Hameed (2006) that in emerging markets, firms have concentrated ownership and these firms are affiliated with large business groups. These institutional investors have more informed trading and due to less information asymmetry perspective foreign investors prefer to invest in those firms having institutional holdings (Lin and Shiu, 2003). Trading by institutional investor is a content of information and it helps to speed up the process of price adjustment (Sias and Starks, 1997).

Size and age are used to capture the attention of traders and effect of informational asymmetries (Dahlquist and Robertsson, 2001). Large and old firms are more informational efficient and have less transaction cost than small firms (Liljeblomand and Loflund, 2005). So, the association between Size and age with foreign investment would be positive. Kang and Stulz (1997) and Batten and Vo (2010) suggest that foreign investor prefer to invest in those markets where explicit barrier are low e.g., low transaction costs. So, the association between trading cost and foreign investment would be negative.

Domowitz and Lee (2001) and Barron and Ni (2008) suggest that foreign investor are at information disadvantage due to information asymmetry and overcome it with greater trading activities. To detect the level of trading activities in firm stocks, three measures of liquidity are used i.e., Volume, Turnover rate and Value traded. So, the association between trading activities and foreign investment would be positive. To detect the level of non-trading activities in firm stocks, two measures of illiquidity are used i.e., percentage of zero volume and Amihud illiquidity. So, the association between non-trading activities and foreign investment would be negative.

Chan and Hameed (2006) suggest emerging market have disclosure regulation but do not fully enforced and these markets have no separation between voting rights and cash flow rights due to family and government ownerships. This environment of controlling ownership encourages withholding the information and disclosing only selective information, so they can hide private information from outsiders and secrete the inference of valuation for their self-interested behaviors (Fan and Wong, 2005; Kim and Yi, 2006). Hence, the cost to acquire the private information is higher in these markets and informed traders have low profits in emerging markets and it may discourage informed trading and impound firm specific information incorporation in to sock prices (Ashbaugh-Skaife et al., 2006).

Shleifer (2000) suggests that behavioral factors i.e., herding, bubbles and other non-fundamental factors also affect stock return volatility. Bennett et al. (2003) findings suggest that domestic and foreign institutional investors have changes their preference and now prefer to invest in smaller and risker stocks. Since, investment in these stocks provides an opportunity to exploit the market on their informational advantage. Due to herding effect and unrelated firm specific variables in emerging markets, the stocks are not in lined with trading mechanism rather linked with noise trading activities (Shleifer, 2000). Due to the fact trading activity is also expected to be negative with foreign investment; the association of trading costs is expected to be positive with foreign investment. Due to the uncertainty about size, trading activity, non-trading activity and trading cost no sign predictions are given. The coefficient estimates of book to market ratio and age are insignificant in all regressions. Daily, weekly, monthly returns are used as control variables. If there is a trading activity that generates fluctuation in firm's return and expected to have positive relationship with foreign investment.

H14: There is an association between institutional ownership and foreign investment
H15: There is an association between age and foreign investment
H16: There is an association between trading cost and foreign investment
H17: There is an association between size and foreign investment
H18: There is an association between Volume and foreign investment
H19: There is an association between Turnover rate and foreign investment
H20: There is an association between value traded and foreign investment
H21: There is an association between percentage of zero volume days and foreign investment
H22: There is an association between illiquidity and foreign investment
H23: There is an association between book to market ratio and foreign investment
H24: There is an association between returns and foreign investment
H25: There is a difference in foreign investment across the industry

2.3 Information efficiency premium and CAPM:

Corporate managers are always interested in information issues. Along with corporate managers, individual as well as institutional investors also give a suitable weightage to company specific information while selecting the portfolios of stocks or bonds. Information efficiency has presented a lot of discussion in financial economics, which is expected to affect an immediate increase or decrease in the stock prices. Asset pricing theory implies that expected returns on market securities have a positive linear relationship with market beta and market beta explains future expected returns. So, stocks with high return should have higher beta. Conversely, empirically evidences have provided by different studies and fail to find the variations in stock returns by following market beta alone.

Roll (1977) argues that market risk premium proxy of difference between market return and risk free rate does not capture true and complete market information and leads CAPM being invalid. Empirical literature identifies various anomalies which include size, BTM ratio, leverage, momentum, dividend yield etc. So, R square based premium may also help to capture the variations in portfolio returns as a proxy of information efficiency using asset pricing models as an additional factor.

Rich literature exists that identifies number of factors that influence equity returns. The significance of different factors explaining cross-sectional returns have contradicted the presence of single market factor CAPM based on mean variance theory. Numerous studies reject the single factor model and state that market risk premium does not capture full relevant information (Officer, 1973 and Breeden and Douglas, 1979). Fama and French (1992) investigate the relationship among Size, BTM, E/P and market beta in the equity market returns for NYSE, AMEX and NASDAQ from 1963 to 1990. This study uses portfolio betas to predict the stated variables by using second pass regression of Fama and Macbeth (1973). Results indicate that all relevant variables have significant power to predict equity returns except beta. Fama and French (1993) extend the previous study by using Black et al. (1972) time series approach both on stocks and bonds. Results reveal from the study report that size and BTM have significant impact on equity returns and bond default premium. Hence, suggests that three factor model consists of market premium should also be used size and BTM to predict future equity returns.

Fama and French (1995) investigate the behavior of equity returns by using size and BTM by using full and sub period sample regression. Results revealed from this study suggests that returns respond to the BTM ratio, and firms with persistent low earnings tend to have high BTM ratio and positive relationship with HML, whereas firms with persistent high earning have low BTM ratio and negative relationship with HML and BTM portfolios of small stocks are less profit able than big stocks. Chan et al. (1991) examine size, BTM, earning yield and cash flow yield for monthly equity returns of Tokyo stock exchange for the period of 1971 to 1988. This study has employed Seemingly Unrelated Regression (SUR) model and Fama and MacBeth (1973) methodology. This study finds BTM and cash flow yield are significantly positively related to expected average returns.

Daniel and Titman (1997) contradict the findings of Fama and French (1992, 1993, 1996) by using data from 1973 to 1993. This study reports that average equity returns are not function of loading factor of Fama and French. Davis et al. (2000) have extended the Daniel and Titman (1997) work and contradicts to their findings. In this study expected returns and factor loadings are examined after controlling size and BTM. In their study the argument of Daniel and Titman against Fama and French is rejected on the basis of low power of prediction due to short period sample of 20 years. Kothari, Shanken and Sloan (1995) argue that betas are estimated for short intervals and are biased due to using monthly returns rather than using annual returns for trading frictions and non-synchronous trading. They find a significant relation between beta and cross-sectional returns. Even in late 1920's and early 1930's the period of great economic instability and markets are found inefficient, the smaller firms are more influenced the returns than the larger firm.

Kothari and Shanken (1997) explore the relationship among BTM ratio, dividend yield and US equity market returns by employing Bayesian bootstrap procedure from 1926 to 1991. Results indicate that BTM ratio has a strong relationship for the sample period, but dividend yield and equity returns are found related for the period of 1941 to 1991 only. Chui and Wei (1998) have first time tested the multifactor model for Asian region including Hong Kong, Korea, Malaysia, Taiwan and Thailand from 1977 to 1993. A weaker relationship is found between portfolio returns and market betas, but finds BTM ratio and size significantly explained the stock returns variations. This study has also indicated that BTM ratio has insignificant relationship with stock returns in January.

Gaunt (2004) investigates multifactor model using size and BTM ratio for Australian equity market for the period of 1991 to 2000. Results reveal from this study suggests that size and BTM ratio is significantly related with stock returns. Results of this study are aligned with Fama and French (1993). In addition, this study provides the evidence that BTM ratio has more effect than size. Fan and Liu (2005) examine the relationship of size and BTM to explain the future expected returns of US equity market for the period of 1965 to 1998 by using second pass regression. The study reports that size and the BTM ratio contain distinct and significant components of financial distress, growth options, the momentum effect, liquidity, and firm characteristics.

Peterkort and Nielsen (2005) use BTM ratio as a proxy of risk for the equity market of US by developing similar model to Fama and French (1992) for the period of 1978 to 1995. This study finds inverse relationship between BTM ratio and portfolio returns of the firms with negative book value. Whereas no relationship has reported between BTM ratio with equity returns after controlling size. They suggest that BTM ratio increases due to market leverage and vice versa. Javid and Ahmad (2008) investigate that existence of CAPM with macroeconomic variables in Pakistani equity market for the period of 1993 to 2004. This study suggests that CAPM has no adequate explanatory power for equity returns. Mirza and Shahid (2008) has tested Fama and French model by using size and BTM ratio for 81 companies listed at Pakistani equity market. This study suggests that size and value premium is priced and confirm the presence of Fama and French model validity for Pakistani equity market.

Hassan and Javed (2011) also examine the multifactor model of Fama and French (1992) for the period of 2000 to 2007 by using size and value premium for Pakistani equity market. Both size and BTM ratio are found positively related to equity market returns. This study provides evidence that BTM ratio effect is less for lowest BTM ratio portfolios and higher for high BTM ratio portfolios. Results also provide insight about size factor loading is less for largest size portfolio and high for smallest portfolios returns. This study confirms that CAPM has low predictive power than multifactor model. The above mentioned discussion indicated that asset pricing mechanism exists in Pakistani equity market. Only few studies investigated the CAPM and Fama and French three factor model. No study is available based on the information efficiency factor R square as an explanatory variable. This study is an effort to introduce an additional factor in literature of asset pricing.

2.3.1 Research Hypothesis for market premium, information premium and value premium

High quality disclosure has more precision of information in stock prices and decease cost of equity (Francis et al., 2005). Lambert et al. (2012) also suggest that prevision of public and private information is an increasing function and it is negatively associated with the cost of equity. Roll (1988) argues that more firm specific information tends to have low R square or SPS. Farooq and Ahmed (2014) argue that SPS is an increasing function of governance environment of a firm and better governance mechanism reveal higher SPS and poor disclosure increases the information asymmetries for the investors. Mitton (2002) report that investors react more severely to the negative shocks in those firms having higher information asymmetries than firms have better governance mechanisms.

Results of Fama and French (1993) reveal that expected return on a market portfolio is in excess to risk free rate due to sensitivity of market portfolio. Fama and French (1995) suggest that high BTM ratio stocks are persistently distressed and low BTM ratio stocks have a stable profitability. So, high BTM ratio stocks have attributed to high risk and high future expected returns. Roll (1988) reports that stock price variations are not fully captured by market level or industry level information and the residual movements in stock price variations are captured by firm specific variables. Roll further suggests that when there is more firm specific information, there is higher Idiosyncratic volatility and the low R square.

Bae et al. (2006) suggest that firms with poor governance environment hide bad information or release bad information slowly. As a result of such behavior, returns of these firms are positively skewed. Whereas, Douch et al. (2015) argue that investors are able to see such behaviors and will penalize such firms. So, there is more probability of negative tails in these firms with low governance environment. Results of this study report that low SPS is associated with poor governance and have higher probability of dominant negative tails.

Greater SPS interprets that the value of R square is higher, which reflects less firm specific return variation and more market information and lower stock price synchronicity interprets that the value of R square is lower, which reflects more firm specific return variation and less market wide information (Morck et al., 2000). Kelly (2014) reports that high SPS firms attract institutional investors and institutional investors are holding long term positions for stocks, they do not overreact to negative news. Therefore, the returns of those firms will be higher with high SPS than low SPS firms.

H26: There is a positive association between market premium and stock returns

H27: There is a positive association between value premium and stock returns

H28: There is a positive association between information efficiency premium and high SPS portfolio returns

H29: There is a negative association between information efficiency premium and low SPS portfolio returns

CHAPTER 3

3. DATA DESCRIPTION AND METHODOLOGY

This section is divided into four parts:

3.1 Model specification for Weak form of efficiency

3.2 Model specification for stock price synchronicity

3.3 Model specification for foreign investment

3.2 Model specification for information premium

This study investigates and contributes to literature in four ways. Firstly, whether Pakistani stock market is weak form efficient or not?. Secondly, whether firm specific variables i.e. liquidity, illiquidity, cost of information, trading cost and investor attention can affect SPS. If market is efficient and information incorporation is rapid, it should increase foreign investment. So, it should be investigated that with firm specific variables leads towards information incorporation and attract foreign investment. Thirdly, this study built the relationship between firm specific variables and foreign ownership, to check whether information determinants are able to attract foreign investment or not. Fourthly, whether information efficiency premium is priced by using asset pricing mechanism on stylized portfolios?

3.1 Model specification Weak form of efficiency

To test weak form of efficiency this study employs number of econometric tests that are previously used by different studies starting from descriptive statistics to MVR test. Following are the different econometric tools to test weak form of efficiency.

3.1.1 Econometric Model for weak form of efficiency

3.1.1.1 Normality tests

Normality tests examine the distribution properties of data. These tests compare the data set with normal distribution. Fischer and Jordan (1991) suggest that the distribution of random occurrence should follow the normal distribution pattern. Therefore, if the changes in returns follow normal distribution pattern then these are random. To test normality of the data following test are used.

3.1.1.1.1 Jarque-Bera test

Most tests of normality are based on comparing the empirical and theoretical normal cumulative distribution or empirical and theoretical quantiles. Whereas, Jarque-Bera (1982, 1987) test check the normal distribution of skewness and kurtosis and it is a test of goodness of the fit. This test is defined as,

$$JB = \frac{n}{6}\left(S^2 + \frac{1}{4}(K-3)^2\right) \qquad (3.1)$$

Where,

n= Number of observations

S= Skewness

K= Kurtosis

3.1.1.1.2 Kolmogorov-Smirnov test

Kolmogorov (1933) forms the statistic and asymptotic distribution under the null hypothesis of Kolmogorov-Smirnov (KS) test and Smirnov (1948) gives the table of distribution for this test. KS test is used to compare the empirical and theoretical normal cumulative distribution, which can be normal, uniform, Poisson, or exponential. This test is defined as,

$$F_n(x) = \frac{1}{n}\sum_{i=1}^{n} I_{X_i \leq x} \quad (3.2)$$

Where,

Fn = Distribution function

n = Independent and identically distributed random observations

$I_{X_i \leq x}$ =Indicator function, equal to 1 otherwise 0

The KS statistic for a given cumulative distribution function F(x) is

$$D_n = sup_x |F_n(x) - \mathrm{F}(x)| \quad (3.3)$$

Where,

D_x = cumulative distribution function

sup_x = supremum of the set of distances

By the Glivenko–Cantelli theorem, if the sample comes from distribution F(x), then D_n converges to 0 almost surely.

3.1.1.2 Autocorrelation test

Autocorrelation test is widely used to test the relationship of the series return with its lag value. If there exists, a positive and significant autocorrelation in series then it indicates that trend exist. If there is a negative and significant autocorrelation in series, then it shows a reversal in price movement. A return series is called random if there is no autocorrelation exists. Two approaches are used in this study to test autocorrelation.

3.1.1.2.1 Parametric autocorrelation coefficient

The autocorrelation coefficient test is used to test the relationship between current and previous period returns. If there is zero autocorrelation coefficient then it assumes, that this return series follow random walk. This test is defined as,

$$R_{i,t} = \alpha_i + p_j R_{i,t-k} + \varepsilon_{i,t} \quad (3.4)$$

Where,

$R_{i,t}$ = return of stock "i" at time t

α_i = constant

$\epsilon_{i,t}$ = random error

k = various time lags

To test autocorrelation two tests are used as detailed below.

3.1.1.2.2 Autocorrelation function and Q-Ljung Box test

The serial autocorrelation test is used to test the relationship between current and its different lag returns. Ljung-Box (1978) test is also used to test the overall randomness on the basis of number of lags, rather testing randomness at each different lag.

$$Q_{Ljung-Box} = n\,(n+2)\sum_{t-1}^{k}\frac{\Psi^2(t)}{n-1} \tag{3.5}$$

Where,

n = number of usable data points after any differencing operations.

Ψ = accumulated sample autocorrelations up to any specified time lag *t*

3.1.1.3 Non Parametric Run test

Runs tests are "***a succession of identical symbols which are followed or preceded by different symbols or no symbol at all***" (Siegel, 1956). Run test measures the serial independence in return series whether succeeding price changes have certain trend or these series are autonomous to each other. It does not require the series returns are normally distributed. While applying correlation coefficient test to check the interdependence of the return series, extreme values may dominate. To overcome this issue, run test has been employed by different researchers. In order to apply run test, number of runs are be computed. The null hypothesis is tested in a series of consecutive return. There are the two approaches in consideration and both are based on return, one considers positive return (+) which means the return is greater than zero (return>0) and the other approach is negative return (-) which means the returns are less than zero (return<0). But, the second approach has the advantage of authorizing for and to correct the impact and consequence of an ultimate time movement in the return series. The run test is based on the argument that there is a random trend in the price changes (returns changes) than the numbers of expected runs necessarily close to the numbers of actual runs (Runs). It is also noted that test statistic is regarding normally distributed for bigger sample size. The formula for runs tests has been given by Wallis and Roberts (1956) as.

$$Z = \frac{(U - U_{\mu})}{\sigma_{ti}} \quad (3.6)$$

Where,

$$U_{\mu} = \frac{2m + m_{-}}{m} + 1 \text{ and } \sigma_{ti} = \sqrt{\frac{2m + m_{-} - (2m + m_{-} - m)}{m^2(m-1)}} \quad (3.7)$$

The "positive returns" (+) are reflected by +m and the entirety of "negative returns" (-) are reflected by –m concerning to a sample by means of observations "m", where m= (+m) + (-m).

3.1.1.4 Unit root tests

A necessary condition for random walk is to test whether financial time series is stationary or non-stationary. Unit root test is used to test sationarity of time series. Means and variance must be constant over time, if a data is stationary (Gujarati, 2008). To test unit root for a time series this study has used two tests i.e. (i) ADF test and (ii) Phillips- Perron test.

3.1.1.4.1 Augmented Dickey-fuller test

Dickey and fuller (1979) test assumes that variance of the time series is constant and error term is independent. This test assumes that error term is independent and its variance is constant. The ADF test is employed in order to check out that whether there is presence of unit root in the autoregressive model or not. A simple autoregressive model, AR (1) is,

$$y_t = \rho y_{t-1} + u_t \quad (3.8)$$

Where,

y_t = variable of interest for time period index t

ρ = coefficient

u_t = error term

The autoregression model can be written as:

$$\Delta Y_t = \alpha_0 + \alpha_1 T + (\rho - 1) Y_{t-1} + \sum \varphi_{i} {}_{\Delta X^{n}_{i=1}}{}_{t-1} + \varepsilon_t \quad (3.9)$$

Where,

Y = Natural logarithm

T = Linear time trend term

Ƿ, φ = Parameters

Δ = Operator for first-difference

ε_t = error term.

3.1.1.4.2 Phillips Perron test

Phillips and Perron (1988) have provided a substitute (non-parametric) technique for serial correlation for unit root. This test assumes that error term is not independent and is heterogeneously distributed. The PP test is instituted on the subsequent regression with same critical values used for ADF:

$$\Delta Y_t = \lambda_0 + \lambda_1 Y_{t-1} + \lambda_2 T + \sum_{i=1}^{n} \psi_i \Delta Y_{t-i} + \epsilon_t \tag{3.10}$$

Where,

Y_t = Given time series

T = Time

λ and ψ = Parameters

Δ = Operator for first-difference

ε_t = Error term

3.1.1.5 Multiple Variance ratio test

Chow and Denning (1993) propose MVR test, to examine the heteroscedasticity and autocorrelation in the financial series of returns. This test is used to investigate random walk under the assumption of varying distribution. The variance ratio model is symbolized by;

$$\text{VR (q)} = \frac{\sigma^2\ (q)}{\sigma^2\ (1)} \tag{3.11}$$

Where,

σ^2(q)= 1/qth variance of the q-differences

σ^2(1) = First differences variance

For null hypothesis VR (q) =1

Lo and MacKinlay (1988) propose two tests, first Z(q) and the other is Z*(q) under the null hypothesis of "Homoscedastic increase random walk" and "Heteroscedastic increase random walk". Under the assumption of "Homoscedastic increase random walk" the Z(q) test is as under,

$$Z(q) = \frac{\{VR(q)-1\}}{\sigma_0\,(q)} \quad (3.12)$$

Where,

$$\sigma_o(q) = \left[\frac{\{2(2q-1)(q-1)\}}{3q\,(nq)}\right]^{1/2} \quad (3.13)$$

Z^* (q) test statistic for "Heteroscedastic increase random walk" is;

$$\frac{Z*(q)=\{VR(q)-1\}}{\sigma\sigma\,(q)} \quad (3.14)$$

Where,

$$\sigma_o(q) = \left[4\,\sum_{k=1}^{q=1}\left(1-\frac{k}{q}\right)^2 \delta_k\right]^{1/2} \quad (3.15)$$

and

$$\delta_k = \frac{\sum_{i=k+1}^{mq}(p_k - p_{k-1} - q\hat{u})^2(p_{i-k} - p_{i-k-1} - q\hat{u})^2}{[\sum_{i=1}^{mq}(p_k - p_{k-1} - q\hat{u})^2]} \quad (3.16)$$

MVR test of Chow and Denning's (1993) compares multiple comparisons of different set of variance ratio estimates by generating a procedure for various assessments with unity. Sole variance ratio test, in the null hypothesis is, *VR (q)* = 1, therefore

Mr (q) = VR (q) – 1 = 0. Under the null hypothesis i.e. random walk suppose a set of m variance ratio tests {Mr (q) I = 1, 2….m}, there are multiple hypothesis;

H_oi: Mr (qi) = 0 for i = 1, 2….m

H_oi: Mr (qi) = 0 for i ≠ 1, 2….m

Random walk null hypothesis is rejected if any one H_0i is rejected. For different set of tests including Z (q), {Z (qi) I = 1, 2… m} test statistic, if any one of the predictable variance ratio is considerably dissimilar from one then there is rejection of null hypothesis i.e. random walk. Therefore, in the set of test statistics only the highest worth is believed. The spirit of the multiple variance ratios (MVR) projected by Chow and Denning's (1993) is stood on the result:

PR {max (1Z (q_1)1……. (1Z (q_m) 1) ≤ SMM (α; m; T)) ≥ 1-α} (3.17)

Chow and Denning (1993) organize the size of "MVR" through the comparison of the "SMM" critical value with the calculated values of the standardized test statistic either Z (q) or Z^* (q). Prominently, under the homoscedasticity the refusal of the random walk is due to either the presence of autocorrelation in the series of stock prices and/or due to heteroscedastic. Therefore, it is the confirmation of autocorrelation in the series of stock returns if there is refusal of "heteroscedastic random walk".

Weak form efficiency has been tested by using daily, weekly and monthly closing prices of KSE-100 index for the period of 2002 to 2012. Continuous compounding daily, weekly and monthly returns are collected by using:

$$\text{Return} = \text{Ln}\left[\frac{P_t}{P_{t-1}}\right] \tag{3.18}$$

Where,

P_t and P_{t-1} are closing prices on Day, Week or Month t and t-1 respectively.

Stock index data is collected from Karachi stock exchange, which is reliable source of information.

3.2 Model specification for Stock price synchronicity

To estimate the effect of information environment variables on SPS in this study pooled regression is used.

3.2.1 Econometric Model for Stock price synchronicity

In this study panel data is used to explore the impact of information variables on SPS. Panel data analysis is used for the data having different cross sections over time. Simple panel data cross section estimation assumes that all firms are homogenous and coefficient is common across all companies. The following model is used to estimate common cross section regression:

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Liquidity)_{it} + \beta_7 ln(Illiquidity)_{it} + \beta_8 ln(Returns)_{it} + \delta_{it} \qquad (3.19)$$

Where,

SYNCH	=Stock price synchronicity
Inst	= percentage of Institutional ownership
Age	= Number of listed at stock market
TC	= Trading cost
Size	= Firm size
BTM	= Book to market ratio
Liquidity	= Liquidity of stock
Illiquidity	= Illiquidity of stock
Returns	= Yearly average stock returns
δ	= Error term

Different proxies of liquidity, illiquidity and stock returns are used to test the robustness of the model. For liquidity three measures of liquidity are used traded volume, total traded value and turnover rate. For illiquidity two measures of illiquidity are used Amihud illiquidity measure (2002) and percentage of zero traded days. For returns, four measures are used yearly average of daily returns, yearly average of weekly returns, yearly average of monthly returns and yearly average of absolute returns.

Panel data assumes common parameters of the variables included in the model. Whereas, data may vary in terms of cross section and intercept may differ and provide biased results. So, to address this problem fixed estimation is used due to different intercepts cross sections. In this study both industry and high to low R square based companies' dummies are introduced and fixed estimation pooled dummy analysis is performed. There are the following equations:

$$\boldsymbol{SYNCH_{i,t}} = \boldsymbol{\alpha_{it}} + \boldsymbol{\beta_1}\, \boldsymbol{ln(Inst)_{it}} + \boldsymbol{\beta_2 ln(Age)_{it}} + \boldsymbol{\beta_3}\, \boldsymbol{ln\,(TC)_{it}} + \boldsymbol{\beta_4 ln(Size)_{it}} + \boldsymbol{\beta_5 ln(BTM)_{it}} + \boldsymbol{\beta_6 ln(Liquidity)_{it}} + \boldsymbol{\beta_7 ln(Illiquidity)_{it}} + \boldsymbol{\beta_8 ln(Returns)_{it}} + \sum \boldsymbol{IndD_{it}} + \boldsymbol{\delta_{it}} \quad (3.20)$$

Where, all variables are the same as discussed in equation 3.19 and IndD is industry dummy.

$$\boldsymbol{SYNCH_{i,t}} = \boldsymbol{\alpha_{it}} + \boldsymbol{\beta_1}\, \boldsymbol{ln(Inst)_{it}} + \boldsymbol{\beta_2 ln(Age)_{it}} + \boldsymbol{\beta_3}\, \boldsymbol{ln\,(TC)_{it}} + \boldsymbol{\beta_4 ln(Size)_{it}} + \boldsymbol{\beta_5 ln(BTM)_{it}} + \boldsymbol{\beta_6 ln(Liquidity)_{it}} + \boldsymbol{\beta_7 ln(Illiquidity)_{it}} + \boldsymbol{\beta_8 ln(Returns)_{it}} + \sum \boldsymbol{R^2PD_{it}} + \boldsymbol{\delta_{it}} \quad (3.21)$$

Where, all variables are the same as discussed in equation 3.19 and R^2PD is dummy of average R square decile portfolio. Then all companies are sorted on the basis of R square and divided into five R square based portfolios and estimated by using the same models presented in equation 3.19. To check the robustness of different proxies of liquidity, illiquidity and returns for SPS different models has used and are given in Appendix A.

3.2.2 Dependent Variables

3.2.2.1 Stock price Synchronicity

Market model R square is used as a proxy of SPS which is calculated by using basic asset pricing model. The study uses weekly market return and weekly individual firm stock return proposed by various studies (Morck et al., 2000; Dasgupta et al., 2010; Li et al., 2014 and Zhang et al., 2016). The following model is used.

$$R_{i,t} = \alpha_i + \beta_{Mkt,i,t} R_{Mkt \neq i,t} + e_{i,t} \quad (3.22)$$

$R_{i,t}$ is return of individual firm stock return, $R_{Mkt \neq i,t}$ is value weighed market returns. For each firm R square measure of Durnev, Morck, and Yeung (2004) is applied by log transformation of R-square:

$$SYNCH_{i,t} = \ln\left(\frac{R^2}{1-R^2}\right) \quad (3.23)$$

This log transformation is equal to the ratio of explained versus unexplained variance.

3.2.3 Independent Variables

3.2.3.1 Liquidity:

Liquidity of financial market measures the smooth trading of stocks. Liquidity of stock market is measured by using three measures. In this study turnover rate, trading volume and traded volume are used as a proxy of trading activity.

First measure is turnover rate, which is introduced by Datar, Naik and Radcliffe (1998) i.e., the number of shares traded in a given day divided by the number of shares outstanding that day or percentage of outstanding shares traded in a day. Then it will be averaged for the year to provide yearly measure. This is an intuitive measure, as it simply states how many times the outstanding equity switched hands during a period.

$$\text{Turnover rate} = \frac{\text{number of shares traded in a given day}}{\text{the number of shares outstanding}} \quad (3.24)$$

Second measure in this study is average number of share traded in a year, which is trading volume used by Baruch and Saar (2009).

$$\text{Trading volume} = \text{Average number of shares traded in a given day} \quad (3.25)$$

Third measure is average value of share traded in a day i.e., yearly average of number of shares traded in a given day multiply by market price per share on the day.

$$\text{Average value of share traded} = \text{Average number of shares traded in a given day X market price per share on the day} \quad (3.26)$$

Illiquidity of stock market is measured by using two illiquidity measures Amihud (2002) and Percentage of zero volume days. Amihud (2002) Illiquidity measure is based on price sensitivity to traded volume. It is calculated as the average of the absolute daily returns divided by average of the daily dollar volume of trade over the year.

$$\text{Amihud Illiquidity (2002)} = \frac{\text{average of the absolute daily returns}}{\text{average of the daily dollar volume of trade}} \quad (3.27)$$

The second measure of price impact is Percentage of zero volume days used by Dasgupta et al. (2010), which is percentage of zero volume days as the percentage of days with non-missing price data where the volume is reported as zero by the firm.

$$\text{Percentage of zero volume days} = \frac{\text{zero volume days}}{\text{total number of days trading}} \quad (3.28)$$

3.2.3.2 Attention and cost of information (Size and age):

As earlier discussed, cost of information is a major portion which traders allocate for collecting information. So, they optimally allocate recourses and get the important information only. Two proxies are used to capture attention: Size and age. Merton (1987) states that more investors follow large firms than small and young firms. Hence, Size is used to capture the attention of analyst coverage and calculated by multiplying the market price per share with the number of shares outstanding on June 30 every year, which is used by Banz (1981). Analyst coverage and firm size is strongly correlated as stated by Bhushan (1989).

$$\text{Size} = \text{market price per share x number of shares outstanding} \quad (3.29)$$

Age is measured as the number of years listed on the stock market.

$$\text{Age} = \text{number of years a firm listed on the stock market} \qquad (3.30)$$

3.2.3.3 Informed trader

Institutional ownership is used as a proxy of informed trader. Dahlquist and Robertsson (2001) and Huberman (2001) argue that investors prefer those firms, which are well known and with they are more familiar. Institutional ownership is calculated as the percentage of holding shares by institutional investors to shares outstanding.

$$\text{Institutional ownership} = \frac{Number\ of\ shares\ held\ by\ \text{institutional investor}}{\text{number of shares outstanding}} \qquad (3.31)$$

3.2.3.4 Book to market:

The valuation measure of Book to market ratio of a firm is used, which is proposed by Fama and French (1996). Book to market ratio of every sample security is computed at June 30, by dividing book value of equity with market value of equity. This is a valuation measure of the firm.

$$\text{Book to market ratio} = \frac{\text{Book value of equity}}{\text{Market value of equity}} \qquad (3.32)$$

3.2.3.5 Trading cost:

Trading costs are associated with the cost on buying or selling the security. It is the relative difference between the bid and ask prices of stocks. For transaction cost measure difference between highest price of the day a buyer is will to pay for the security and lowest price of the day a seller willing to accept for security (Wang, 2003).

$$\text{Trading cost} = \text{highest price of the day} - \text{lowest price of the day} \qquad (3.33)$$

3.3 Model specification for foreign investment

To estimate the effect of information environment variables on foreign ownership in this study pooled regression is used. Foreign ownership is used as a proxy of foreign investment as recommended by Dahlquist and Robertsson (2001), Lin and Shiu (2003) and Bushee et al., (2010). Foreign ownership is calculated as the percentage of holding shares by foreign investors to shares outstanding.

3.3.1 Econometric Model for Stock price synchronicity and foreign investment

After that to test information variables impact on foreign investment both cross section and pool dummy variable analysis the following equations are used:

$$\boldsymbol{FI_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Liquidity)_{it} + \beta_7 ln(Illiquidity)_{it} + \beta_8 ln(Returns)_{it} + \delta_{it}} \quad (3.34)$$

Where,

FI = Foreign investment
Inst = percentage of Institutional ownership
Age = Number of listed at stock market
TC = Trading cost
Size = Firm size
BTM = Book to market ratio
Liquidity = Liquidity of stock
Illiquidity = Illiquidity of stock
Returns = Yearly average stock returns
δ = error term

Foreign ownership is used as a proxy of foreign investment, which is used by Dahlquist and Robertsson (2001), Lin and Shiu (2003) and Bushee et al., (2010). Foreign investment is calculated as the percentage of holding shares by foreign investors to shares outstanding.

$$\text{Foreign investment} = \frac{Number\ of\ shares\ held\ by\ foreing\ \text{investor}}{\text{number of shares outstanding}} \quad (3.35)$$

All independent variables are the same as defined in section 3.2.3. In this study industry based dummies are introduced to check the difference in foreign investment across different industries and fixed estimation pooled dummy analysis is performed. There is the following equation:

$$\%FI_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Liquidity)_{it} + \beta_7 ln(Illiquidity)_{it} + \beta_8 ln(Returns)_{it} + \sum IndD_{it} + \delta_{it} \quad (3.36)$$

Where, all variables are the same as discussed in equation 3.34 and IndD is industry dummy. To check the robustness of different proxies of liquidity, illiquidity and returns for foreign investment different models has used and are given in Appendix A.

Information environment quality is captured by using firm specific variables for 152 Pakistani firms listed at KSE for the period of 2002 to 2012 is collected. The variables include, Age, size, institutional ownership, book to market ratio, trading cost, volume, turnover rate, value traded, Amihud illiquidity, percentage of zero volume days, daily returns, weekly returns, monthly returns and absolute daily returns.

First of all, firm level data is employed to observe the impact of Information environment quality variables on SPS. In second step, the data is observed the difference of SPS in each of the industry, for industry specific analysis 152 companies are grouped in 14 industries and are given in appendix B. In third step, study explains the difference of SPS in each R square sorted portfolio. To create R square sorted portfolios market model R square is calculated by using weekly data and firms are arranged in ascending order on the basis of R square and all firms are grouped in 10 R square portfolios. In fourth step, in each year firms are divided in to five R square portfolios and firm level data is employed for individual firms in each of the portfolio. Then the impact of Information environment firm specific variables on SPS is observed in each of the portfolio 1 to 5.

To observe the impact of Information environment quality variables on foreign investment, firm level data is employed for 152 Pakistani firms listed at KSE for the period of 2002 to 2012. In next step for foreign investment analysis, the data is observed the difference of foreign investment in each of the industry.

3.4 Model specification for information premium

This study employs a three factor model to capture the role of market premium, BTM ratio and information efficiency premium in determining the equity returns. This methodology is in line with famous three factor model proposed by Fama and French (1993).

3.4.1 Econometric model for information premium

The algebraic representation of models is as under.

The first equation is:

Rit - Rft = α+ β1 (Market premium) + error term (3.37)

$$R_{it} - R_{ft} = a_i + \beta_1 MKT_t + e_t \quad (3.38)$$

Where,

R_{it} =Return of portfolio "i" for period "t"

R_{ft} = Risk Free Rate.

MKT = $Rmkt_t - Rfr_t$

The second equation is:

$\mathbf{R_{it}} - \mathbf{R_{ft}} = \alpha + \beta_1$ (Market premium) + β_2 (Size premium) + β_3 (Value premium) + error term (3.39)

$$R_{it} - R_{ft} = a_i + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + e_t \quad (3.40)$$

Where,

R_{it} =Return of portfolio "i" for period "t"

R_{ft} = Risk Free Rate.

MKT = $Rmkt_t - Rfr_t$

SMB = $S_{\text{Return of small size stocks, t}} - B_{\text{Return of big size stocks, t}}$

HML = $H_{\text{Return of high BTM ratio stocks, t}} - L_{\text{Return of low BTM ratio stocks , t}}$

The third equation is:

$\mathbf{R_{it}} - \mathbf{R_{ft}} = \alpha + \beta_1$ (Market premium) + β_2 (Size premium) + β_3 (Value premium)

+ β_4 (information efficiency premium) + error term (3.41)

$$R_{it} - R_{ft} = a_i + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 IEP_t + e_t \quad (3.42)$$

Where,

R_i =Return of portfolio "i" for period "t"

R_{ft} = Risk Free Rate.

MKT = $Rmkt_t - R_{ft}$

SMB = $S_{\text{Return of small size stocks, t}}$ - $B_{\text{Return of big size stocks, t}}$

HML = $H_{\text{Return of high BTM ratio stocks, t}}$ - $L_{\text{Return of low BTM ratio stocks , t}}$

IEP = $HR_{\text{Return of high R square stocks, t}}$ - $LR_{\text{Return of low R square stocks, t}}$

The Fourth equation is:

$$Ri - R_fi = \beta_0 + \lambda_1 \text{ Beta of (Market premium)} + \lambda_2 \text{ Beta of (Size premium)} + \lambda_3 \text{ Beta of (Value premium)} + \text{error term} \quad (3.43)$$

$$R_i - R_{fi} = a_i + \lambda_1\beta_{1i}MKT_i + \lambda_2\beta_{2i}SMB_i + \lambda_3\beta_{3i}HML_i + e_t \quad (3.44)$$

Where,

R_i =Return of portfolio "i" for period "t"

R_{fi} = Risk Free Rate.

$\beta_{1i}MKT$ = beta of ($Rmkt_t - Rf_t$)

$\beta_{2i}SMB$ =beta of ($S_{\text{Return of small size stocks, t}}$ - $B_{\text{Return of big size stocks, t}}$)

β_{3i} HML =beta of ($H_{\text{Return of high BTM ratio stocks, t}}$ - $L_{\text{Return of low BTM ratio stocks , t}}$)

The Fifth equation is:

$$Ri - R_{ft} = \beta_0 + \lambda_1\text{Beta of (Market premium)} + \lambda_2\text{Beta of (Size premium)} + \lambda_3\text{Beta of (Value premium)} + \lambda_4\text{ Beta of (information efficiency premium)} + \text{error term} \quad (3.45)$$

$$R_i - R_{fi} = a_i + \lambda_1\beta_{1i}MKT_i + \lambda_2\beta_{2i}SMB_i + \lambda_3\beta_{3i}HML_i + \lambda_4\beta_{2i}IEP_i + e_t \quad (3.46)$$

Where,

R_{it} =Return of portfolio "i" for period "t"

R_{fi} = Risk Free Rate.

$\beta_{1i}MKT$ = beta of $Rmkt_t - Rf_t$

$\beta_{2i}SMB$ =beta of ($S_{\text{Return of small size stocks, t}}$ - $B_{\text{Return of big size stocks, t}}$)

β_{3i} HML =beta of ($H_{\text{Return of high BTM ratio stocks, t}}$ - $L_{\text{Return of low BTM ratio stocks , t}}$)

β_{4i} IEP = beta of ($HR_{\text{Return of high R square stocks, t}}$ - $LR_{\text{Return of low R square stocks, t}}$)

3.4.2 Portfolio Formation

The following criterion is used for portfolio construction.

1) In order to capture size effect, size sorted portfolios have been constructed. Market capitalization is calculated by multiplying market price per share with number of outstanding share for individual stock at the end of June for every year t-1 and then stocks are organized small to big. After finding the median that data is divided into two equal portfolios. First portfolio consists of stocks having low market capitalization called "Small". The other portfolio consists of large market capitalization called "Big".
2) In second step BTM ratio is calculated by dividing book price per share with market price per share at the end of June for every year t-1 and then the size sorted portfolios are further divided into two portfolios on the basis of BTM ratio. The first portfolio contains High BTM ratio stocks and the second portfolio contains Low BTM ratio stocks. When "Small" is further subdivided into two portfolios on the basis of BTM ratio, it forms two portfolios namely S/H and S/L. When "Big" is further subdivided into two portfolios on the basis of BTM ratio, it forms two portfolios B/H and B/L.
3) In third step R square is calculated by using market model for 52 weeks' stock returns at the end of June for every year t-1 and then the BTM ratio sorted portfolios are further divided into two portfolios on the basis of R square. The first portfolio contains High R square stocks and the second portfolio contains Low R square stocks. When "S/H" is further subdivided into two portfolios on the basis of R square, it forms two portfolios namely S/H/HR and S/H/LR. When "S/L" is further subdivided into two portfolios on the basis of R square, it forms two portfolios namely S/L/HR and S/L/LR. When "B/H" is further subdivided into two portfolios on the basis of R square, it forms two portfolios namely B/H/HR and B/H/LR. When "B/L" is further subdivided into two portfolios on the basis of R square, it forms two portfolios namely B/L/HR and B/L/LR.

3.4.3 Variable Construction for information premium

To separate the factor premiums from each other, the three factors are construed as follows:

$$SMB = \frac{1}{4} * (S/H/HR - B/H/HR) + (S/H/LR - B/H/LR) + (S/L/HR - B/L/HR) + (S/H/LR - B/H/LR) \quad (3.25)$$

$$HML = \frac{1}{4} * (S/H/HR - S/L/HR) + (S/H/LR - S/L/LR) + (B/H/HR - B/L/HR) + (B/H/LR - B/L/LR) \quad (3.25)$$

$$IEP = \frac{1}{4} * (S/H/HR - S/H/LR) + (S/L/LR - S/L/HR) + (B/H/LR - B/H/HR) + (B/L/LR - B/L/HR) \quad (3.26)$$

$$MKT = (Rmkt_t - Rf_t) \quad (3.27)$$

Where,

$Rmkt_t = Ln\ (MP_t / MP_{t-1})$

MKT is market premium. $Rmkt_t$ is market return for the month “t” and “MP_t” and “MP_{t-1}” are the month end values of KSE 100 index for the months of “t” and “t-1”. Rf_t is 6 months t bill rate used as a proxy of risk free rate.

In this study for testing multifactor asset pricing model weekly and monthly closing prices for 152 stocks listed at KSE for the period of 2002 to 2012 are employed with the following criteria:

1) The sample consists of 152 stocks from non-financial sector
2) Stocks included companies that are the part of KSE-100 index over the sample period
3) Six-month treasury bill rates are used as a proxy of risk free rate
4) Market value index of KSE-100 index is used for market return
5) For calculating BTM ratio data for book value has been collected from the financial statements of the companies and for market value is taken from different websites
6) R square is calculated from 52 weeks’ stock returns at the end of June for every year t-1 by using market model

Accounting data collected from Balance Sheet Analysis published by State Bank of Pakistan, stock prices data obtained from business recorder.

CHAPTER 4

4. RESULTS AND DISCUSSION

This section reports:

4.1 Results of Weak form of efficiency

4.2 Results of Stock price synchronicity and information environment variables

4.3 Results of foreign investment and information environment variables

4.4 Results of market premium, information premium and value premium

4.1 Results of weak form of efficiency:

Section 4.1 reports weak form efficiency results for daily, weekly and monthly return series for the period of 2002 to 2012.

4.1.1 Descriptive statistics of daily, weekly and monthly returns

The statistical behavior of financial time series of daily returns, weekly returns and monthly returns for the period of 2002 to 2012 is presented in Table 4.1.

Table 4.1: Descriptive statistics for the period of 2002-2012

Statistic	***Monthly Returns***	***Weekly Returns***	***Daily Returns***
Mean	0.017	0.004	0.001
Median	0.020	0.008	0.001
Standard Deviation	0.083	0.035	0.014
Kurtosis	10.606	8.228	5.307
Skewness	-1.713	-1.408	-0.387
Minimum	-0.449	-0.201	-0.060
Maximum	0.202	0.109	0.088

Table 4.1 reports the descriptive statistics for the KSE returns. Descriptive statistics shows that the average daily returns are 0.10 % and the Average standards deviation is 1.40 %. While the average weekly returns are 0.40 % and the standards deviation is 3.50 %. Likewise, the average monthly returns are 1.7 % and the standard deviation for the monthly returns is 8.3 %. Descriptive statistics result also shows that all the three types of returns (monthly, daily and weekly) are skewed negatively for the period June 2002 to June 2012 which clearly specifies that large negative returns (minimum extreme values) are dominant than higher positive returns (maximum extreme values). If kurtosis is >3 then pattern is leptokurtic and that are associated with simultaneously “peaked” and fat tail. But when kurtosis is less than 3 it is called platykurtic and that are associated with simultaneously “less peaked” and have “thinner tail”. The values of the kurtosis in the descriptive statistics for monthly, weekly and daily returns are greater than 3 which mean that the distributions of the returns are leptokurtic indicating higher peaks than expected from normal distribution.

4.1.2Normality Tests

4.1.2.1 Jarque-Bera test

The results of Jarque-Bera tests are reported in the table 4.2 given below.

Table 4.2: Jarque-Bera test

	Monthly Returns	***Weekly Returns***	***Daily Returns***
JB (Observed Value)	345.014*	758. 037*	610.475*
JB (Critical Value)	5.991	5.991	5.991
p-value	0.0000	0.0000	0.0000

Note: * *Indicates that null hypothesis of normality assumption is rejected at 1% significance level*

The observed value in the daily data is greater than the critical value in above table. Similarly, in case of both weekly and monthly data the observed values of Jarque-Bera are also greater than that of critical values. The results of all returns series (daily, monthly and weekly) rejected the normality assumption.

4.2.1.2 Kolmogorov-Smirnov (KS) test

In order to identify the difference of the underlying probability distribution from a hypothesized distribution the Kolmogorov-Smirnov (KS) test is used. The distribution function F_n for the n observations y_t is: F_n (x) = 1/n ∑1 if y i≤x, for all i= 1, 2, 3 ….n and F_n (x) = 0 otherwise

Table 4.3: One-Sample Kolmogorov-Smirnov Test

		Daily Returns	***Weekly Returns***	***Monthly Returns***
N		2474	516	119
Normal Parameters[a,b]	Mean	.0008	.0039	.01718
	Std.	.0144	.0350	.0826
Most Extreme Differences	Absolute	.095	.125	.120
	Positive	.061	.077	.077
	Negative	-.095	-.125	-.120
Kolmogorov-Smirnov Z		4.737	2.837	1.312
Asymp. Sig. (2-tailed)		.000*	.000*	.064

Note: [a] *Test distribution is Normal.*
* *indicates 1% significance level*

Results of the KS test are presented in the table 4.3. Results show that the p-value for the monthly returns series (p-value = 0.064) is higher than critical value, which leads to the assumption that monthly data is not normally distributed, but at 90% level of confidence it is normally distributed. In case of weekly and daily returns the p-value = 0.000 that directs to the rejection of the normality of data.

4.1.3 Autocorrelation function test and Q test:

The autocorrelation coefficient function is calculated up to 10 lags, and results are reported in Table 4.4. The findings indicate that the lag returns can predict current returns and random walk is not observed so market is inefficient.

Table 4.4: Autocorrelation and Q-statics returns

Lags	1	2	3	4	5	6	7	8	9	10
Daily Returns										
AC	0.12	0.03	0.06	0.04	0.01	0.01	0.03	0.00	0.05	0.05
Q-Stat	38.02	39.85	48.45	52.38	52.84	53.18	55.62	55.65	61.81	68.97
Prob	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
Weekly Returns										
AC	0.16	0.07	0.14	0.08	-0.06	-0.06	-0.01	-0.02	0.00	0.01
Q-Stat	12.88	15.47	25.74	29.07	31.01	33.00	33.03	33.25	33.25	33.28
Prob	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
Monthly Returns										
AC	0.17	-0.07	-0.04	0.09	0.11	0.05	0.04	-0.02	0.04	-0.06
Q-Stat	3.54	4.20	4.44	5.42	6.97	7.27	7.42	7.50	7.72	8.24
Prob	0.06	0.12	0.22	0.25	0.22	0.30	0.39	0.48	0.56	0.61

*Note: *indicates 1% significance level*

The results of Table 4.4 indicate that there exists auto correlation and in daily and weekly returns. So, it can be concluded that daily and weekly returns of KSE does not follow random walk. But for monthly returns no autocorrelation exists for any lag.

4.1.3.1 Non-Parametric Run test

Run test measures the serial independence in return series whether succeeding price changes have certain trend or these series are autonomous to each other.

Table 4.5: Runs Test for daily weekly and monthly returns

	Monthly Returns	Weekly Returns	Daily Returns
Test Value[a]	.0172	.004	.001
Cases < Test Value	57	216	1189
Cases >= Test Value	62	300	1285
Total Cases	119	516	2474
Number of Runs	50	210	1152
Z	-1.917	-3.817	-3.389
Asymp. Sig. (2-tailed)	.055	.000**	.001**

Note: [a]. Mean
Z- Statistics is ≥1.96 then we cannot be accepted null hypothesis at 5% significance level
*** indicates 5% significance level*

Table 4.5 shows the result of run test. It displays that the monthly returns are insignificant as p-value is greater than critical value (.055>0.05). This insignificance in monthly returns does not reject the hypothesis of randomness implying that "there is no autocorrelation in monthly returns". Run test also displays that in monthly returns the experimental numbers of runs drop within the studied interval. So, random walk (randomness of series) hypothesis cannot be discarded, entailing that autocorrelation does not exist in monthly returns.

The p-value for the daily and weekly returns is less than 0.05 which rejects the hypothesis of randomness implying that there is an autocorrelation in daily and weekly returns. Similarly, in case of daily or weekly returns the experimental numbers of runs do not drop within the studied interval at, so the null hypothesis of randomness can be discarded, entailing that few species of autocorrelation exists in the daily returns and weekly returns.

4.1.4 Unit Root Test

In order to understand whether the index of KSE is stationary or not, the ADF and PP tests are used at level and 1st difference.

4.1.4.1 Augmented Dickey Fuller test

The postulation is made by the distribution theory sustaining the ADF (Augmented Dickey Fuller) test that data is independently and individually distributed.

Table 4.6: Augmented Dickey Fuller test at level on KSE-100 Index

ADF test statistic	*Monthly Returns*	*Weekly Returns*	*Daily Returns*
Level	-0.818	-0.915	-0.808
1st difference	-9.973*	-21.291*	-46.080*
Critical value at 5%	-2.884	-2.866	-2.862
Critical value at 1%	-2.579	-2.569	-2.567

*Note: *indicates 1% significance level*

All the reported values in Table 4.6 show that ADF test statistic results at level are less than critical or tabulated values. But all the reported values show that data is stationary at first difference. Hence, data is non-stationary at level.

4.1.4.2 Phillips Perron Test

The postulation is made by the distribution theory sustaining the ADF (Augmented Dickey Fuller) test that data is independently and individually distributed. But the data used here may not fulfill this condition. Therefore, Phillips Perron test which is an alternative test is used that permit the error conflicts to be weakly reliant and heterogeneously distributed.

Table 4.7: Phillips Perron test at level on KSE-100 Index

PP test statistic	*Monthly Returns*	*Weekly Returns*	*Daily Returns*
Level	-0.923	-0.976	-0.862
1st difference	-9.945*	-21.398*	-46.309*
Critical value at 5%	-2.884	-2.866	-2.862
Critical value at 1%	-2.579	-2.569	-2.567

Note: *indicates 1% significance level

All the reported values in Table 4.7 show that PP test statistic results at level are less than critical or tabulated values. But all the reported values show that data is stationary at first difference. Hence, data is non-stationary at level.

4.1.5 Multiple Variance Ratio Tests

For the further testing of mean reversion versus random walk in KSE index the MVR test is employed. Here the MVR test is used with the assumption of heteroscedastic as well as with the assumption of homoscedasticity.

4.1.5.1 Results of multiple variance ratio tests (heteroscedasticity)

First the null and the alternative hypothesis for MVR tests under the assumptions of heteroscedasticity are following;

H_0: VR (q_i) = 1

H_1: VR (q_i) ≠ 1

Table 4.8: Results of multiple variance ratio tests (Heteroscedasticity)

	q	2	4	8	12	24	30	60
Daily Returns	**VR (q)**	0.556	0.275	0.144	0.093	0.051	0.038	0.020
	Z*(q)	-13.910*	-12.702*	-10.035*	-8.639*	-6.449*	-5.891*	-4.403*
Weekly Returns	**VR (q)**	0.554	0.276	0.155	0.103	0.053	0.040	0.023
	Z*(q)	-5.559*	-5.205*	-4.099*	-3.600*	-2.903*	-2.708*	-2.083*
Monthly Returns	**VR (q)**	0.658	0.287	0.168	0.107	0.067	0.061	0.047
	Z*(q)	-2.245*	-2.834*	-2.407*	-2.145*	-1.693	-1.556	-1.191

* *indicates 5% significance level*

In the above table 4.8 the standardized VR (Variance ratio) test statistics for Z^* (q) is calculated for all three types of returns i.e. monthly, weekly and daily returns under the assumption of hetereoscedasticity. It is clearly shown in daily and weekly returns the standardized VR (Variance ratio) test statistics for Z^* (q) is significant for all periods. This significance of the variance ratio showed that the null hypothesis of the random walk i.e. daily and weekly stock returns follow random walk is rejected under heteroscedasticity. In case of monthly stock returns it is shown that for monthly returns the standardized VR (Variance ratio) test statistics for Z^* (q) is significant for q=2, q=4, q=8, q=12 periods. This significance of the variance ration showed that the null hypothesis of the random walk i.e. monthly stock returns follow random walk is rejected for all periods (q) under heteroscedasticity.

Fig-4.1: Daily returns

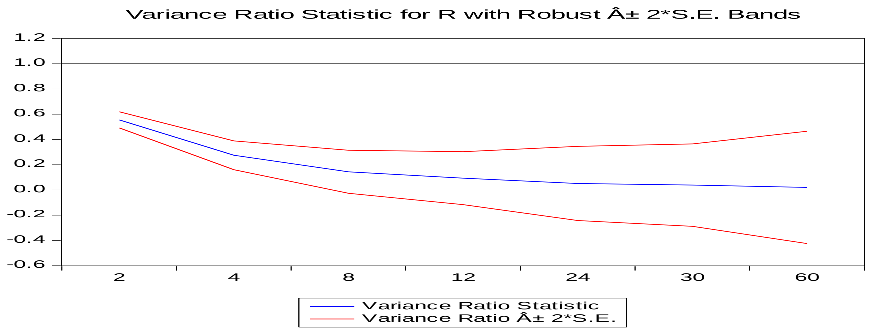


Fig-4.2: Weekly returns

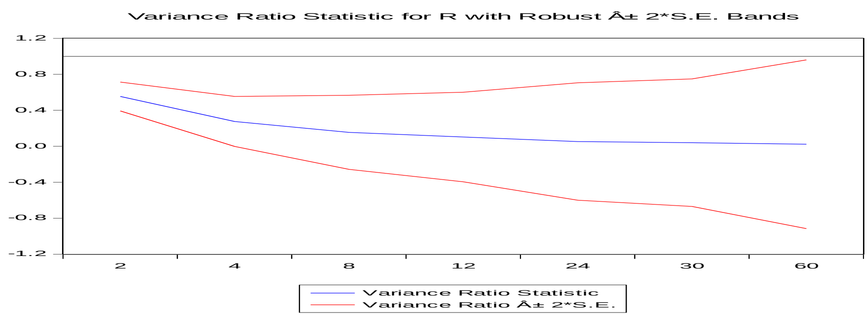
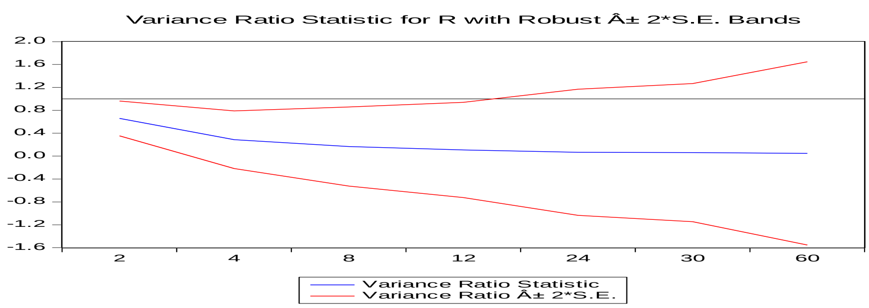


Fig-4.3: Monthly returns



The above given graphs show the variance ratio statistics for daily, weekly and monthly returns under the assumption of heteroscedasticity and plus or minus two asymptotic standard error bands, along with a horizontal reference line at 1 representing the null hypothesis. Here the null reference line lies inside the bands which reject the random walk hypothesis with heteroscedasticity that is a null hypothesis.

4.1.5.2 Results of multiple variance ratio tests (Homoscedasticity)

For the further testing of mean reversion versus random walk in KSE-100 prices index, the strong MVR test is employed with the assumption of homoscesdicity. Null and alternative hypothesis are constructed in that assumptions. The null and the alternative hypothesis for MVR tests under the assumptions of homoscesdicity are following.

Table 4.9: Results of multiple variance ratio tests (Homoscedasticity)

	q	2	4	8	12	24	30	60
Daily	**VR (q)**	0.556	0.275	0.144	0.093	0.051	0.038	0.020
Returns	**Z(q)**	-22.099*	-19.282*	-14.392*	-12.029*	-8.609*	-7.755*	-5.518*
Weekly	**VR (q)**	0.554	0.276	0.155	0.103	0.053	0.040	0.023
Returns	**Z(q)**	-10.127*	-8.782*	-6.483*	-5.432*	-3.923*	-3.535*	-2.511*
Monthly	**VR (q)**	0.658	0.287	0.168	0.107	0.067	0.061	0.047
Returns	**Z(q)**	-3.710*	-4.143*	-3.057*	-2.586*	-1.850	-1.654	-1.172

** indicates 5% significance level*

In the above table 4.9 the standardized VR (Variance ratio) test statistics for Z^* (q) is calculated for all three types of returns i.e. monthly, weekly and daily returns under the assumption of homoscesdicity. It is clearly shown in daily and weekly returns the standardized VR (Variance ratio) test statistics for Z^* (q) is significant for all periods. This significance of the variance ratio showed that the null hypothesis of the random walk i.e. daily and weekly stock returns follow random walk is rejected under homoscesdicity. In case of monthly returns the standardized VR (Variance ratio) test statistics for Z^* (q) is significant for q=2, q=4, q=8, q=12, periods. This significance of the variance ration showed that the null hypothesis of the random walk i.e. monthly stock returns follow random walk is rejected for all periods (q) under homoscesdicity. The results of the powerful variance ratio test statistics are also described in the form of graph under the assumption of hetereoscedasticity and homoscedasticity.

Fig-4.4: Daily returns

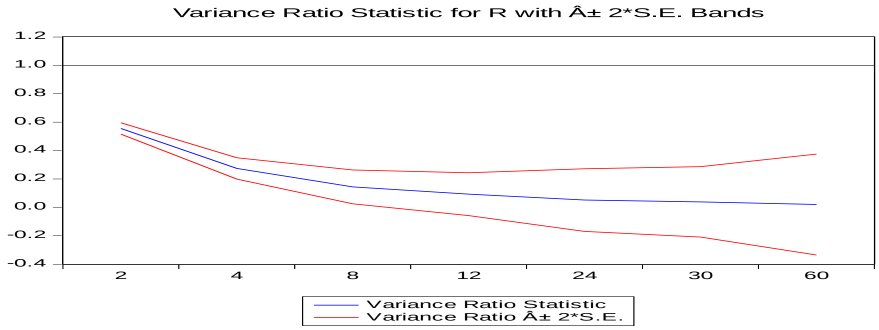


Fig-4.5: Weekly returns

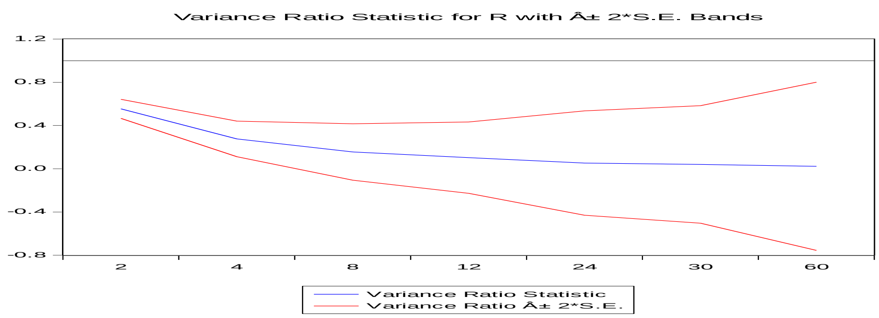
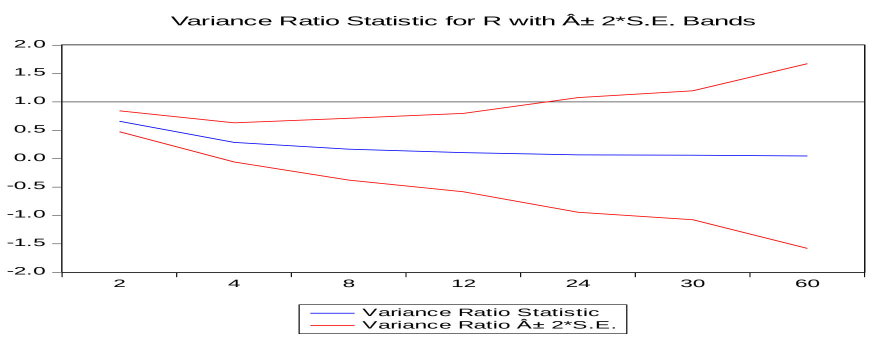


Fig-4.6: Monthly returns



The given graph below shows the variance ratio statistics for daily, weekly and monthly returns under the assumption of homoscesdicity and plus or minus two asymptotic standard error bands, along with a horizontal reference line at 1 representing the null hypothesis. Here the null reference line lies inside the bands which reject the random walk hypothesis with homoscesdicity that is a null hypothesis.

4.1.6 Discussion of results of weak form of efficiency

The results of weak from of efficiency for daily, weekly and monthly returns in Pakistani stock market are presented in Table 4.2 to Table 4.9 using parametric and non-parametric tests for examining random walks i.e., Jarque-Bera and Kolmogrov-Smirnov (KS) test for normality, autocorrelation and Run test for autocorrelation, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) for stationarity and multiple variance ratio (MVR) tests. The normality tests of data Jarque-Bera and KS test suggest that there is a predictability element for returns. Jarque-Bera and KS test results are consistent with Hassan et al. (2007) and Hamid et al. (2010).

The autocorrelation functions and Q-Ljung box statistics confirm that there exists autocorrelation in daily and weekly returns. But, for monthly returns no correlation exists for any lag. Run test also confirms the same results of autocorrelation for daily, weekly and monthly returns series. Autocorrelation results are consistent with Dickinson and Muragu (1994), Hassan et al. (2007). ADF and Phillips-Perron are used for unit root, both tests report that daily, weekly and monthly returns are stationary at level. ADF and Phillips-Perron results are consistent with Mookerjee and Yu (1999), Hassan et al. (2007) and Hamid et al. (2010).

Finally, the results of MVR test reveal that series does not follow random walk. These results of MVR test are consistent with Urrutia (1995) and Hamid et al. (2010). The results of this study indicate that by using all approaches none of the returns (daily, weekly and monthly) are following random walk and it is concluded that Pakistani stock market is not weak form efficient. Therefore, it is concluded that investors have an opportunity to get benefit from the predictable behavior of this market. The hypothesis 1 is rejected that Pakistani stock market is weak form efficient.

4.2 Results of Stock price synchronicity and information environment variables:

Section 4.2 reports the results of SPS and information variable for sample period from 2002 to 2012. To understand the nature of information environment and how it is associated with SPS, analysis is begin with simple sorts of stocks into R-square sorted portfolios. To calculate portfolio average, all stocks are sorted into R-square and divided in to five portfolios on the basis of market model R square in ascending order at the end of June each year. The average for each variable is calculated each year in the sample and the time-series mean of the portfolio.

4.2.1 Summary Statistics for SPS Portfolios

Results of Table 4.10 indicate that average R-square for low and high portfolios is 0.002 and 0.328, respectively. The average R-square for the entire sample is 0.106 based on weekly returns, which is lower than the average R-square of 0.20 of Roll (1988), which is based on daily returns. Whereas, close to average R-square of 0.146 in Kelly (2007), which is based on weekly returns. This low sample R-square is consistent with the increase in idiosyncratic return volatility reported by Campbell et al. (2001) and Kelly (2007). In consistent with the findings of Roll (1988) and Kelly (2007) size is increasing with the increase in R-square or decrease in idiosyncratic return volatility.

Table 4.10 also shows that relative to high R-square stocks those stocks having low R-square tend be small, illiquid and have low trading costs. Low R-square stocks receive low attention from institutions. Low R-square stocks have approximately 50% of the shares held by large institutions as compared to 56.5 % for high R-square stocks. The average trading cost is less for low R-square stocks, while higher for high R-square stocks. Average daily turnover rate, average Volume and average value traded is lower for lower R-square stock, which indicates that low R-square stocks are less liquid as compare to high R square stocks.

Table 4.10: Summary Statistics for SPS Portfolios for the period of 2002 to 2012

	R^2 portfolio rank					
Variables	**1**	**2**	**3**	**4**	**5**	**All Portfolios**
Avg R^2	0.002	0.016	0.052	0.132	0.328	0.106
ln(r2/1-r2)	-6.420	-4.201	-2.944	-1.898	-0.749	-3.242
Ins. Own.	0.499	0.500	0.469	0.511	0.565	0.509
Age	24.403	23.918	23.502	22.573	23.361	23.551
Trade cost	1.901	2.493	1.926	2.213	3.109	2.328
Size (x10^6)	2666	3493	2954	4343	18274	6346
BTM	0.309	0.580	0.992	0.331	0.755	0.593
Vol.	53627	36275	65116	216326	2751362	624541
Turn. rate	0.001	0.001	0.002	0.005	0.012	0.004
Value traded (x10^6)	1.864	1.774	1.985	7.487	215.773	45.776
Illiq.	0.017	0.015	0.013	0.007	0.003	0.011
Zero Vol.	0.573	0.513	0.408	0.227	0.104	0.365
Daily Ret.	-0.002	-0.003	-0.001	0.000	0.000	-0.001
Weekly Ret.	0.002	0.001	0.001	0.001	0.001	0.001
Monthly Ret.	0.006	0.005	0.006	0.005	0.004	0.005
Abs. Ret.	0.056	0.052	0.041	0.031	0.023	0.040

Note:

**Avg R2 is average R square of the firms, Inst. Own. is percentage of Institutional ownership, Age is Number of years listed at stock market, TC is Trading cost, Size is Firm size, BTM is Book to market ratio, Vol is yearly average of daily volume, Turn. Rate is percentage of turnover rate, Value traded is the yearly average value of share traded daily, Illiq is Amihud Illiquidity, Zero Vol is percentage of zero volume days, Daily ret is yearly average of daily returns, Weekly ret., is yearly average of weekly returns, Monthly ret. is is yearly average of monthly returns, Abs ret is is yearly average of daily absolute return.*

***To calculate R-square, the following regression is regressed for each stocks in each year:* $R_{i,t} = \alpha_i + R_{MKT\neq i,t}$ *, where* $R_{MKT\neq}$ *i,t is the value weighted market return . Each year non-financial, non-utility stocks which are ordinary shares and listed on KSE with 52 weeks of weekly returns are sorted into five KSE-breakpoint portfolios based on R-square. For each data item from 2002 through 2012 averages are calculated for each R-square portfolio, for each year t. The average across all 11-years is presented in the table 1. Size is the market capitalization at the end of June in each year. Age is the number of years listed on KSE at the end of June in year. Institutional ownership is the percentage of shares outstanding held by institutions at the end of each year. Trading cost is a measure for year t the yearly average of the difference between the highest trading price of the day and lowest trading price of the day. Zero volume days (%) is the percentage of the trading days with non-missing volume equal to zero in zero in year t. Average daily volume is the average volume on all trading days at time t . Turnover is the year t average turnover which is defined as the percentage of shares outstanding, traded on a given day.*

Average daily turnover for low R-square stocks is lower than the higher R-square stocks (i.e. lowest value for low R square stocks is 0.001 and highest value for highest R square stocks is 0.012), in which there are no trades for low R-square stocks on 57.3 % of trading days in the year. Average daily Volume for the year in low R-square stocks is 53 thousand shares approximately and 2.7 million shares approximately for highest R-square stocks. Average value traded rupees 45.78 million and the lowest R-square stocks have rupees 1.8 million value traded and the highest R-square stocks have rupees 215.77 million value traded. Consistent with the findings of Kelly (2007) all trading activity measures indicate that low R square stocks are less liquid as compare to high R square stocks.

The illiquidity measure also confirms the same and consistent behavior of low R-square and high R-square stocks. Amihud (2002) illiquidity measure indicates that the ratio of average absolute return divided to average daily volume is 1.1% and low R-square stocks are high illiquid as compare to high R-square stocks (i.e., 1.7% versus 0.30%). The percentage of zero volume days' measure reports that are no trades for all average R-square stocks on 36.5 % of trading days in the year. The highest no trade days are 57.3% days for low R-square stocks and lowest no trade days are 10.4% for high R-square stocks. Average return on stocks earned by low R-square stocks is higher than high R-square stock on the basis of weekly and monthly averages. These stocks are consistent with the notion that low R-square stocks suffering from a poor quality information environment and face greater impediments to informed trade.

4.2.2 Descriptive Statistics of R-square, information environment variables and foreign investment

To check the statistical behavior of data descriptive statics is presented in table 4.11. Descriptive statistics include mean, standard deviation, Skewness, Kurtosis, Minimum values and Maximum values of all variables. Mean and median shows the central value of data while Standard deviation shows the volatility. Maximum and minimum values provide information about range. Skewness and Kurtosis show the normal distribution of the data. If Kurtosis is 3 then normal-distribution returns is mesokurtic. If kurtosis is >3 then pattern is leptokurtic and that are associated with simultaneously "peaked" and fat tail. But when kurtosis is less than 3 it is called platykurtic and that are associated with simultaneously "less peaked" and have "thinner tail".

Table 4.11: Descriptive Statistics for the period of 2002-2012

	Mean	Standard Error	Median	Standard Deviation	Kurtosis	Skewness	Min	Max
Avg R^2	0.106	0.043	0.052	0.135	2.999	1.740	0.001	0.419
Ins. Own.	0.509	0.024	0.515	0.077	-0.203	-0.074	0.388	0.622
Age	23.551	0.741	23.618	2.345	-0.217	-0.128	19.655	27.042
Trade cost	2.328	0.567	1.820	1.794	1.179	1.067	0.709	6.099
Size (x10^6)	6345.917	2617.827	3446.355	8278.295	6.380	2.425	911.847	27893.618
BTM	0.508	0.354	0.678	1.118	2.801	-0.958	-1.805	2.067
Vol. (x10^3)	624.541	438.368	76.084	1386.243	7.914	2.788	6.657	4248.556
Turn. rate	0.004	0.002	0.002	0.006	6.734	2.495	0.001	0.018
Value traded (x10^6)	45.776	37.174	2.392	117.554	8.852	2.960	0.296	369.936
Illiq.	0.011	0.003	0.008	0.009	0.676	1.046	0.002	0.028
Zero Vol.	0.365	0.064	0.396	0.204	-0.815	-0.376	0.041	0.623
Daily Ret.	-0.001	0.001	0.000	0.005	2.314	0.093	-0.009	0.005
Weekly Ret.	0.001	0.001	0.002	0.002	0.223	-0.268	-0.003	0.005
Monthly Ret.	0.005	0.003	0.007	0.010	0.233	-0.241	-0.011	0.021
Abs. Ret.	0.040	0.005	0.038	0.016	-0.117	0.576	0.020	0.069
%FI	0.124	0.005	0.000	0.205	0.432	1.419	0.000	0.681

Note:* *Descriptive is calculated for each data item from 2002 through 2012 and then averages the data.*
** *All variables are same as define in table 10 and %FI is percentage of foreign ownership divided by no of outstanding shares*

Table 4.11 exhibits the statistical behavior of the data for the period of 2002-2012. The average R square is 0.106 and market model explains 10.6% variation in stock returns and the highest R square for any firm's market model is 0.419 or 42% approximately and the lowest R square is 0.001 with a standard deviation of 0.135. That low R square shows market model's predictability power is low and it is a possibility that firm specific variables may contribute more or increase in idiosyncratic volatility (Campbell et al., 2001 and Kelly, 2007).

Table 4.11 also shows that the average institutional ownership is 0.509 or 51% approximately and the highest institutional ownership for a firm is 62.2% and the lowest institutional ownership is 38.9% with a standard deviation of 8% approximately. That shows in KSE most of the firms stocks are held by institutional investor. The average age of the firm listing at KSE stock exchange is about 23 years. On average trading cost per share is rupees 2, which is too high and that may restrict trading activities. The average firm size is rupees 6.3 billion and the highest market capitalization is 27.9 billion and lowest market capitalization is 9.11 billion.

Average daily turnover rate is 0.004 and the highest turnover rate of 1.8% and lowest turnover rate is 0.1% with a standard deviation of 0.6%. Average daily Volume is 0.624 million shares approximately with a standard deviation of 1.4 million. Where maximum volume of any firm is 4.2 million shares approximately and minimum volume of any firm is 6657 shares approximately. The average daily value traded in a day is rupees 45.78 million with a standard deviation of 117.55 million. Where the maximum stock traded value is rupees 369.936 million and the minimum stock traded value is rupees 0.296 million.

Amihud (2002) illiquidity measures average value indicates that the ratio of average absolute return divided to average daily volume is 1.1% with a standard deviation of 0.009. Where, highest and lowest values are 0.028, 0.002 respectively. The percentage of zero volume days' mean value reports that are no trades for 36.5 % of trading days in the year with a standard deviation of 20.4 %. The highest no trade days are 62.3% days and lowest no trade days are 4.1%. The highest average return on stocks earned on monthly averages and the lowest return earned on daily basis. On average 12.4% shares ownership is held by foreign investor. Mostly the values in the table 4.11 are showing the leptokurtic behavior that is greater than 3 with the maximum value of 8.852 and minimum value of -0.815. Furthermore, kurtosis shows that the data is simultaneously peaked and fat tail.

4.2.3 Cross-Sectional Correlation of information environment variables & average R-square

The simple correlation between R-square and the information environment of stocks is calculated every year and averages of yearly cross-sectional Pearson correlation coefficients are presented in table 4.12.

Table 4.12: Cross-Sectional Correlation of information environment variables & R-square

	R^2	Ins.	Age	Vol	Trate	Tcost	Size	BTM	VT	Illiq.	ZVol.	DRet.	MRet.	WRet.	ARet.
R^2	1														
Ins.	0.08	1													
Age	0.00	0.03	1												
Vol	0.55	0.00	-0.09	1											
Trate	0.48	0.08	-0.01	0.57	1										
Tcost	0.16	0.26	0.11	0.04	0.11	1									
Size	0.42	0.06	0.01	0.66	0.19	0.36	1								
BTM	0.03	0.04	-0.02	0.00	-0.02	0.00	0.00	1							
VT	0.53	0.05	0.04	0.71	0.66	0.18	0.52	0.00	1						
Illiq.	-0.14	-0.19	-0.13	-0.06	-0.03	-0.15	-0.10	-0.14	-0.07	1					
ZVol.	-0.53	-0.10	0.06	-0.28	-0.27	-0.21	-0.26	0.00	-0.21	0.19	1				
DRet.	-0.01	0.06	0.03	0.00	0.00	0.04	0.03	-0.03	0.00	-0.08	-0.04	1			
MRet.	-0.01	0.01	0.02	0.00	0.03	0.11	0.05	-0.01	0.01	-0.07	-0.07	0.48	1		
WRet.	-0.01	0.01	0.02	0.00	0.03	0.11	0.04	-0.01	0.01	-0.07	-0.05	0.46	0.91	1	
ARet.	-0.27	-0.19	-0.07	-0.13	-0.10	-0.20	-0.18	-0.16	-0.12	0.73	0.45	-0.10	-0.07	-0.04	1

Note:
**R2 is average R square of the firms, Inst. is percentage of Institutional ownership, Age is Number of years listed at stock market, Tcost is Trading cost, Size is Firm size, BTM is Book to market ratio, Vol is yearly average of daily volume, TRate is percentage of turnover rate, VT is the yearly average value of share traded daily, Illiq is Amihud Illiquidity, ZVol is percentage of zero volume days, Dret. is yearly average of daily returns, Wret., is yearly average of weekly returns, Mret. is is yearly average of monthly returns, Aret is is yearly average of daily absolute return.*
***Cross-sectional Pearson's correlation coefficients are calculated each year from 2002 through 2012. The correlation coefficients are averaged across all 11 years.*

The correlation between R-square and each of the information environment characteristics are indicating that R-square is positively correlated with percentage of Institutional ownership, Age of stocks listed at stock market, trading cost, Firm size, Book to market ratio, volume, turnover rate and Value traded. Whereas, negatively correlated with Amihud Illiquidity, percentage of zero volume days, yearly average of daily returns, yearly average of weekly returns, yearly average of monthly returns and yearly average of daily absolute. Consistent with the findings of Kelly (2007) and Roll (1988) strong correlation of variables (Average Volume, Turnover rate, average value traded, firm size and percentage of zero volume days) is found with R-square.

Results also indicate that low correlation of variables (percentage of Institutional ownership, Age, trading cost, Book to market ratio, Amihud Illiquidity and returns) exist with R-square. Kelly (2007) has stated that "if small firms are less exposed to systematic risk than large firms and large firms are not associated with information environment quality" then association of size must be controlled. To control size, stocks are further sorted on the basis of size in table 4.13.

4.2.4 Average of information environment variables for Size and Dependent Sorted and R-square

Table 4.13 presents the means of highest to lowest R-square portfolios from 1 to 5 in each size rank portfolio from 1 to 3 and their differences. In each year t, stocks are sorted into five portfolios based on the firm size at the end of year t-1. Within each five Size based portfolios are sorted into portfolios based on R-square measured through market model regression described in table 4.10. The difference between the portfolio 3 and portfolio 1 for each variable is also reported.

Table 4.13: Average of information environment variables for Size and Dependent Sorted and R-square

			R^2								
			R^2 Rank						**Turnover (%)**		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	0.004	0.004	0.006	0.016	0.036	1	0.14	0.16	0.11	0.11	0.10
2	0.023	0.030	0.048	0.098	0.197	2	0.13	0.29	0.11	0.40	0.51
3	0.113	0.139	0.176	0.245	0.458	3	0.22	0.42	0.29	1.34	1.63
	0.110	0.135	0.170	0.229	0.422		0.09	0.26	0.18	1.22	1.53
			Size in Millions (Rs.)						**Average value traded in Millions**		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	78.0	308.2	893.9	3415.9	21046.9	1	0.085	0.487	0.699	2.538	10.903
2	73.9	303.8	913.0	3460.3	23909.0	2	0.090	0.562	0.882	9.668	121.737
3	78.7	317.5	933.5	3383.0	36510.8	3	0.221	1.486	2.603	29.068	510.252
	0.8	9.3	39.6	-32.9	15463.9		0.136	0.999	1.904	26.530	499.348
			Age in Years (listed at KSE)						**Amihud illiquidity**		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	23.48	24.35	22.74	26.49	24.47	1	0.042	0.004	0.001	0.001	0.001
2	24.02	23.04	24.37	23.35	26.85	2	0.045	0.006	0.003	0.001	0.001
3	20.98	20.57	19.53	21.50	26.56	3	0.034	0.009	0.005	0.002	0.001
	-2.50	-3.77	-3.21	-4.99	2.09		-0.008	0.005	0.004	0.001	0.000
			Institutional Ownership.						**Zero Volume Trading Days (%)**		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	0.41	0.48	0.48	0.58	0.71	1	67	60	50	44	33
2	0.40	0.49	0.47	0.47	0.69	2	57	53	40	22	14
3	0.41	0.49	0.46	0.54	0.59	3	43	34	15	10	2
	0.01	0.01	-0.02	-0.04	-0.12		-24	-27	-34	-33	-30
			Trading Cost (Rs.)						**Book to Market ratio**		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	0.290	0.632	1.057	2.305	10.957	1	1.171	1.390	1.015	0.820	0.315
2	0.335	0.733	1.050	2.349	7.440	2	0.088	1.028	1.107	0.834	0.463
3	0.340	0.597	0.924	2.375	3.639	3	0.840	0.529	0.902	0.877	0.753
	0.050	-0.035	-0.133	0.071	-7.318		-0.331	-0.861	-0.113	0.057	0.438
			Volume (In thousands)						**Average daily return. (%)**		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	8.6	17.8	20.5	25.3	318.7	1	-0.630	-0.248	0.067	0.367	0.157
2	14.6	32.5	72.5	210.2	1741.3	2	-0.929	-0.395	0.017	0.111	0.047
3	29.2	115.3	258.1	918.3	5616.2	3	-0.386	-0.012	0.049	0.029	0.030
	20.6	97.5	237.6	893.0	5297.5		0.245	0.236	-0.018	-0.339	-0.127
			Average monthly return. (%)						Average Weekly return. (%)		
Size Rank	1	2	3	4	5	Size Rank	1	2	3	4	5
1	-0.176	0.323	1.186	1.456	1.633	1	-0.002	0.097	0.243	0.320	0.345
2	-0.550	0.479	0.907	0.742	0.809	2	-0.082	0.079	0.257	0.209	0.177
3	-1.215	0.219	0.752	0.490	0.744	3	-0.323	0.055	0.142	0.093	0.165
	-1.039	-0.104	-0.435	-0.966	-0.889		-0.321	-0.042	-0.100	-0.228	-0.180

Table 4.13: Average of information environment variables for Size and Dependent Sorted and R-square (Conti.)

Average Absolute Return (%)					
Size Rank	**1**	**2**	**3**	**4**	**5**
1	8.903	3.964	3.292	3.521	3.076
2	8.465	4.339	2.994	2.418	1.808
3	6.160	3.642	2.688	2.254	1.865
	-2.744	-0.323	-0.604	-1.267	-1.211

For each size and R-square portfolio stocks are pooled across all years and the equally weighted average is presented in above table. The row labeled “one to five” is the difference between the high R-square portfolio and low R-square portfolio. The differences between the extreme R-square portfolios for each of the information environment characteristics (institutional ownership, trade cost, size, turnover rate, Volume, Value traded, book to market ratio, zero volume, returns and Amihud illiquidity) are significantly different from zero and in the direction consistent with the portfolio averages of Table 4.11 and the correlations of Table 4.12 for all characteristics. Table 4.13 also shows the strong relationship between size and each environment characteristics. These results suggest that even when controlling for the relation between size and each of the environment characteristics mentioned above, a low R-square corresponds with an information environment less conducive to rapid information incorporation.

4.2.5 Regression of SPS on information environment variables

To test the impact of information environment variables on SPS cross section regressions are run on the information environment characteristics. In order to control for the fact, the dependent variable, R-square, is bounded, in this study same methodology is followed as earlier used by Durnev, Morck, and Yeung (2004), Dasgupta et al. (2010) and Kelly (2007). Hence, instead of using R-square this study has used log transformation ratio of the explained variance to unexplained variance SPS i.e. $\ln(R^2/1-R^2)$ to create continuous variable that has more normal distribution than distribution of R^2 values that are bounded by 0 and 1 (Piotroski and Roulstone, 2004; Ashbaugh-Skaife et al., 2006 and Kelly, 2007).

In addition to this all dependent variables of information environment are log transformation. So, all interpretations of regression coefficients are to be interpreted as elasticity. Because most of the variables like, institutional ownership, trade cost, turnover ratio, zero volume, returns and Amihud illiquidity can all have legitimate zero values. Hence, to overcome this issue a constant can be added in such variables and adding a constant alters the interpretation marginally, but it does not change the sign of the coefficients (Kelly, 2007). So, a constant is added in all variables that is one plus maximum negative value, prior to taking the log. Table 4.14to table 4.16 and appendix C present the time series coefficients, the model fit statistics (adjusted R-square) and variable significance statistics (P values) and T-stats.

4.2.5.1 Time series cross-sectional regression of SPS on information environment variables

The results of common effect model for ratio of SPS and information environment variables are presented in table 4.14. The results for model 1 to model 10 are presented in table 4.14a have the following econometric models:

Model 1

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{VT})_{it} + \beta_8 \ln(\mathrm{Turnover\ rate})_{it} + \beta_9 \ln(\mathrm{ill})_{it} + \beta_{10} \ln(\%\mathrm{zero})_{it} + \beta_{11} \ln(\mathrm{DR})_{it} + \beta_{12} \ln(\mathrm{WR})_{it} + \beta_{13} \ln(\mathrm{MR})_{it} + \beta_{14} \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 2

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{DR})_{it} + \delta_{it}$$

Model 3

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \delta_{it}$$

Model 4

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \delta_{it}$$

Model 5

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 6

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 7

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 8

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \delta_{it}$$

Model 9

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \delta_{it}$$

Model 10

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \delta_{it}$$

In case of common effect model, results of model 1 to model 10 report adjusted R square between “0.38 to 0.40” approximately. These adjusted R squares indicate that information environment variables have 38% to 40% explanatory power of the models. So, these models based on information environment variables can explain a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified.

Table 4.14a: Time series cross-sectional regression of SPS on information environment variables for the period of 2002 to 2012

	1	2	3	4	5	6	7	8	9	10
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coef.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	1.929	-0.094	-0.076	-0.105	3.322	3.334	3.307	0.407	0.412	0.399
Prob.	(0.056)	(0.733)	(0.780)	(0.699)	(0.000)	(0.000)	(0.000)	(0.049)	(0.044)	(0.051)
Ins. Own.	0.002	0.008	0.009	0.009	0.003	0.003	0.004	0.003	0.003	0.003
Prob.	(0.932)	(0.699)	(0.684)	(0.685)	(0.886)	(0.879)	(0.864)	(0.890)	(0.886)	(0.870)
Age	-0.014	-0.009	-0.008	-0.008	-0.013	-0.013	-0.013	-0.014	-0.013	-0.013
Prob.	(0.116)	(0.328)	(0.339)	(0.330)	(0.126)	(0.128)	(0.127)	(0.117)	(0.118)	(0.118)
Trade cost	0.015	0.028	0.027	0.028	0.028	0.027	0.027	0.027	0.027	0.027
Prob.	(0.165)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	0.013	0.016	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.017
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BTM	0.021	0.016	0.017	0.017	0.020	0.020	0.021	0.019	0.019	0.020
Prob.	(0.556)	(0.641)	(0.636)	(0.623)	(0.570)	(0.568)	(0.545)	(0.579)	(0.577)	(0.556)
Vol.	0.034	0.044	0.043	0.044	0.043	0.043	0.043	0.043	0.043	0.043
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turn. rate	-0.529									
Prob.	(0.041)									
Value	0.013									
Prob.	(0.037)									
Illiq.	0.061	-0.027	-0.025		-0.039	-0.037		-0.035	-0.035	
Prob.	(0.713)	(0.825)	(0.839)		(0.748)	(0.756)		(0.769)	(0.775)	
Zero Vol.	-0.005	0.012		0.012	0.006		0.006	0.004		0.004
Prob.	(0.856)	(0.623)		(0.629)	(0.798)		(0.809)	(0.872)		(0.882)
Daily Ret.	0.122	-0.550	-0.561	-0.541						
Prob.	(0.717)	(0.086)	(0.079)	(0.088)						
Weekly	-3.015				-5.471	-5.482	-5.459			
Prob.	(0.090)				(0.000)	(0.000)	(0.000)			
Monthly	-0.635							-1.261	-1.263	-1.258
Prob.	(0.123)							(0.000)	(0.000)	(0.000)
Abs. Ret.	0.122									
Prob.	(0.425)									
Adj. R	0.399	0.382	0.382	0.382	0.397	0.398	0.398	0.397	0.398	0.398
F stat.	80.384	115.58	130.06	130.10	123.44	138.94	138.94	123.42	138.93	138.92
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note:

** Inst. Own. is percentage of Institutional ownership, Age is Number of years listed at stock market, Trade Cost is Trading cost, Size is Firm size, BTM is Book to market ratio, Vol is yearly average of daily volume, Turn. Rate is percentage of turnover rate, Value is the yearly average value of share traded daily, Illiq is Amihud Illiquidity, Zero Vol is percentage of zero volume days, Daily ret is yearly average of daily returns, Weekly ret., is yearly average of weekly returns, Monthly ret. is is yearly average of monthly returns, Abs ret is yearly average of daily absolute return and prob. is the value indicating the marginal probability of type 1 error*.

Results of table 4.14a indicate that Institutional ownership, age, BTM ratio, Amihud illiquidity and percentage of zero volume days are not statistically different from zero as estimated by model 1 to model 10 and trading cost is also insignificant for model 1. But, trading cost is statistically significant and positive for model 2 to model 10. The beta coefficients of trading cost have the values between “0.027 to 0.028”. This indicates that 1% increase in trading cost can increase SPS by “0.027 to 0.028” percent and 1-unit increase in trading cost leads to increase SPS by 0.019 units. Size is also statistically significant and positive that means it is different from zero for each of the model 1 to model 10. The beta coefficients of size have the values from “0.013 to 0.017”. That means 1% increase in size can increase SPS by “0.013 to 0.017” percent and 1-unit increase in size leads to increase SPS by “0.009 to 0.012” units.

Volume is also statistically significant and positive in model 1 through model 10 with beta coefficients between “0.034 to 0.044”. That means 1% increase in volume can increase SPS by “0.034 to 0.044” percent and 1-unit increase in volume leads to increase SPS by “0.024 to 0.031” units. The turnover rate and value traded are also statistically significant in model 1. Daily, monthly and absolute returns are statistically significant and negative for all the models except model 1. Overall results of average returns for model 1 to 10 have consistent behavior except absolute retunes with positive coefficient due to absolute values.

The results for model 11 to model 19 are presented in table 4.14b have the following econometric models:

Model 11

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 12

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 13

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 14

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{DR})_{it} + \delta_{it}$$

Model 15

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \delta_{it}$$

Model 16

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \delta_{it}$$

Model 17

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 18

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 19

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Under the assumption of constant intercept, results of table 4.14b from model 11 to model 19present adjusted R square between "0.20 to 0.38" approximately. These adjusted R squares indicate that information environment variables have "20% to 38%" explanatory power of the models. The adjusted R squares of model 11 to model 19are consistent with the adjusted R squares of model 1 to model 10. So, these models based on information environment variables can also explain a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified.

Table 4.14b: Time series cross-sectional regression of SPS on information environment variables for the period of 2002 to 2012

	11	12	13	14	15	16	17	18	19
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-0.485	-0.480	-0.490	0.560	0.326	0.697	4.499	4.321	4.633
Prob.	(0.003)	(0.003)	(0.003)	(0.060)	(0.291)	(0.017)	(0.000)	(0.000)	(0.000)
Ins. Own.	0.008	0.008	0.009	-0.005	-0.023	-0.010	-0.012	-0.030	-0.017
Prob.	(0.716)	(0.707)	(0.695)	(0.832)	(0.346)	(0.688)	(0.609)	(0.222)	(0.478)
Age	-0.008	-0.008	-0.008	-0.017	-0.028	-0.018	-0.022	-0.033	-0.022
Prob.	(0.360)	(0.367)	(0.364)	(0.075)	(0.004)	(0.065)	(0.020)	(0.001)	(0.017)
Trade cost	0.028	0.027	0.028	-0.029	-0.018	-0.027	-0.028	-0.018	-0.027
Prob.	(0.001)	(0.001)	(0.001)	(0.001)	(0.038)	(0.001)	(0.001)	(0.037)	(0.001)
Size	0.016	0.016	0.016	0.035	0.048	0.033	0.036	0.049	0.034
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BTM	0.018	0.018	0.018	0.000	-0.016	-0.009	0.004	-0.012	-0.005
Prob.	(0.619)	(0.611)	(0.603)	(0.993)	(0.694)	(0.811)	(0.907)	(0.767)	(0.897)
Vol.	0.044	0.043	0.044						
Prob.	(0.000)	(0.000)	(0.000)						
Turn. rate				1.323	1.617	1.321	1.465	1.755	1.466
Prob.				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Value traded									
Prob.									
Illiq.	-0.062	-0.069		0.305	0.397		0.293	0.375	
Prob.	(0.670)	(0.633)		(0.022)	(0.004)		(0.025)	(0.006)	
Zero Vol.	0.009		0.010	-0.256		-0.259	-0.258		-0.260
Prob.	(0.739)		(0.692)	(0.000)		(0.000)	(0.000)		(0.000)
Daily Ret.				-0.764	-0.509	-0.869			
Prob.				(0.029)	(0.160)	(0.012)			
Weekly Ret.							-6.450	-6.134	-6.553
Prob.							(0.000)	(0.000)	(0.000)
Monthly Ret.									
Prob.									
Abs. Ret.	0.117	0.134	0.082						
Prob.	(0.439)	(0.351)	(0.519)						
Adj. R	0.381	0.381	0.381	0.263	0.204	0.261	0.284	0.225	0.283
F stat.	115.160	129.610	129.596	67.310	54.650	74.877	74.787	61.485	83.300
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All variables are the same as defined in table 4.14a.

Results of table 4.14bshow that Institutional ownership, BTM and absolute returns are not statistically different from zero for each of the model in model 11 to model 19. While, age is statistically different from zero for model 14 to model 19 and insignificant for model 11, model 12 and model 13. The beta coefficients of age have the values between “-0.008 to -0.033”. This indicates that 1% increase in age can decrease SPS by “0.008 to 0.033” percent and 1-unit increase in age leads to decrease SPS by “0.005 to 0.023” units. Trading cost is statistically significant for model 11 to model 19 and the beta coefficient values are between "-0.018 to -0.029". This indicates that 1% increase in trading cost can decrease SPS by "0.018 to 0.029" percent and 1-unit increase in trading cost leads to decrease SPS by "0.012 to 0.020" units.

Size is statistically significant that means it is different from zero for each of the model from 11 to 19. The beta coefficients have the values between "0.016 to 0.049". This indicates that 1% increase in size can increase SPS by "0.016 to 0.049" percent and 1-unit increase in size leads to increase SPS by "0.011 to 0.035" units. Volume is also statistically significant and positive for model 11, model 12 and model 13. The beta coefficient values are between "0.043 to 0.044". This indicates that 1% increase in volume can increase SPS by "0.043 to 0.044" percent and 1-unit increase in volume leads to increase SPS by "0.030 to 0.031" units. Turnover rate is significant and positive for model 14 to 19 with beta values from "1.321 to 1.755". This indicates that 1% increase in turnover rate can increase SPS by "1.321 to 1.755" percent and 1-unit increase in turnover rate leads to increase SPS by "1.50 to 2.38" units.

Amihud illiquidity is also significant and positive for model 14, model 15, model 17 and model 18, with beta coefficients from "0.293 to 0.397". This indicates that 1% increase in Amihud illiquidity can increase SPS by "0.293 to 0.397" percent and 1-unit increase in Amihud illiquidity leads to increase SPS by "0.22 to 0.32" units. Whereas, Amihud illiquidity is insignificant for model 11 and model 12. percentage of zero volume days has statistically significant beta values for model 14, model 16, model 17 and model 19 and percentage of zero volume days' beta is insignificant for model 11 and model 13. The beta coefficients have the values between "-0.256 to -0.260". This indicates that 1% increase in percentage of zero volume days can decreases PS by "0.256to 0.260" percent and1-unit increase in percentage of zero volume days leads to decrease SPS by "0.16 to 0.17" units.

Daily return beta coefficients are significant for model 14, and 16. The beta coefficients have the values between "-0.764 to -0.869". This indicates that 1% increase in daily return can decrease SPS by "0.764 to 0.869" percent and1-unit increase in daily return leads to decrease SPS by "0.41 to 0.45" units. Overall results of average returns both daily and weekly returns for model

11 to 19 have consistent behavior except absolute retunes with positive coefficient due to absolute values.

The results for model 20 to model 28 are presented in table 4.14c have the following econometric models:

Model 20

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \delta_{it}$$

Model 21

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

Model 22

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

Model 23

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 24

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 25

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 26

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \delta_{it}$$

Model 27

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

Model 28

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

In case of polled regression, results of table 4.14c from model 20 to model 28 have adjusted R square between "0.20 to 0.36" approximately. These adjusted R squares indicate that information environment variables have 20% to 36% explanatory power of the models. The adjusted R squares of model 20 to model 28are consistent with the adjusted R squares of model 1 to model 19. So, these models based on information environment variables can explain a significant portion of the dependent variable and model fitness statistics are statistically significant.

Table 4.14c: Time series cross-sectional regression of SPS on information environment variables for the period of 2002 to 2012

	20	21	22	23	24	25	26	27	28
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	1.095	0.976	1.174	-0.023	-0.011	-0.017	-0.094	-0.194	0.200
Prob.	(0.000)	(0.000)	(0.000)	(0.895)	(0.953)	(0.925)	(0.736)	(0.483)	(0.464)
Ins. Own.	-0.012	-0.030	-0.017	-0.005	-0.023	-0.006	-0.005	-0.008	-0.013
Prob.	(0.600)	(0.217)	(0.470)	(0.820)	(0.343)	(0.793)	(0.837)	(0.703)	(0.552)
Age	-0.022	-0.034	-0.023	-0.016	-0.027	-0.016	-0.008	-0.009	-0.009
Prob.	(0.017)	(0.001)	(0.014)	(0.089)	(0.005)	(0.087)	(0.391)	(0.307)	(0.292)
Trade cost	-0.028	-0.018	-0.027	-0.029	-0.018	-0.028	-0.029	-0.027	-0.027
Prob.	(0.001)	(0.039)	(0.001)	(0.001)	(0.039)	(0.001)	(0.000)	(0.001)	(0.001)
Size	0.036	0.050	0.034	0.036	0.047	0.036	0.006	0.006	0.003
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.071)	(0.055)	(0.398)
BTM	0.004	-0.012	-0.005	0.007	-0.018	0.006	0.009	0.007	-0.010
Prob.	(0.913)	(0.760)	(0.891)	(0.852)	(0.658)	(0.873)	(0.801)	(0.856)	(0.781)
Vol.									
Prob.									
Turn. rate	1.466	1.756	1.467	1.307	1.613	1.305			
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Value traded							0.044	0.047	0.042
Prob.							(0.000)	(0.000)	(0.000)
Illiq.	0.293	0.376		0.082	0.478		0.608	0.651	
Prob.	(0.025)	(0.006)		(0.604)	(0.003)		(0.000)	(0.000)	
Zero Vol.	-0.259		-0.261	-0.274		-0.276	-0.067		-0.081
Prob.	(0.000)		(0.000)	(0.000)		(0.000)	(0.004)		(0.001)
Daily Ret.							-0.535	-0.465	-0.749
Prob.							(0.098)	(0.150)	(0.020)
Weekly Ret.									
Prob.									
Monthly Ret.	-1.538	-1.452	-1.561						
Prob.	(0.000)	(0.000)	(0.000)						
Abs. Ret.				0.483	-0.107	0.530			
Prob.				(0.003)	(0.508)	(0.000)			
Adj. R	0.286	0.226	0.284	0.265	0.204	0.265	0.368	0.365	0.359
F stat.	75.391	61.890	83.976	67.904	54.408	76.392	109.146	121.216	118.188
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All variables are the same as defined in table 4.14a.

Results of table 4.14c indicate that Institutional ownership and BTM are not statistically different from zero as estimated by model 20 to 28.While,beta coefficient values of age are statistically significant for model 20 to model25 and are insignificant for model 26, model27 and model28.The significant beta coefficients have the values between “-0.016 to -0.034”.This indicates that 1% increase in age can decrease SPS by “0.016 to 0.034” percent and1unit increase in age leads to decrease SPS by “0.011 to 0.023” units. Trading cost is statistically significant and negative for model 20 to model 28 and has beta coefficient values from "-0.018 to -0.029". This indicates that 1% increase in trading cost can decrease SPS by "0.018 to 0.029" percent and 1-unit increase in transaction cost leads to increase SPS by "0.013 to 0.020" units. Size is statistically different from zero as estimated by model 20 to model 27. The beta coefficients have the values from "0.003 to 0.050". This indicates that 1% increase in size can increase SPS by "0.003 to 0.050" percent and 1-unit increase in size leads to increase SPS by "0.002 to 0.035" units. Turnover rate is statistically significant and positive for model 20 to 25 and has beta coefficient values from "1.305 to 1.756". This indicates that 1% increase in turnover rate can increase SPS by "1.305 to 1.756" percent and 1-unit increase in turnover rate leads to increase SPS by "1.47 to 2.06" units.

Amihud illiquidity is statistically significant and positive for model 20, model 21, model 24, model 26 and model 27 and has beta coefficient values from "0.293 to 0.651". This indicates that 1% increase in Amihud illiquidity can increase SPS by "0.293 to 0.651" percent and 1-unit increase in Amihud illiquidity leads to increase SPS by "0.06 to 0.57" units. Percentage of Zero volume days has statistically significant beta coefficient for model 20 to model 28 except model 21, model 24 and model 27. The beta coefficients have the values between "-0.067 to -0.276". This indicates that 1% increase in percentage of zero volume days can decrease SPS by "0.067 to 0.276" percent and 1-unit increase in percentage of zero volume days leads to decrease SPS by "0.05 to 0.17" units.

Monthly return is significant for model 20, model 21 and model 22. The beta coefficients have the values from "-1.452 to -1.561". This indicates that 1% increase in monthly return can decrease SPS by "1.452 to 1.561" percent and 1-unit increase in monthly return leads to decrease SPS by "0.43 to 0.47" units. Overall results of average returns both daily and weekly for model 20 to 28 have consistent behavior except absolute retunes with positive coefficient due to absolute values.

The results for model 29 to model 37 are presented in table 4.14d have the following econometric models:

Model 29

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 30

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 31

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \delta_{it}$$

Model 32

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \delta_{it}$$

Model 33

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \delta_{it}$$

Model 34

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \delta_{it}$$

Model 35

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 36

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 37

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

In case of common effect model, results of regression from model 29 to model 37 have adjusted R square is between "0.36 to 0.38" approximately. These adjusted R squares indicate that information environment variables have 36% to 38% explanatory power of the models. The adjusted R squares of model 29 to model 37are consistent with the adjusted R squares of model 1 to model 28. So, these models based on information environment variables can explain a significant portion of the dependent variable and model fitness statistics are also significant.

Table 4.14d: Time series cross-sectional regression of SPS on information environment variables for the period of 2002 to 2012

	29	30	31	32	33	34	35	36	37
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	3.564	3.436	3.855	0.475	0.397	0.652	-0.483	-0.521	-0.425
Prob.	(0.000)	(0.000)	(0.000)	(0.022)	(0.056)	(0.002)	(0.004)	(0.002)	(0.010)
Ins. Own.	-0.010	-0.014	-0.019	-0.010	-0.014	-0.019	-0.005	-0.009	-0.010
Prob.	(0.643)	(0.520)	(0.385)	(0.640)	(0.515)	(0.382)	(0.823)	(0.688)	(0.652)
Age	-0.013	-0.014	-0.014	-0.013	-0.014	-0.015	-0.007	-0.009	-0.008
Prob.	(0.151)	(0.108)	(0.105)	(0.139)	(0.099)	(0.096)	(0.423)	(0.335)	(0.358)
Trade cost	-0.029	-0.027	-0.027	-0.029	-0.027	-0.026	-0.029	-0.027	-0.028
Prob.	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Size	0.007	0.007	0.004	0.007	0.008	0.004	0.007	0.006	0.006
Prob.	(0.033)	(0.024)	(0.246)	(0.024)	(0.017)	(0.195)	(0.050)	(0.063)	(0.073)
BTM	0.013	0.010	-0.006	0.012	0.010	-0.006	0.011	0.007	0.005
Prob.	(0.716)	(0.774)	(0.866)	(0.724)	(0.784)	(0.857)	(0.749)	(0.853)	(0.895)
Vol.									
Prob.									
Turn. rate									
Prob.									
Value traded	0.044	0.047	0.042	0.043	0.047	0.042	0.043	0.047	0.042
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Illiq.	0.588	0.631		0.588	0.632		0.528	0.649	
Prob.	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Zero Vol.	-0.071		-0.084	-0.073		-0.086	-0.075		-0.098
Prob.	(0.002)		(0.000)	(0.001)		(0.000)	(0.002)		(0.000)
Daily Ret.									
Prob.									
Weekly Ret.	-5.812	-5.707	-6.024						
Prob.	(0.000)	(0.000)	(0.000)						
Monthly Ret.				-1.351	-1.319	-1.400			
Prob.				(0.000)	(0.000)	(0.000)			
Abs. Ret.							0.195	0.047	0.499
Prob.							(0.202)	(0.748)	(0.000)
Adj. R	0.386	0.383	0.378	0.386	0.383	0.378	0.368	0.365	0.363
F stat.	117.777	130.614	127.863	117.926	130.675	128.033	108.950	120.826	120.179
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All variables are the same as defined in table 4.14a.

Results of table 4.14d show that Institutional ownership, age and BTM are not statistically different from zero as estimated for model 29 to model 37. Trading cost is statistically significant and negative for model 29 to model 37 with beta coefficient values from “-0.026 to -0.029”. This indicates that 1% increase in trading cost can decrease SPS by “0.026 to 0.029” percent and1-unit increase in transaction cost leads to decrease SPS by “0.018 to 0.020” units. Size is also statistically significant and positive for all models except model 31 and model 34. The beta coefficients of size have the values from “0.006 to 0.008”. This indicates that 1% increase in size can increase SPS by “0.006 to 0.008” percent and 1-unit increase in size leads to increase SPS by “0.003 to 0.005” units.

Value traded is also significant and positive for model 29 to model 37 with beta coefficient values between “0.042 to 0.047”. This indicates that 1% increase in turnover rate can increase SPS by “0.042 to 0.047” percent and 1-unit increase in turnover rate leads to increase SPS by 0.03 units. Amihud illiquidity is statistically significant in model 29, model 30, model 32, model 33, model 35 and model 36 and insignificant for model 31, model 34 and model 37. The beta coefficients of Amihud illiquidity have the values from “0.528 to 0.649”. This indicates that 1% increase in Amihud illiquidity can increase SPS by “0.528 to 0.649” percent and1-unit increase in Amihud illiquidity leads to increase SPS by “0.44 to 0.57” units.

Percentage of Zero volume days has statistically significant beta coefficient for model 29, model31, model32, model34, model35 and model37 and insignificant for model 30, model 33 and model 36. The beta coefficients have the values between “-0.071 to -0.098”. This indicates that 1% increase in percentage of zero volume days can decrease SPS by “0.071 to 0.098” percent and 1-unit increase in percentage of zero volume days leads to decrease SPS by “0.05 to 0.07” units. Weekly return is significant in model 29, 30 and 31. The beta coefficients have the values between “-5.707 to -6.024”. This indicates that 1% increase in daily return can decrease SPS by “5.707 to 6.024” percent and 1-unit increase in weekly return leads to decrease SPS by 0.98 units. Overall results of average returns both weekly and monthly for model 29 to 37 have consistent behavior except absolute retunes with positive coefficient due to absolute values.

The overall regression results of table 4.14 indicate that institutional ownership is not statistically different from zero, BTM ratio is not statistically different from zero. The age is not statistically significant different from zero, but for some model in age has statistically significant and negative relationship with SPS. size has statistically significant and positive relationship with SPS, which captures the attention of traders means informed parties trading. Trading cost have mixed findings, but overall results suggest that when trading volume increases investor have not considered trading cost as restricted activity. But all other models present significant and negative impact of trading activity on SPS.

Overall results of liquidity (Volume, turnover rate and value traded) are statistically significant and positive. Overall results of illiquidity (Amihud illiquidity and percentage of zero volume) are statistically significant. The overall results suggest that Amihud illiquidity has a significant and positive relationship with SPS. But percentage of zero volume illiquidity has a significant and negative relationship with SPS. All return measure except absolute returns have significant and negative relationship with SPS. Because, movement in stock returns is a trading activity that generates fluctuation in firm specific return and decrease SPS. The coefficients of absolute returns are negative. This result is most likely due to construction of the variable, which are the absolute values.

4.2.5.2 Pool dummy regression of SPS on information environment variables for industry effect

The results for model 1 to model 6 for pool dummy variable analysis is presented in table 4.15a have the following econometric models:

Model 1

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 2

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 3

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 4

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 5

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 6

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.15a: Pool dummy regression with base industry of Automobile and Parts and SPS on information environment variables for the period of 2002 to 2012

	1 Coef	Prob.	2 Coef	Prob.	3 Coef	Prob.	4 Coef	Prob.	5 Coef	Prob.	6 Coef	Prob.
Const.	-0.05	0.84	-0.06	0.82	-0.07	0.81	0.46	0.03	0.44	0.03	0.45	0.03
Ins. Own.	0.01	0.54	0.01	0.56	0.01	0.53	0.01	0.65	0.01	0.69	0.01	0.63
Age	-0.01	0.13	-0.01	0.13	-0.01	0.14	-0.02	0.03	-0.02	0.03	-0.02	0.03
Trade cost	0.02	0.08	0.02	0.06	0.01	0.09	0.01	0.14	0.01	0.08	0.01	0.14
Size	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00
BTM	0.01	0.79	0.01	0.79	0.01	0.77	0.01	0.69	0.01	0.70	0.01	0.67
Vol.	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
Turn. rate												
Value traded												
Illiq.	-0.03	0.82	-0.03	0.81			-0.03	0.78				
Zero Vol.	-0.01	0.81			-0.01	0.81	-0.02	0.52	-0.04	0.77	-0.02	0.51
Daily Ret.	-0.50	0.11	-0.49	0.12	-0.49	0.12						
Weekly Ret.												
Monthly Ret.							-1.23	0.00	-1.23	0.00	-1.23	0.00
Abs. Ret.												
Chemicals	0.06	0.01	0.06	0.01	0.06	0.01	0.06	0.02	0.06	0.02	0.06	0.02
Construction and Materials	0.04	0.09	0.04	0.10	0.04	0.09	0.03	0.16	0.03	0.19	0.03	0.16
Electricity	0.00	0.94	0.00	0.93	0.00	0.94	-0.02	0.55	-0.02	0.54	-0.02	0.55
Fixed Line Telecommunication	0.11	0.00	0.11	0.00	0.11	0.00	0.09	0.00	0.09	0.00	0.09	0.00
Food Producers	0.02	0.42	0.02	0.43	0.02	0.41	0.02	0.37	0.02	0.42	0.02	0.36
General Industries	0.04	0.11	0.04	0.11	0.04	0.11	0.04	0.11	0.04	0.13	0.04	0.11
Household Goods	-0.01	0.66	-0.02	0.64	-0.01	0.66	-0.02	0.53	-0.02	0.49	-0.02	0.53
Industrial Engineering	0.02	0.46	0.02	0.47	0.02	0.46	0.01	0.59	0.01	0.61	0.01	0.59
Oil and Gas	0.16	0.00	0.16	0.00	0.16	0.00	0.15	0.00	0.15	0.00	0.15	0.00
Personal Goods	0.03	0.15	0.03	0.15	0.03	0.15	0.03	0.17	0.03	0.21	0.03	0.18
Pharma and Bio Tech	0.04	0.14	0.04	0.14	0.04	0.14	0.04	0.19	0.04	0.19	0.04	0.19
Tobacco	0.03	0.37	0.03	0.38	0.03	0.37	0.04	0.23	0.04	0.26	0.04	0.23
Travel and Leisure	-0.01	0.72	-0.01	0.69	-0.01	0.71	-0.02	0.64	-0.02	0.57	-0.02	0.63
Adj. R	0.41		0.41		0.41		0.42		0.42		0.42	
F stat.	52.90		55.44		55.44		56.23		58.90		58.93	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note:
1) All the firm specific variables are the same as defined in table 4.14a.
2) Automobile and parts industry is used as reference industry and Chemicals is chemical industry, Construction and Materials is Construction and Materials industry, Electricity Fixed Line and Telecommunication is Electricity Fixed Line and Telecommunication industry, Food Producers is Food Producers industry, General Industries is General Industries, Household Goods is Household Goods industry, Industrial Engineering is Industrial Engineering industry, Oil and Gas is Oil and Gas industry, Personal Goods is Personal Goods industry, Pharma and Bio Tech is Pharmaceuticals and Bio Tech industry, Tobacco is Tobacco industry and Travel and Leisure is Travel and Leisure industry.

The above table presents the results of pool dummy variable analysis. In table 4.15a the results for model 1 to 6, where Automobile and parts industry is used as reference industry. The result shows that Chemical industry, Fixed Line industry and Oil and Gas industry have a significant different intercept in model 1 to model 6, while Construction and Material industry has a significantly different intercept value in model 1 and model 3. The Chemical industry has intercept value of 0.06 which means that average SPS is higher for Chemical industry than Automobile and parts industry. The Fixed Line industry has intercept values between "0.09 to 0.11" which means that average SPS is higher for Fixed Line industry than Automobile and parts industry. The Oil and Gas industry has intercept values between "0.15 to 0.16" which means that average SPS is higher for Oil and Gas industry than Automobile and parts industry. The Construction and Material industry has intercept value of 0.04 which means that average SPS is higher for Construction and Material industry than Automobile and parts industry. The overall results of table 4.15a reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry, Oil and Gas industry and Construction and Material industry. All other industries have statistically insignificant values, which mean there is no difference in SPS in comparison to Automobile and parts industry.

The results for model 7 to model 12 for pool dummy variable analysis are presented in table 4.15b having the following econometric models:

Model 7

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 8

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 9

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 10

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 11

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 12

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Table 4.15b: Pool dummy regression with base industry of Automobile and Parts and SPS on information environment variables for the period of 2002 to 2012

	7		8		9		10		11		12	
	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.
Const.	3.32	0.00	3.29	0.00	3.30	0.00	-0.41	0.01	-0.42	0.01	-0.42	0.01
Ins. Own.	0.01	0.65	0.01	0.69	0.01	0.63	0.01	0.56	0.01	0.59	0.01	0.54
Age	-0.02	0.03	-0.02	0.03	-0.02	0.03	-0.01	0.15	-0.01	0.15	-0.01	0.15
Trade cost	0.01	0.12	0.02	0.07	0.01	0.12	0.01	0.09	0.02	0.06	0.01	0.10
Size	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00
BTM	0.01	0.68	0.01	0.68	0.02	0.65	0.01	0.76	0.01	0.77	0.01	0.74
Vol.	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
Turn. rate												
Value traded												
Illiq.	-0.04	0.76	-0.04	0.75			-0.07	0.62	-0.06	0.66		
Zero Vol.	-0.01	0.57			-0.01	0.57	-0.01	0.71			-0.01	0.76
Daily Ret.												
Weekly Ret.	-5.37	0.00	-5.34	0.00	-5.36	0.00						
Monthly Ret.												
Abs. Ret.							0.13	0.39	0.11	0.43	0.09	0.48
Chemicals	0.06	0.01	0.06	0.01	0.06	0.01	0.06	0.01	0.06	0.01	0.06	0.01
Construction and Materials	0.04	0.11	0.04	0.12	0.04	0.11	0.04	0.10	0.04	0.11	0.04	0.10
Electricity	-0.01	0.61	-0.01	0.59	-0.01	0.60	0.00	0.95	0.00	0.93	0.00	0.93
Fixed Line Telecommunication	0.10	0.00	0.09	0.00	0.10	0.00	0.11	0.00	0.11	0.00	0.11	0.00
Food Producers	0.02	0.36	0.02	0.40	0.02	0.35	0.02	0.42	0.02	0.45	0.02	0.41
General Industries	0.04	0.10	0.04	0.11	0.04	0.10	0.04	0.11	0.04	0.11	0.04	0.11
Household Goods	-0.02	0.61	-0.02	0.58	-0.02	0.62	-0.01	0.66	-0.02	0.63	-0.01	0.66
Industrial Engineering	0.02	0.52	0.02	0.54	0.02	0.52	0.02	0.46	0.02	0.47	0.02	0.46
Oil and Gas	0.15	0.00	0.15	0.00	0.15	0.00	0.16	0.00	0.16	0.00	0.16	0.00
Personal Goods	0.03	0.16	0.03	0.19	0.03	0.16	0.03	0.16	0.03	0.17	0.03	0.16
Pharma and Bio Tech	0.04	0.19	0.04	0.19	0.04	0.19	0.04	0.15	0.04	0.15	0.04	0.15
Tobacco	0.04	0.23	0.04	0.25	0.04	0.23	0.03	0.33	0.03	0.35	0.03	0.33
Travel and Leisure	-0.01	0.74	-0.01	0.68	-0.01	0.73	-0.02	0.60	-0.02	0.57	-0.02	0.60
Adj. R	0.42		0.42		0.42		0.41		0.41		0.41	
F stat.	56.26		58.95		58.96		52.76		55.30		55.29	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.14a and 4.15a.

The above table 4.15b presents the results of industry fixed effect for model 7 to 12, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Fixed Line industry and Oil and Gas industry have a significantly different intercept values in model 7 to model 12. The Chemical industry has intercept value of 0.06 which means that average SPS for Chemical industry is higher than Automobile and parts industry. The Fixed Line industry has intercept values between “0.09 to 0.11”which means that average SPS is higher for Fixed Line industry than Automobile and parts industry. The Oil and Gas industry has intercept of “0.15 to 0.16” which means that average SPS is higher for Oil and Gas industry than Automobile and parts industry. The overall results of table 4.15b reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry and Oil and Gas industry. All other industries have statistically insignificant values, which mean there is no difference in SPS in comparison to Automobile and parts industry.

The results for model 13 to model 18 for pool dummy variable are presented in table 4.15c has the following econometric models:

Model 13

$$\begin{aligned}\mathrm{SYNCH}_{i,t} = {} & \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} \\ & + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{DR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}\end{aligned}$$

Model 14

$$\begin{aligned}\mathrm{SYNCH}_{i,t} = {} & \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} \\ & + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}\end{aligned}$$

Model 15

$$\begin{aligned}\mathrm{SYNCH}_{i,t} = {} & \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} \\ & + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}\end{aligned}$$

Model 16

$$\begin{aligned}\mathrm{SYNCH}_{i,t} = {} & \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} \\ & + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}\end{aligned}$$

Model 17

$$\begin{aligned}\mathrm{SYNCH}_{i,t} = {} & \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} \\ & + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}\end{aligned}$$

Model 18

$$\begin{aligned}\mathrm{SYNCH}_{i,t} = {} & \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} \\ & + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}\end{aligned}$$

Table 4.15c: Pool dummy regression with base industry of Automobile and Parts and SPS on information environment variables for the period of 2002 to 2012

	13		14		15		16		17		18	
	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.
Const.	0.52	0.07	0.35	0.23	0.61	0.03	1.02	0.00	0.91	0.00	1.07	0.00
Ins. Own.	-0.01	0.73	-0.04	0.08	-0.01	0.62	-0.01	0.58	-0.05	0.04	-0.02	0.48
Age	-0.02	0.09	-0.02	0.04	-0.02	0.08	-0.02	0.02	-0.03	0.01	-0.02	0.01
Trade cost	-0.03	0.00	-0.02	0.05	-0.03	0.00	-0.03	0.00	-0.02	0.03	-0.03	0.00
Size	0.03	0.00	0.04	0.00	0.03	0.00	0.03	0.00	0.04	0.00	0.03	0.00
BTM	-0.01	0.71	-0.03	0.47	-0.02	0.58	-0.01	0.82	-0.02	0.54	-0.02	0.67
Vol.												
Turn. rate	0.94	0.00	1.10	0.00	0.94	0.00	1.09	0.00	1.24	0.00	1.09	0.00
Value traded												
Illiq.	0.21	0.11	0.27	0.04			0.21	0.11	0.27	0.04		
Zero Vol.	-0.22	0.00			-0.22	0.00	-0.23	0.00			-0.23	0.00
Daily Ret.	-0.65	0.05	-0.42	0.22	-0.72	0.03						
Weekly Ret.												
Monthly Ret.							-1.38	0.00	-1.23	0.00	-1.39	0.00
Abs. Ret.												
Chemicals	0.11	0.00	0.09	0.00	0.11	0.00	0.10	0.00	0.09	0.00	0.10	0.00
Construction and Materials	0.06	0.01	0.04	0.15	0.06	0.01	0.05	0.03	0.03	0.25	0.05	0.03
Electricity	0.04	0.14	0.04	0.13	0.04	0.12	0.03	0.35	0.03	0.29	0.03	0.31
Fixed Line Telecommunication	0.14	0.00	0.13	0.00	0.14	0.00	0.13	0.00	0.11	0.00	0.13	0.00
Food Producers	0.01	0.81	-0.04	0.07	0.00	0.87	0.01	0.73	-0.04	0.07	0.01	0.79
General Industries	0.04	0.17	0.00	0.88	0.04	0.18	0.04	0.18	0.00	0.94	0.04	0.19
Household Goods	0.01	0.69	-0.01	0.87	0.01	0.72	0.01	0.84	-0.01	0.72	0.01	0.87
Industrial Engineering	0.00	0.98	-0.03	0.38	0.00	0.97	-0.01	0.83	-0.03	0.28	-0.01	0.82
Oil and Gas	0.22	0.00	0.20	0.00	0.22	0.00	0.21	0.00	0.19	0.00	0.21	0.00
Personal Goods	0.04	0.10	-0.01	0.54	0.04	0.09	0.03	0.12	-0.02	0.42	0.04	0.11
Pharma and Bio Tech	0.00	0.94	-0.02	0.53	0.00	0.94	-0.01	0.82	-0.02	0.43	-0.01	0.81
Tobacco	0.01	0.73	-0.04	0.25	0.01	0.72	0.03	0.48	-0.03	0.34	0.03	0.46
Travel and Leisure	-0.04	0.25	-0.12	0.00	-0.04	0.28	-0.05	0.20	-0.13	0.00	-0.04	0.22
Adj. R	0.32		0.29		0.32		0.34		0.30		0.34	
F stat.	37.53		33.20		39.16		40.64		35.65		42.41	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.14a and 4.15a.

The above table 4.15c presents the results of industry fixed effect analysis for model 13 to 18, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Fixed Line industry and Oil and Gas industry have a significantly different intercept values in model13 to model 18. While, Construction and Material industry has significantly different intercept value in model 13, 15, 16 and model 18, Personal Goods industry has different intercept values in model 15 and Travel and Leisure has also different intercept value in model 14 and model17 than Automobile and parts industry. The Chemical industry has intercept values between“0.09 to 0.11” which means that average SPS is higher for Chemical industry than Automobile and parts industry. The Fixed Line industry results are in lined with chemical industry results and have intercept value of “0.11 to 0.14”.The Oil and Gas industry results are also consistent with results of fixed line and chemical industry and have intercept values of “0.19 to 0.22”.The Construction and Material industry has intercept of “0.05 to 0.06”which means that average SPS is higher for Construction and Material industry than Automobile and parts industry. The Personal Goods industry has intercept values of 0.04 which means that average SPS is higher for Personal Goods industry than Automobile and parts industry. The Travel and Leisure has intercept values of “-0.12 to -0.13” which means that average SPS is lower for Travel and Leisure than Automobile and parts industry. The overall results of table 4.15c reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry and Oil and Gas industry and less in transportation industry. All other industries have statistically insignificant values, which mean there is no difference in average SPS of other industries in comparison to Automobile and parts industry.

The results for model 19 to model 24 for pool dummy variable are presented in table 4.15d has the following econometric models:

Model 19

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 20

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 21

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 22

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 23

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 24

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Table 4.15d: Pool dummy regression with base industry of Automobile and Parts and SPS on information environment variables for the period of 2002 to 2012

	19		20		21		22		23		24	
	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.
Const.	4.14	0.00	3.76	0.00	4.22	0.00	0.01	0.95	0.06	0.75	0.01	0.95
Ins. Own.	-0.01	0.57	-0.05	0.04	-0.02	0.47	-0.01	0.72	-0.04	0.07	-0.01	0.72
Age	-0.02	0.02	-0.03	0.01	-0.02	0.02	-0.02	0.11	-0.02	0.04	-0.02	0.11
Trade cost	-0.03	0.00	-0.02	0.04	-0.03	0.00	-0.03	0.00	-0.02	0.06	-0.03	0.00
Size	0.03	0.00	0.04	0.00	0.03	0.00	0.03	0.00	0.04	0.00	0.03	0.00
BTM	-0.01	0.83	-0.02	0.55	-0.02	0.68	-0.01	0.85	-0.03	0.47	-0.01	0.85
Vol.												
Turn. rate	1.09	0.00	1.24	0.00	1.09	0.00	0.93	0.00	1.10	0.00	0.93	0.00
Value traded												
Illiq.	0.20	0.11	0.26	0.04			0.00	1.00	0.28	0.07		
Zero Vol.	-0.23	0.00			-0.23	0.00	-0.24	0.00			-0.24	0.00
Daily Ret.												
Weekly Ret.	-5.88	0.00	-5.35	0.00	-5.94	0.00						
Monthly Ret.												
Abs. Ret.							0.46	0.00	0.03	0.87	0.46	0.00
Chemicals	0.11	0.00	0.09	0.00	0.11	0.00	0.11	0.00	0.09	0.00	0.11	0.00
Construction and Materials	0.06	0.02	0.03	0.17	0.06	0.02	0.06	0.02	0.04	0.15	0.06	0.02
Electricity	0.03	0.30	0.03	0.25	0.03	0.26	0.04	0.15	0.04	0.13	0.04	0.15
Fixed Line Telecommunicatio	0.13	0.00	0.11	0.00	0.13	0.00	0.14	0.00	0.13	0.00	0.14	0.00
Food Producers	0.01	0.71	-0.04	0.08	0.01	0.77	0.01	0.78	-0.04	0.07	0.01	0.78
General Industries	0.04	0.16	0.00	0.89	0.04	0.17	0.04	0.15	0.00	0.89	0.04	0.15
Household Goods	0.01	0.74	-0.01	0.81	0.01	0.77	0.01	0.69	-0.01	0.87	0.01	0.69
Industrial Engineering	0.00	0.91	-0.03	0.32	0.00	0.90	0.00	1.00	-0.03	0.38	0.00	1.00
Oil and Gas	0.21	0.00	0.19	0.00	0.21	0.00	0.21	0.00	0.20	0.00	0.21	0.00
Personal Goods	0.04	0.11	-0.02	0.46	0.04	0.10	0.04	0.12	-0.01	0.53	0.04	0.12
Pharma and Bio	-0.01	0.82	-0.02	0.42	-0.01	0.81	-0.01	0.87	-0.02	0.52	-0.01	0.87
Tobacco	0.03	0.48	-0.03	0.35	0.03	0.46	0.01	0.72	-0.04	0.29	0.01	0.72
Travel and Leisure	-0.04	0.25	-0.12	0.00	-0.04	0.28	-0.06	0.13	-0.12	0.00	-0.06	0.13
Adj. R	0.34		0.30		0.34		0.33		0.29		0.33	
F stat.	40.55		35.66		42.32		37.84		33.10		39.66	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.14a and 4.15a.

The above table 4.15d presents the results of pool dummy variable analysis for model 19 to model 24, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Fixed Line industry and Oil and Gas industry have a significantly different intercept values in model 19 to model 24, while Construction and Material industry has different intercept values in model 19, 21, 22 and model 24 and Food Producers industry and Travel and Leisure have different intercept values in model 20 and model 23.The Chemical industry has intercept value of "0.09 to 0.11" which means that average SPS is higher for Chemical industry than Automobile and parts industry. The Fixed Line industry has intercept of "0.11 to 0.14", Oil and Gas industry has intercept of "0.19 to 0.21"and Construction and Material industry has intercept of 0.06 which means that average SPS is higher for Fixed Line industry, Oil and Gas industry and Construction and Material industry than Automobile and parts industry. The Travel and Leisure has intercept of -0.12 which means that average SPS is lower for Travel and Leisure than Automobile and parts industry. The overall results of table 4.15d reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry and Oil and Gas industry, Construction and Material industry and less in transportation industry. All other industries have statistically insignificant values, which mean there is no difference in average SPS of other industries in comparison to Automobile and parts industry.

The results for model 25 to model 30 are presented in table 4.15e has the following econometric models:

Model 25

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{DR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 26

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 27

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 28

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 29

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Model 30

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

Table 4.15e: Pool dummy regression with base industry of Automobile and Parts and SPS on information environment variables for the period of 2002 to 2012

	25		26		27		28		29		30	
	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.
Const.	-0.09	0.76	-0.19	0.49	0.18	0.51	0.46	0.03	0.37	0.08	0.62	0.00
Ins. Own.	0.01	0.78	0.00	0.93	0.00	0.89	0.00	0.93	-0.01	0.75	-0.01	0.73
Age	-0.01	0.25	-0.01	0.22	-0.01	0.19	-0.02	0.07	-0.02	0.06	-0.02	0.05
Trade cost	-0.03	0.00	-0.03	0.00	-0.03	0.00	-0.03	0.00	-0.03	0.00	-0.03	0.00
Size	0.01	0.13	0.01	0.14	0.00	0.43	0.01	0.04	0.01	0.04	0.00	0.16
BTM	0.00	0.98	0.00	0.97	-0.02	0.63	0.01	0.87	0.00	0.94	-0.01	0.73
Vol.												
Turn. rate												
Value traded	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
Illiq.	0.52	0.00	0.57	0.00			0.51	0.00	0.56	0.00		
Zero Vol.	-0.07	0.00			-0.09	0.00	-0.09	0.00			-0.10	0.00
Daily Ret.	-0.48	0.13	-0.40	0.21	-0.65	0.04						
Weekly Ret.												
Monthly Ret.							-1.26	0.00	-1.20	0.00	-1.29	0.00
Abs. Ret.												
Chemicals	0.07	0.00	0.06	0.01	0.08	0.00	0.07	0.01	0.06	0.02	0.07	0.00
Construction and Materials	0.05	0.03	0.04	0.06	0.05	0.03	0.04	0.06	0.04	0.12	0.04	0.06
Electricity	0.03	0.32	0.03	0.33	0.03	0.22	0.01	0.62	0.01	0.63	0.02	0.47
Fixed Line Telecommunication	0.14	0.00	0.13	0.00	0.14	0.00	0.12	0.00	0.12	0.00	0.12	0.00
Food Producers	0.02	0.28	0.01	0.56	0.02	0.40	0.03	0.23	0.01	0.55	0.02	0.35
General Industries	0.04	0.17	0.03	0.30	0.03	0.20	0.03	0.17	0.02	0.34	0.03	0.21
Household Goods	-0.01	0.87	-0.01	0.70	-0.01	0.83	-0.01	0.73	-0.02	0.55	-0.01	0.68
Industrial Engineering	0.00	0.87	0.00	0.94	0.00	0.91	0.00	0.98	-0.01	0.77	0.00	0.94
Oil and Gas	0.16	0.00	0.15	0.00	0.17	0.00	0.15	0.00	0.14	0.00	0.16	0.00
Personal Goods	0.04	0.04	0.03	0.15	0.05	0.03	0.04	0.05	0.03	0.20	0.04	0.04
Pharma and Bio Tech	0.03	0.34	0.03	0.38	0.02	0.39	0.02	0.43	0.02	0.47	0.02	0.48
Tobacco	0.04	0.26	0.03	0.44	0.04	0.26	0.05	0.15	0.03	0.32	0.05	0.14
Travel and Leisure	0.00	0.97	-0.02	0.66	0.01	0.86	0.00	0.95	-0.02	0.55	0.00	0.96
Adj. R	0.40		0.40		0.39		0.41		0.41		0.41	
F stat.	48.52		50.05		49.45		51.72		53.12		52.77	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.14a and 4.15a.

The above table 4.15e presents the results of industry fixed effect analysis for model 25 to model 30, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Fixed Line industry and Oil and Gas industry have a significantly different intercept values in model 25 to model 30, while Construction and Material industry has a significantly different intercept values in model 25 to 30 except 29 and Personal Goods industry has a significantly different intercept in model 25, 27, 28 and 30. The Chemical industry has intercept of "0.06 to 0.08", Fixed Line industry has intercept of "0.12 to 0.14", Oil and Gas industry has intercept of "0.14 to 0.17", Personal Goods industry has intercept of "0.04 to 0.05" which means that average SPS is higher for Chemical industry, Fixed Line industry and Oil and Gas industry and Personal Goods industry than Automobile and parts industry. The overall results of table 4.15e reflect that firm specific variables can explain more variations in auto part industry than Chemical industry, Fixed Line industry and Oil and Gas industry and Personal Goods industry. All other industries have statistically insignificant values, which mean there is no difference in average SPS of other industries in comparison to Automobile and parts industry.

The results for model 31 to model 36 for pool dummy variable are presented in table 4.15fhas the following econometric models:

Model 31

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 32

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 33

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 34

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 35

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 36

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.15f: Industry pool dummy regression with base industry of Automobile and Parts and SPS on information environment variables for the period of 2002 to 2012

	31 Coef	Prob.	32 Coef	Prob.	33 Coef	Prob.	34 Coef	Prob.	35 Coef	Prob.	36 Coef	Prob.
Const.	3.36	0.00	3.16	0.00	3.61	0.00	-0.43	0.01	-0.47	0.01	-0.37	0.02
Ins. Own.	0.00	0.94	-0.01	0.75	-0.01	0.72	0.01	0.80	0.00	0.91	0.00	0.99
Age	-0.02	0.07	-0.02	0.06	-0.02	0.05	-0.01	0.27	-0.01	0.24	-0.01	0.25
Trade cost	-0.03	0.00	-0.03	0.00	-0.03	0.00	-0.03	0.00	-0.03	0.00	-0.03	0.00
Size	0.01	0.05	0.01	0.05	0.00	0.21	0.01	0.09	0.01	0.15	0.01	0.10
BTM	0.01	0.86	0.00	0.92	-0.01	0.74	0.00	0.93	0.00	0.97	0.00	0.91
Vol.												
Turn. rate												
Value traded	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00
Illiq.	0.51	0.00	0.56	0.00			0.45	0.00	0.57	0.00		
Zero Vol.	-0.08	0.00			-0.09	0.00	-0.08	0.00			-0.10	0.00
Daily Ret.												
Weekly Ret.	-5.45	0.00	-5.24	0.00	-5.60	0.00						
Monthly Ret.												
Abs. Ret.							0.18	0.23	0.03	0.81	0.43	0.00
Chemicals	0.07	0.00	0.06	0.01	0.07	0.00	0.07	0.00	0.06	0.01	0.08	0.00
Construction and Materials	0.05	0.03	0.04	0.08	0.05	0.03	0.05	0.03	0.04	0.06	0.05	0.03
Electricity	0.02	0.56	0.01	0.57	0.02	0.42	0.03	0.32	0.03	0.33	0.03	0.26
Fixed Line Telecommunication	0.12	0.00	0.12	0.00	0.12	0.00	0.13	0.00	0.13	0.00	0.13	0.00
Food Producers	0.03	0.22	0.01	0.52	0.02	0.33	0.02	0.28	0.01	0.57	0.02	0.33
General Industries	0.04	0.15	0.03	0.30	0.03	0.19	0.04	0.16	0.03	0.31	0.04	0.17
Household Goods	-0.01	0.82	-0.02	0.64	-0.01	0.78	-0.01	0.87	-0.01	0.70	-0.01	0.86
Industrial Engineering	0.00	0.94	-0.01	0.85	0.00	0.98	0.00	0.86	0.00	0.95	0.00	0.88
Oil and Gas	0.16	0.00	0.14	0.00	0.16	0.00	0.16	0.00	0.15	0.00	0.16	0.00
Personal Goods	0.04	0.04	0.03	0.18	0.04	0.03	0.04	0.04	0.03	0.15	0.04	0.04
Pharma and Bio Tech	0.02	0.43	0.02	0.48	0.02	0.48	0.03	0.37	0.03	0.38	0.02	0.44
Tobacco	0.05	0.15	0.03	0.31	0.05	0.14	0.04	0.24	0.03	0.39	0.04	0.27
Travel and Leisure	0.00	0.94	-0.02	0.65	0.01	0.85	-0.01	0.88	-0.02	0.61	-0.01	0.80
Adj. R	0.41		0.41		0.41		0.40		0.39		0.39	
F stat.	51.72		53.16		52.77		48.46		49.94		50.01	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.14a and 4.15a.

The above table 4.15f presents the results of pool dummy variable analysis for model 31 to model 36, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Fixed Line industry, Oil and Gas industry and Construction and Material industry have a significantly different intercept in model 31 to model 36, while, Personal Goods industry has different intercept in model 31, 33, 34 and model 36.The Chemical industry has intercept values of “0.06 to 0.08”, Fixed Line industry has intercept values of “0.12 to 0.13”, Oil and Gas industry has intercept values of “0.14 to 0.16”, Construction and Material industry has intercept values of “0.04 to 0.05” and Personal Goods industry has intercept values of “0.04 to 0.05”which means that average SPS is higher for Chemical industry, Fixed Line industry and Oil and Gas industry, Construction and Material industry and Personal Goods industry than Automobile and parts industry.

The overall results of table 4.15f reflect that firm specific variables can explain more variations in auto part industry than Chemical industry, Fixed Line industry and Oil and Gas industry, Construction and Material industry and Personal Goods industry. All other industries have statistically insignificant values, which mean there is no difference in average SPS of other industries in comparison to Automobile and parts industry.

The overall results of table 4.15 reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry, Oil and Gas industry and Construction and Material industry. All other industries have statistically insignificant values, which mean there is no difference in SPS in comparison to Automobile and parts industry.

4.2.5.3 Pool dummy regression of SPS on information environment variables for R-square sorted portfolios

The results for model 1 to model 6 for pool dummy variable analysis on the basis of R-square sorted decile portfolios starting from portfolio 1 having low R-square to portfolio 10 high R-square are presented in table 4.16a have the following econometric models:

Model 1

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{DR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 2

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 3

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 4

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 5

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 6

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Table 4.16a: Pool dummy regression with base of Lowest R-square portfolio and SPS on information environment variables for the period of 2002 to 2012

	1		2		3		4		5		6	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Const.	-1.58	0.68	-2.38	0.53	-1.38	0.72	-0.77	0.81	-1.28	0.69	-0.08	0.98
Ins. Own.	0.19	0.37	0.16	0.43	0.19	0.35	0.19	0.33	0.13	0.50	0.20	0.31
Age	-0.12	0.10	-0.10	0.14	-0.12	0.08	-0.20	0.01	-0.16	0.02	-0.20	0.00
Trade cost	0.01	0.81	0.01	0.65	0.01	0.81	0.01	0.63	0.02	0.41	0.01	0.64
Size	-0.01	0.69	-0.01	0.77	-0.01	0.76	-0.02	0.21	-0.02	0.42	-0.02	0.30
BTM	0.84	0.27	0.81	0.29	0.73	0.32	0.86	0.22	0.79	0.27	0.67	0.32
Vol.	-0.01	0.44	0.00	0.68	-0.01	0.52	-0.01	0.51	0.00	0.94	0.00	0.71
Turn. rate												
Value traded												
Illiq.	-0.59	0.57	-0.38	0.71			-0.97	0.30	-0.65	0.50		
Zero Vol.	-0.15	0.24			-0.13	0.28	-0.27	0.02			-0.25	0.03
Daily Ret.	-2.38	0.36	-1.27	0.60	-2.01	0.42						
Weekly Ret.												
Monthly Ret.							-3.11	0.00	-2.44	0.00	-2.98	0.00
Abs. Ret.												
Port. 2	0.01	0.85	0.00	0.92	0.01	0.89	0.01	0.85	0.00	0.93	0.00	0.90
Port. 3	0.00	1.00	0.00	0.95	0.00	0.98	0.00	0.96	0.00	0.96	0.00	0.98
Port. 4	0.02	0.68	0.02	0.63	0.02	0.70	0.01	0.77	0.02	0.67	0.01	0.81
Port. 5	0.04	0.38	0.04	0.30	0.04	0.40	0.02	0.59	0.04	0.35	0.02	0.63
Port. 6	0.04	0.36	0.06	0.21	0.05	0.32	0.02	0.65	0.05	0.27	0.03	0.55
Port. 7	0.10	0.05	0.12	0.01	0.10	0.04	0.07	0.12	0.11	0.02	0.07	0.12
Port. 8	0.14	0.01	0.17	0.00	0.14	0.01	0.09	0.07	0.15	0.00	0.09	0.07
Port. 9	0.24	0.00	0.27	0.00	0.24	0.00	0.20	0.00	0.25	0.00	0.20	0.00
Port. 10	0.56	0.00	0.59	0.00	0.56	0.00	0.52	0.00	0.58	0.00	0.52	0.00
Adj. R	0.75		0.75		0.75		0.79		0.78		0.79	
F stat.	19.34		20.31		20.61		23.35		23.24		24.65	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note:
** All the firm specific variables are the same as defined in table 4.14a.*
***Port. Stands for portfolio, Port. 1 Low R-square portfolio is used as reference portfolio and Port. 2 is portfolio of company's average R-square higher than Port.1, Port. 3 is portfolio of company's average R-square higher than Port.2, Port. 4 is portfolio of company's average R-square higher than Port.3, Port. 5 is portfolio of company's average R-square higher than Port.4, Port. 6 is portfolio of company's average R-square higher than Port.5, Port. 7 is portfolio of company's average R-square higher than Port.6, Port. 8 is portfolio of company's average R-square higher than Port.7, Port. 9 is portfolio of company's average R-square higher than Port.8 and Port. 10 is portfolio of company's average R-square higher than Port.9.*

The above table4.16a presents the results of pool dummy variable analysis for model 1 to 6, where Low R-square portfolios used as reference portfolio. The result shows that portfolio 9 and portfolio 10 have significant different intercepts in model 1 to model 6. While, portfolio 7 has a significantly different intercept values in model 1, 2, 3 and model 5 and portfolio 8 has significantly different intercept values model 1, 2, 3 and model 5. The portfolio 7 has intercept values of “0.10 to 0.12”, portfolio 8 has intercept values between “0.14 to 0.17”, portfolio 9 has intercept values between “0.20 to 0.27” and portfolio 10 has intercept values between “0.52 to 0.59” which means that average SPS is higher for portfolio 7, portfolio 8portfolio 9 and portfolio 10 than portfolio 1. All other R-square sorted portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1. The overall results of table 4.16a reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8portfolio 9 and portfolio 10.

The results for model 7 to model 12 for pool dummy variable analysis on the basis of R-square sorted decile portfolios starting from portfolio 1 having low R-square to portfolio 10 high R-square are presented in table4.16b have the following econometric models:

Model 7

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 8

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 9

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 10

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 11

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 12

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Table 4.16b: Pool dummy regression with base of Lowest R-square portfolio and SPS on information environment variables for the period of 2002 to 2012

	7		8		9		10		11		12	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Const.	7.05	0.08	4.91	0.22	7.46	0.06	-4.13	0.22	-3.77	0.26	-3.02	0.35
Ins. Own.	0.19	0.33	0.13	0.52	0.19	0.32	0.19	0.37	0.15	0.46	0.20	0.34
Age	-0.20	0.00	-0.16	0.02	-0.21	0.00	-0.11	0.11	-0.10	0.15	-0.12	0.08
Trade cost	0.02	0.59	0.03	0.38	0.02	0.61	0.01	0.86	0.01	0.65	0.01	0.84
Size	-0.03	0.18	-0.02	0.38	-0.02	0.25	0.00	0.88	0.00	0.91	0.00	0.93
BTM	0.82	0.24	0.76	0.29	0.64	0.34	1.02	0.18	0.90	0.23	0.76	0.29
Vol.	-0.01	0.55	0.00	0.89	0.00	0.75	-0.01	0.34	0.00	0.66	-0.01	0.53
Turn. rate												
Value traded												
Illiq.	-0.91	0.33	-0.60	0.52			-1.32	0.26	-0.79	0.48		
Zero Vol.	-0.28	0.02			-0.26	0.02	-0.19	0.14			-0.14	0.24
Daily Ret.												
Weekly Ret.	-14.11	0.00	-11.15	0.00	-13.63	0.00						
Monthly Ret.												
Abs. Ret.							1.61	0.13	0.93	0.34	0.96	0.28
Port. 2	0.01	0.84	0.00	0.92	0.01	0.89	0.01	0.86	0.00	0.93	0.00	0.94
Port. 3	0.00	0.97	0.00	0.95	0.00	0.99	0.01	0.87	0.01	0.87	0.01	0.89
Port. 4	0.01	0.78	0.02	0.68	0.01	0.83	0.02	0.63	0.02	0.60	0.02	0.69
Port. 5	0.02	0.63	0.04	0.37	0.02	0.68	0.05	0.24	0.05	0.22	0.04	0.33
Port. 6	0.02	0.66	0.05	0.27	0.02	0.57	0.06	0.22	0.07	0.15	0.06	0.21
Port. 7	0.07	0.12	0.11	0.02	0.07	0.12	0.12	0.02	0.14	0.01	0.12	0.02
Port. 8	0.09	0.07	0.15	0.00	0.09	0.07	0.16	0.00	0.18	0.00	0.16	0.00
Port. 9	0.20	0.00	0.25	0.00	0.20	0.00	0.26	0.00	0.28	0.00	0.26	0.00
Port. 10	0.52	0.00	0.58	0.00	0.52	0.00	0.58	0.00	0.60	0.00	0.57	0.00
Adj. R	0.79		0.78		0.79		0.76		0.75		0.75	
F stat.	23.79		23.58		25.14		19.73		20.50		20.75	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: 1) All the firm specific variables are the same as defined in table 4.14a and table 4.16a.

The above table4.16b presents the results of pool dummy variable analysis for model 7 to 12, where Low R-square portfolio is used as portfolio industry. The results show that portfolio 9 and portfolio 10 have significant different intercept values in model 7 to model 12. While, portfolio 7 and portfolio 8 has a significantly different intercept values in model 8, model10, model11 and model 12. The portfolio 7 has intercept values of "0.11 to 0.14", portfolio 8 has intercept values between "0.15 to 0.18", portfolio 9 has intercept values between "0.20 to 0.28" and portfolio 10 has intercept values between “0.52 to 0.60” which means that average SPS is higher for portfolio 7, portfolio 8, portfolio 9 and portfolio 10 than portfolio 1. All other R-square sorted average portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1. The overall results of table 4.16b reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8portfolio 9 and portfolio 10.

The results for model 13 to model 18 for pool dummy variable analysis on the basis of R-square decile portfolios starting from portfolio 1 having low R-square to portfolio 10 high R-square are presented in table4.16c have the following econometric models:

Model 13

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2\ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4\ln(\mathrm{Size})_{it} + \beta_5\ln(\mathrm{BTM})_{it} + \beta_6\ln(\mathrm{Turnover\ rate})_{it} + \beta_7\ln(\mathrm{ill})_{it} + \beta_8\ln(\%\mathrm{zero})_{it} + \beta_9\ln(\mathrm{DR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 14

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2\ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4\ln(\mathrm{Size})_{it} + \beta_5\ln(\mathrm{BTM})_{it} + \beta_6\ln(\mathrm{Turnover\ rate})_{it} + \beta_7\ln(\mathrm{ill})_{it} + \beta_8\ln(\mathrm{DR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 15

$$\alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2\ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4\ln(\mathrm{Size})_{it} + \beta_5\ln(\mathrm{BTM})_{it} + \beta_6\ln(\mathrm{Turnover\ rate})_{it} + \beta_7\ln(\%\mathrm{zero})_{it} + \beta_8\ln(\mathrm{DR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 16

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2\ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4\ln(\mathrm{Size})_{it} + \beta_5\ln(\mathrm{BTM})_{it} + \beta_6\ln(\mathrm{Turnover\ rate})_{it} + \beta_7\ln(\mathrm{ill})_{it} + \beta_8\ln(\%\mathrm{zero})_{it} + \beta_9\ln(\mathrm{MR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 17

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2\ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4\ln(\mathrm{Size})_{it} + \beta_5\ln(\mathrm{BTM})_{it} + \beta_6\ln(\mathrm{Turnover\ rate})_{it} + \beta_7\ln(\mathrm{ill})_{it} + \beta_8\ln(\mathrm{MR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 18

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2\ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4\ln(\mathrm{Size})_{it} + \beta_5\ln(\mathrm{BTM})_{it} + \beta_6\ln(\mathrm{Turnover\ rate})_{it} + \beta_7\ln(\%\mathrm{zero})_{it} + \beta_8\ln(\mathrm{MR})_{it} + \sum R^2PD_{it} + \delta_{it}$$

Table 4.16c: Pool dummy regression with base of Lowest R-square portfolio and SPS on information environment variables for the period of 2002 to 2012

	13		14		15		16		17		18	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Const.	-1.38	0.72	-2.26	0.55	-1.26	0.74	-0.65	0.84	-1.28	0.69	-0.09	0.98
Ins. Own.	0.20	0.35	0.17	0.41	0.20	0.33	0.18	0.36	0.13	0.52	0.19	0.33
Age	-0.13	0.08	-0.12	0.11	-0.14	0.06	-0.19	0.01	-0.16	0.03	-0.20	0.00
Trade cost	0.01	0.63	0.02	0.55	0.01	0.65	0.02	0.52	0.02	0.42	0.02	0.57
Size	-0.01	0.53	-0.01	0.68	-0.01	0.58	-0.03	0.16	-0.01	0.41	-0.02	0.22
BTM	0.79	0.30	0.78	0.30	0.72	0.32	0.82	0.24	0.80	0.26	0.67	0.32
Vol.												
Turn. rate	-1.20	0.32	-0.93	0.43	-1.19	0.32	-0.01	0.99	0.23	0.85	-0.05	0.96
Value traded												
Illiq.	-0.36	0.72	-0.26	0.79	-0.13	0.26	-0.78	0.38	-0.67	0.46		
Zero Vol.	-0.14	0.25					-0.25	0.03			-0.24	0.03
Daily Ret.	-2.37	0.36	-1.26	0.60	-2.13	0.39						
Weekly Ret.												
Monthly Ret.							-3.13	0.00	-2.48	0.00	-3.00	0.00
Abs. Ret.												
Port. 2	0.00	0.93	0.00	0.96	0.00	0.94	0.00	0.92	0.00	0.92	0.00	0.93
Port. 3	0.00	0.96	0.00	0.97	0.00	0.97	0.00	0.94	0.00	0.96	0.00	0.97
Port. 4	0.01	0.78	0.02	0.69	0.01	0.78	0.01	0.83	0.02	0.65	0.01	0.85
Port. 5	0.03	0.43	0.04	0.32	0.03	0.44	0.02	0.63	0.04	0.34	0.02	0.66
Port. 6	0.03	0.48	0.05	0.25	0.04	0.43	0.02	0.71	0.05	0.25	0.02	0.59
Port. 7	0.09	0.06	0.12	0.01	0.09	0.05	0.07	0.15	0.11	0.01	0.07	0.13
Port. 8	0.13	0.02	0.16	0.00	0.13	0.02	0.09	0.09	0.15	0.00	0.09	0.08
Port. 9	0.23	0.00	0.26	0.00	0.23	0.00	0.19	0.00	0.25	0.00	0.19	0.00
Port. 10	0.54	0.00	0.58	0.00	0.54	0.00	0.51	0.00	0.58	0.00	0.51	0.00
Adj. R	0.75		0.75		0.76		0.79		0.78		0.79	
F stat.	19.45		20.44		20.78		23.22		23.25		24.60	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: 1) All the firm specific variables are the same as defined in table 4.14a and table 4.16a.

The above table4.16b presents the results of pool dummy variable analysis for model 13 to 18, where Low R-square portfolio is used as reference portfolio. The result shows that portfolio 8, portfolio 9 and portfolio 10 have significant different intercept values in model 13 to model 18. While, portfolio 7 has a significantly different intercept values in model 13, model 14, model 15 and model 17. The portfolio 7 has intercept values of "0.09 to 0.11", portfolio 8 has intercept values between "0.09 to 0.16", portfolio 9 has intercept values between "0.19 to 0.26" and portfolio 10 has intercept values between "0.51 to 0.58" which means that average SPS is higher for portfolio 7, portfolio 8 portfolio 9 and portfolio 10 than portfolio 1.All other R-square sorted average portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1.The overall results of table 4.16c reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8, portfolio 9 and portfolio 10.

The results for model 19 to model 24 for pool dummy variable analysis on the basis of R-square decile portfolios starting from portfolio 1 having low R-square to portfolio 10 high R-square are presented in table4.16d have the following econometric models:

Model 19

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{WR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 20

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 21

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 22

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 23

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 24

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Turnover\ rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Table 4.16d: Pool dummy regression with base of Lowest R-square portfolio and SPS on information environment variables for the period of 2002 to 2012

	19		20		21		22		23		24	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Const.	7.26	0.07	5.01	0.21	7.53	0.06	-3.88	0.25	-3.65	0.28	-2.99	0.35
Ins. Own.	0.17	0.36	0.12	0.53	0.18	0.34	0.19	0.35	0.16	0.43	0.21	0.31
Age	-0.19	0.01	-0.16	0.02	-0.20	0.00	-0.12	0.09	-0.11	0.12	-0.14	0.06
Trade cost	0.02	0.49	0.03	0.40	0.02	0.54	0.01	0.65	0.02	0.55	0.01	0.69
Size	-0.03	0.13	-0.02	0.37	-0.02	0.18	-0.01	0.68	0.00	0.82	-0.01	0.78
BTM	0.78	0.26	0.77	0.28	0.64	0.34	0.95	0.21	0.88	0.24	0.76	0.29
Vol.												
Turn. rate	0.05	0.96	0.30	0.80	0.02	0.99	-1.35	0.26	-0.97	0.41	-1.29	0.28
Value traded												
Illiq.	-0.75	0.40	-0.65	0.48			-1.03	0.36	-0.68	0.54		
Zero Vol.	-0.26	0.02			-0.25	0.02	-0.17	0.15			-0.15	0.21
Daily Ret.												
Weekly Ret.	-14.27	0.00	-11.34	0.00	-13.76	0.00						
Monthly Ret.												
Abs. Ret.							1.60	0.13	0.95	0.33	1.07	0.23
Port. 2	0.00	0.90	0.00	0.91	0.00	0.91	0.00	0.96	0.00	0.97	0.00	0.99
Port. 3	0.00	0.96	0.00	0.94	0.00	0.98	0.00	0.92	0.01	0.90	0.00	0.93
Port. 4	0.01	0.85	0.02	0.66	0.01	0.86	0.01	0.74	0.02	0.65	0.01	0.77
Port. 5	0.02	0.68	0.04	0.35	0.02	0.70	0.05	0.28	0.05	0.24	0.04	0.35
Port. 6	0.02	0.72	0.05	0.24	0.02	0.61	0.05	0.32	0.06	0.17	0.05	0.28
Port. 7	0.07	0.15	0.11	0.01	0.07	0.12	0.11	0.03	0.13	0.01	0.11	0.03
Port. 8	0.09	0.09	0.15	0.00	0.09	0.07	0.14	0.01	0.17	0.00	0.14	0.01
Port. 9	0.19	0.00	0.25	0.00	0.19	0.00	0.25	0.00	0.28	0.00	0.25	0.00
Port. 10	0.51	0.00	0.58	0.00	0.51	0.00	0.56	0.00	0.60	0.00	0.55	0.00
Adj. R	0.79		0.78		0.79		0.76		0.75		0.76	
F stat.	23.67		23.59		25.10		19.83		20.64		20.98	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: 1) All the firm specific variables are the same as defined in table 4.14a and table 4.16a.

The above table4.16d presents the results of pool dummy variable analysis for model 19 to 24, where Low R-square portfolio is used as reference portfolio. The result shows that portfolio 8, portfolio 9 and portfolio 10 have significant different intercept values in model 19 to model 24. While, portfolio 7 has a significantly different intercept values in model 20, 22, 23, and model 24. The portfolio 7 has intercept values of “0.11 to 0.13”, portfolio 8 has intercept values between “0.09 to 0.17”, portfolio 9 has intercept values between “0.19 to 0.28” and portfolio 10 has intercept values between “0.51 to 0.60” which means that average SPS is higher for portfolio 7, portfolio 8 portfolio 9 and portfolio 10 than portfolio 1.All other R-square sorted average portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1.The overall results of table 4.16d reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8 portfolio 9 and portfolio 10.

The results for model 25 to model 30 for pool dummy variable analysis on the basis of R-square decile portfolios starting from portfolio 1 having low R-square to portfolio 10 high R-square are presented in table4.16e have the following econometric models:

Model 25

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{DR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 26

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 27

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{DR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 28

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 29

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Model 30

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

Table 4.16e: Pool dummy regression with base of Lowest R-square portfolio and SPS on information environment variables for the period of 2002 to 2012

	25		26		27		28		29		30	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Const.	-1.88	0.63	-2.66	0.49	-1.55	0.69	-0.82	0.80	-1.30	0.69	-0.09	0.98
Ins. Own.	0.22	0.30	0.19	0.37	0.22	0.30	0.20	0.31	0.13	0.51	0.20	0.32
Age	-0.13	0.08	-0.11	0.12	-0.13	0.07	-0.19	0.01	-0.16	0.02	-0.20	0.00
Trade cost	0.01	0.81	0.01	0.67	0.01	0.81	0.02	0.59	0.02	0.42	0.02	0.60
Size	-0.01	0.74	0.00	0.85	0.00	0.82	-0.02	0.22	-0.01	0.44	-0.02	0.28
BTM	0.87	0.25	0.84	0.27	0.73	0.32	0.86	0.22	0.80	0.27	0.67	0.32
Vol.												
Turn. rate												
Value traded	-0.01	0.28	-0.01	0.45	-0.01	0.39	-0.01	0.57	0.00	0.99	0.00	0.86
Illiq.	-0.80	0.46	-0.56	0.60			-1.01	0.30	-0.66	0.51		
Zero Vol.	-0.15	0.22			-0.13	0.27	-0.26	0.02			-0.25	0.03
Daily Ret.	-2.09	0.42	-1.01	0.68	-1.71	0.50						
Weekly Ret.												
Monthly Ret.							-3.06	0.00	-2.43	0.00	-2.97	0.00
Abs. Ret.												
Port. 2	0.01	0.78	0.01	0.86	0.01	0.85	0.01	0.84	0.00	0.93	0.00	0.91
Port. 3	0.00	0.99	0.00	0.93	0.00	0.97	0.00	0.96	0.00	0.96	0.00	0.97
Port. 4	0.02	0.67	0.02	0.61	0.02	0.70	0.01	0.78	0.02	0.66	0.01	0.84
Port. 5	0.04	0.35	0.05	0.27	0.04	0.38	0.02	0.58	0.04	0.34	0.02	0.64
Port. 6	0.04	0.38	0.06	0.20	0.05	0.31	0.02	0.68	0.05	0.26	0.02	0.58
Port. 7	0.10	0.04	0.12	0.01	0.10	0.04	0.07	0.13	0.11	0.01	0.07	0.13
Port. 8	0.14	0.01	0.17	0.00	0.14	0.01	0.09	0.08	0.15	0.00	0.09	0.07
Port. 9	0.24	0.00	0.27	0.00	0.24	0.00	0.20	0.00	0.25	0.00	0.19	0.00
Port. 10	0.57	0.00	0.60	0.00	0.56	0.00	0.52	0.00	0.58	0.00	0.51	0.00
Adj. R	0.75		0.75		0.75		0.79		0.78		0.79	
F stat.	19.49		20.43		20.70		23.32		23.24		24.61	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: 1) All the firm specific variables are the same as defined in table 4.14a and table 4.16a.

The above table4.16e presents the results of pool dummy variable analysis for model 25 to 30, where Low R-square portfolio is used as reference portfolio. The result shows that portfolio 8, portfolio 9 and portfolio 10 have significant different intercept values in model 25 to model 30. While, portfolio 7 has a significantly different intercept values in model 25, model 26, model 27 and model 29. The portfolio 7 has intercept values of "0.10 to 0.12", portfolio 8 has intercept values between "0.09 to 0.15", portfolio 9 has intercept values between "0.19 to 0.27" and portfolio 10 has intercept values between "0.51 to 0.60" which means that average SPS is higher for portfolio 7, portfolio 8 portfolio 9 and portfolio 10 than portfolio 1. All other R-square sorted portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1. The overall results of table 4.16e reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8 portfolio 9 and portfolio 10.

The results for model 31 to model 36 for pool dummy variable analysis on the basis of R-square decile portfolios starting from portfolio 1 having low R-square to portfolio 10 high R-square are presented in table4.16f have the following econometric models:

Model 31

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 32

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 33

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 34

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 35

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 36

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Table 4.16f: Pool dummy regression with base of Lowest R-square portfolio and SPS on information environment variables for the period of 2002 to 2012

	31		32		33		34		35		36	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Const.	6.90	0.09	4.90	0.22	7.46	0.06	-4.27	0.20	-3.86	0.25	-2.94	0.36
Ins. Own.	0.20	0.31	0.13	0.53	0.19	0.33	0.23	0.28	0.18	0.40	0.22	0.29
Age	-0.20	0.00	-0.16	0.02	-0.20	0.00	-0.12	0.08	-0.11	0.13	-0.13	0.07
Trade cost	0.02	0.55	0.03	0.39	0.02	0.57	0.00	0.87	0.01	0.67	0.01	0.85
Size	-0.03	0.18	-0.02	0.39	-0.02	0.23	0.00	0.96	0.00	1.00	0.00	0.99
BTM	0.82	0.24	0.76	0.29	0.64	0.34	1.07	0.16	0.94	0.22	0.76	0.30
Vol.												
Turn. rate												
Value traded	0.00	0.61	0.00	0.93	0.00	0.90	-0.01	0.18	-0.01	0.40	-0.01	0.39
Illiq.	-0.94	0.33	-0.61	0.54			-1.65	0.18	-1.01	0.39		
Zero Vol.	-0.27	0.02			-0.25	0.02	-0.20	0.11			-0.15	0.22
Daily Ret.												
Weekly Ret.	-13.91	0.00	-11.15	0.00	-13.64	0.00						
Monthly Ret.												
Abs. Ret.							1.66	0.12	0.92	0.34	0.90	0.32
Port. 2	0.01	0.83	0.00	0.92	0.00	0.90	0.01	0.76	0.01	0.86	0.01	0.89
Port. 3	0.00	0.97	0.00	0.95	0.00	0.98	0.01	0.86	0.01	0.85	0.01	0.88
Port. 4	0.01	0.80	0.02	0.67	0.01	0.85	0.02	0.61	0.02	0.57	0.02	0.69
Port. 5	0.02	0.63	0.04	0.37	0.02	0.69	0.06	0.21	0.06	0.20	0.04	0.32
Port. 6	0.02	0.69	0.05	0.26	0.02	0.60	0.06	0.23	0.07	0.13	0.06	0.21
Port. 7	0.07	0.13	0.11	0.01	0.07	0.12	0.12	0.02	0.14	0.00	0.11	0.02
Port. 8	0.09	0.08	0.15	0.00	0.09	0.07	0.16	0.00	0.19	0.00	0.15	0.00
Port. 9	0.19	0.00	0.25	0.00	0.19	0.00	0.27	0.00	0.29	0.00	0.26	0.00
Port. 10	0.52	0.00	0.58	0.00	0.51	0.00	0.59	0.00	0.62	0.00	0.58	0.00
Adj. R	0.79		0.78		0.79		0.76		0.75		0.76	
F stat.	23.75		23.58		25.11		19.98		20.64		20.86	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: 1) All the firm specific variables are the same as defined in table 4.14a and table 4.16a.

The above table4.16f presents the results of pool dummy variable analysis for model 31 to 36, where Low R-square portfolio is used as reference portfolio. The result shows that portfolio 8, portfolio 9 and portfolio 10 have significant different intercept values in model 31 to model 36. While, portfolio 7 has a significantly different intercept values in model 32, 34, 35 and model 36. The portfolio 7 has intercept values of "0.11 to 0.14", portfolio 8 has intercept values between "0.09 to 0.16", portfolio 9 has intercept values between "0.19 to 0.27" and portfolio 10 has intercept values between "0.51 to 0.62" which means that average SPS is higher for portfolio 7, portfolio 8 portfolio 9 and portfolio 10 than portfolio 1. All other R-square sorted portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1. The overall results of table 4.16f reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8 portfolio 9 and portfolio 10.

Table 4.16 presents the results of pool dummy variable analysis, where portfolio 1 (lowest R square stocks portfolio) is used as reference portfolio. The result shows that portfolio 7, portfolio 8, portfolio 9 and portfolio 10 have a significantly different intercept value. The overall results reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8, portfolio 9 and portfolio 10 or there is more noise in portfolio 1 stocks than portfolio 7, portfolio 8, portfolio 9 and portfolio 10. All other portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1.

4.2.5.4 Time series cross-sectional regression of SPS on information environment variables for portfolios 1 to portfolio 5

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.24, 0.26 and 0.42 respectively for model 1. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 1. So, this model for each portfolio explains a significant portion of SPS in model 1. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 2 and portfolio 4,size is statistically significant and negative for portfolio 3 and portfolio 4,value traded is statistically significant and positive for portfolio 3 at 90% confidence level and percentage of zero volume days are statistically significant and negative for portfolio 1 to portfolio 4. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.15, 0.26, 0.21, 0.24 and 0.38 respectively for model 2. These adjusted R squares indicate that information environment variables have 14% to 38% explanatory power for model 2. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4,trading cost is statistically significant and positive for portfolio 5, size is statistically significant and positive for portfolio 5 and negative for portfolio 4, volume is statistically significant and positive for portfolio 3 and portfolio 5, value traded is statistically significant and positive for portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4 at 95% confidence level and for portfolio 2 and portfolio 5 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.10, 0.25, 0.18, 0.22 and 0.38 respectively for model 3. These adjusted R squares indicate that information environment variables have 10% to 38% explanatory power for model 3. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 3, trading cost is statistically significant and positive for portfolio 3 and portfolio 4, size is statistically significant and negative for portfolio 4 at 90% confidence level, volume is statistically significant and positive for portfolio 1, portfolio 3, portfolio 4and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 4.While, daily returns are statistically significant and negative for portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.21, 0.24 and 0.38 respectively for model 4. These adjusted R squares indicate that information environment variables have 14% to 38% explanatory power for model 4. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 5, size is statistically significant and negative for portfolio 3 and portfolio 4, BTM ratio is statistically significant and positive for portfolio 3 and portfolio 5, volume is statistically significant positive for portfolio 3, portfolio 4, and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4. While, daily returns are statistically significant and negative for portfolio 3 and portfolio5 at 95% confidence level and for portfolio 2 and portfolio 5 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.17, 0.27, 0.24, 0.26 and 0.42 respectively for model 5. These adjusted R squares indicate that information environment variables have 17% to 42% explanatory power for model 5. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 5, size is statistically significant for portfolio 4, BTM ratio is statistically significant and positive for portfolio 5, volume is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.11, 0.26, 0.20, 0.25 and 0.42 respectively for model 6. These adjusted R squares indicate that information environment variables have 11% to 42% explanatory power for model 6. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 1, portfolio 3 and portfolio 5 at 95% confidence level and for portfolio 4 at 90% confidence level, size is statistically significant and negative for portfolio 4, BTM ratio is statistically significant and positive for portfolio 5 and volume is statistically significant and positive for portfolio 1, portfolio 3, portfolio 4, and portfolio 5. Weekly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.24, 0.27 and 0.42 respectively for model 7. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 7. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 5, size is statistically significant and negative for portfolio 4, BTM ratio is statistically significant and positive for portfolio 5, volume is statistically significant positive for portfolio 3, portfolio 4, and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. Weekly returns are statistically significant and negative for portfolio 1 to portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.17, 0.27, 0.24, 0.26 and 0.42 respectively for model 8. These adjusted R squares indicate that information environment variables have 17% to 42% explanatory power for model 8. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 2 at 90% confidence level and for portfolio 4 at 95% confidence level. Trading cost is statistically significant and positive for portfolio 5, size is statistically significant and negative for portfolio 3 and portfolio 4, BTM ratio is statistically significant and positive for portfolio 5, volume is statistically significant and positive for portfolio 3, portfolio 4, and for portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. While, Monthly return are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.11, 0.26, 0.21, 0.24 and 0.43 respectively for model 9. These adjusted R squares indicate that information environment variables have 11% to 43% explanatory power for model 9. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 3, and portfolio 5 at 95% confidence level and for portfolio 4 at 90% confidence level, size is statistically significant and negative for portfolio 4, BTM ratio is statistically significant and positive for portfolio 5, volume is statistically significant and positive for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 and monthly returns are statistically significant and negative for portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.24, 0.26 and 0.42 respectively for model 10. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 10. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4 at 95% confidence level and for portfolio 2 at 90% confidence level, trading cost is statistically significant and positive for portfolio 5, size is statistically significant and negative for portfolio 3 and portfolio 4, BTM ratio is statistically significant and positive for portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level, volume is statistically significant positive for portfolio 3, portfolio 4, and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. Monthly returns are statistically significant and negative forportfolio1, portfolio 3, portfolio 4 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.24, 0.26 and 0.42 respectively for model 11. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 11. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 1, size is statistically significant and negative for portfolio 4 at 95% confidence level and for portfolio 3 at 90% confidence level, BTM ratio is statistically significant and positive at portfolio 5, volume is statistically significant positive portfolio 3, portfolio 4, and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4.All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.11, 0.25, 0.18, 0.22 and 0.37 respectively for model 12. These adjusted R squares indicate that information environment variables have 11% to 37% explanatory power for model 12. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, size is statistically significant and negative for portfolio 4 at 90% confidence level, volume is statistically significant and positive for portfolio 1, portfolio

3, portfolio 4, and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and absolute returns are statistically significant and negative for portfolio 3 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.20, 0.24 and 0.37 respectively for model 13. These adjusted R squares indicate that information environment variables have 14% to 37% explanatory power for model 13. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and positive for portfolio 5, size is statistically significant and negative for portfolio 3 at 90% confidence level and portfolio 4 at 95% confidence level, BTM ratio is statistically significant and positive and significant for portfolio 2 and portfolio 5, volume is statistically significant positive for portfolio 3, portfolio 4, and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.20, 0.18 and 0.24 respectively for model 14. These adjusted R squares indicate that information environment variables have 14% to 26% explanatory power for model 14. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results age is statistically significant and negative for portfolio 4, trading cost is statistically significant and negative for portfolio 5, size is statistically significant at 95% confidence level for portfolio 5 and for portfolio 4 at 90% confidence level, BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level. Turnover rate is positive and significant for portfolio 3 at 90% confidence level and for portfolio 5 at 95% confidence level, illiquidity is statistically significant and positive for portfolio 3, percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level and daily returns are significant and negative for portfolio 3. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.05, 0.25, 0.10, 0.07 and 0.21 respectively for model 15. These adjusted R squares indicate that information environment variables have 5% to 25% explanatory power for model 15. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 1, portfolio 3, portfolio 4, trading cost is statistically significant and negative for portfolio 5 at 95% confidence level and for portfolio 3 at 90% confidence level, size is statistically significant and positive for portfolio 5, BTM ratio is statistically significant and positive for portfolio 3 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. Turnover rate is statistically significant and positive for portfolio 1 at 90% confidence level and for portfolio 3 and portfolio 5 at 95% confidence level and Illiquidity is statistically significant and positive for portfolio 3. Daily returns are statistically significant and negative for portfolio 4. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.18, 0.18 and 0.24 respectively for model 16. These adjusted R squares indicate that information environment variables have 14% to 26% explanatory power for model 16. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and negative for negative for portfolio 5, size is statistically significant and positive for portfolio 5 at 95% confidence level and negative for portfolio 3 at 90% confidence level, BTM ratio is statistically significant and positive for portfolio 2 and portfolio 5, turnover rate is statistically significant and positive for portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level.. Daily returns are statistically significant and negative for portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.23, 0.21 and 0.27 respectively for model 17. These adjusted R squares indicate that information environment variables have 16% to 27% explanatory power for model 17. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 2 at 90% confidence level and portfolio 4 at 95% confidence level, trading cost is statistically significant and negative for negative for portfolio 5 and size is statistically significant and positive for portfolio 5 and negative for portfolio 4.BTM ratio is statistically significant and positive for portfolio 2at 90% confidence level and for portfolio 5 at 95% confidence level, turnover rate is statistically significant and positive for portfolio 3 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3, portfolio 4 and portfolio 5. Weekly returns are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.07, 0.26, 0.13, 0.09 and 0.23 respectively for model 18. These adjusted R squares indicate that information environment variables have 7% to 26% explanatory power for model 18. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4, size is statistically significant and positive for portfolio 5 and BTM ratio is statistically significant and positive for portfolio 3, portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. Turnover rate is statistically significant and positive for portfolio 1, portfolio 3 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and portfolio 4. Weekly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.22, 0.21 and 0.27 respectively for model 19. These adjusted R squares indicate that information environment variables have 7% to 26% explanatory power for model 19. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 2 and portfolio 4 at 95% confidence level and for portfolio 1 at 90% confidence level, trading cost is statistically significant and negative for portfolio 5 at 90% confidence level, size is statistically significant and negative for portfolio 3, portfolio 4 and statistically significant and positive for portfolio 5.BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level, turnover rate is statistically significant and positive for portfolio 3 and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1 to portfolio 5.Weekly returns are statistically significant and negative for portfolio 1 to portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.23, 0.21 and 0.28 respectively for model 20. These adjusted R squares indicate that information environment variables have 16% to 28% explanatory power for model 20. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results indicate that age is statistically significant and negative for portfolio 4 at 95% confidence level and portfolio 1 and for portfolio 2 at 90% confidence level, trading cost is statistically negative for portfolio 5, size is statistically significant and negative for portfolio 3 and portfolio 4 and statistically significant and positive for portfolio 5, BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level. Turnover rate is statistically significant and positive for portfolio 3 and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. Monthly returns are statistically significant and negative for portfolio 1 to portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.07, 0.25, 0.13, 0.09 and 0.24 respectively for model 21. These adjusted R squares indicate that information environment variables have 7% to 24% explanatory power for model 21. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4 and trading cost is statistically positive for portfolio 3 and portfolio 5, while statistically significant and negative for portfolio 5 at 90% confidence level. Size is statistically significant and positive for portfolio 5, BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 4 and portfolio 5 at 95% confidence level. Turnover rate is statistically significant and positive for portfolio 1, portfolio 3 and portfolio 5, monthly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 and illiquidity is statistically significant and positive for portfolio 3. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.23, 0.21 and 0.29 respectively for model 22. These adjusted R squares indicate that information environment variables have 16% to 29% explanatory power for model 22. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 and portfolio 2 at 90% confidence level and for portfolio 4 at 95% confidence level and size is statistically significant and negative for portfolio 3 and portfolio 4 and statistically significant and positive for portfolio 5.BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level, turnover rate is significant and positive for portfolio 3 and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1 to portfolio 5. Weekly returns are significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.18, 0.18 and 0.21 respectively for model 23. These adjusted R squares indicate that information environment variables have 14% to 21% explanatory power for model 23. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4, trading cost is statistically significant and negative for portfolio 4 and statistically significant and positive for portfolio 5 and size is statistically significant and positive for portfolio 5 and statistically significant and negative for portfolio 4. BTM ratio is statistically significant and positive for portfolio 2 and portfolio 3 at 90% confidence level and for portfolio 5 at 95% confidence level, turnover rate is statistically significant and positive for portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and percentage of zero volume days are statistically significant and negative for portfolio 1 to portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.06, 0.25, 0.12, 0.08 and 0.19 respectively for model 24. These adjusted R squares indicate that information environment variables have 6% to 25% explanatory power for model 24. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 and portfolio 4 at 95% confidence level and for portfolio 3 at 90% confidence level, trading cost is statistically significant and positive for portfolio 3 at 90% confidence level, while statistically significant and negative for portfolio 5 at 95% confidence level and size is statistically significant and positive for portfolio 5.BTM ratio is statistically significant and positive for portfolio 3 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level, turnover rate is statistically significant and positive for portfolio 3 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3, portfolio 4 and absolute returns are statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.17, 0.18 and 0.22 respectively for model 25. These adjusted R squares indicate that information environment variables have 14% to 22% explanatory power for model 25. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 at 90% confidence level and for portfolio 4 at 95% confidence level, trading cost is statistically significant and negative for portfolio 5 and size is statistically significant and positive for portfolio 5 and statistically significant and negative for portfolio 3.BTM ratio is statistically significant and positive for portfolio 2 and portfolio 5, turnover rate is statistically significant and positive for portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1 to portfolio 5.Absolute returns are statistically significant and positive for portfolio 3. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.22, 0.23 and 0.39 respectively for model 26. These adjusted R squares indicate that information environment variables have 14% to 39% explanatory power for model 26. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4, size is statistically significant and negative for portfolio 3 and portfolio 4 and BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level. Value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4 at 95% confidence level and for portfolio 2 at 90% confidence level and daily returns are statistically significant and negative for portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.05, 0.25, 0.17, 0.21 and 0.39 respectively for model 27. These adjusted R squares indicate that information environment variables have 5% to 39% explanatory power for model 27. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 and portfolio 4, size is statistically significant and negative for portfolio 4 at 90% confidence level and BTM ratio is statistically significant and positive for portfolio 3 and portfolio 5 at 95% confidence level and for portfolio 2 at 90% confidence level. Illiquidity is statistically significant and negative for portfolio 3 at 90% confidence level and for portfolio 5 at 95% confidence level and value traded is statistically significant and positive for portfolio 1, portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.21, 0.23 and 0.39 respectively for model 28. These adjusted R squares indicate that information environment variables have 14% to 39% explanatory power for model 28. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4, size is statistically significant negative for portfolio 3 and portfolio 4 and value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5.BTM ratio is statistically significant and positive for portfolio 2 and portfolio 5, percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 3 and portfolio 4 at 95% confidence level and for portfolio 2 at 90% confidence level and daily returns are statistically significant and negative for portfolio 3 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.25, 0.26 and 0.42 respectively for model 29. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 29. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1, portfolio 2 at 90% confidence level and for portfolio 4 at 95% confidence level, size is statistically significant and positive for portfolio 3 and portfolio 4 and BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level. Value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 at 90% confidence level, percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4 and weekly returns are statistically significant and negative for portfolio 1 to portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.07, 0.26, 0.19, 0.23 and 0.42 respectively for model 30. These adjusted R squares indicate that information environment variables have 7% to 42% explanatory power for model 30. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 and portfolio 4, trading cost is statistically significant and positive for portfolio 5 and size is statistically significant and negative for portfolio 4.BTM ratio is statistically significant and positive for portfolio 2 and portfolio 3 at 90% confidence level and for portfolio 5 at 95% confidence level, value traded is statistically significant and positive for portfolio 1 to portfolio 5, illiquidity is statistically significant and positive for portfolio 3 at 95% confidence level and for portfolio 4 at 90% confidence level and weekly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5.All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.24, 0.26 and 0.42 respectively for model 31. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 31. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4 at 95% confidence level and for portfolio 1and portfolio 2 at 90% confidence level, size is statistically significant and negative for portfolio 3 and portfolio 4 and BTM ratio is statistically significant and positive for portfolio 4.Value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3, portfolio 4 and weekly returns are statistically significant and negative for portfolio 1 to portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.25, 0.26 and 0.42 respectively for model 32. These adjusted R squares indicate that information environment variables have 16% to 42% explanatory power for model 32. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4 at 95% confidence level and for portfolio 1 and portfolio 2 at 90% confidence level, size is statistically significant and negative for portfolio 3 and portfolio 4 and BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 5 at 95% confidence level, value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 at 90% confidence level and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3, portfolio 4. Monthly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.07, 0.25, 0.20, 0.22 and 0.43 respectively for model 33. These adjusted R squares indicate that information environment variables have 7% to 43% explanatory power for model 33. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 and portfolio 4, size is statistically significant and negative for portfolio 4 and BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 3 and portfolio 5 at 95% confidence level. Value traded is statistically significant and positive for portfolio 1, portfolio 3, portfolio 4 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and monthly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.16, 0.27, 0.24, 0.25 and 0.43 respectively for model 34. These adjusted R squares indicate that information environment variables have 16% to 43% explanatory power for model 34. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4 at 95% confidence level and for portfolio 1 and portfolio 2 at 90% confidence level, size is statistically significant and negative for portfolio

3 and portfolio 4 and BTM ratio is statistically significant and positive for portfolio 5.Value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3, portfolio 4 and Monthly returns are statistically significant and negative for portfolio 1, portfolio 3, portfolio 4 and portfolio 5. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.20, 0.23 and 0.37 respectively for model 35. These adjusted R squares indicate that information environment variables have 14% to 37% explanatory power for model 35. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4, size is statistically significant and negative for portfolio 3 at 90% confidence level and portfolio 4 at 95% confidence level and BTM ratio is statistically significant and positive for portfolio 2 and portfolio 3 at 90% confidence level and for portfolio 5 at 95% confidence level. Value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.07, 0.25, 0.17, 0.21 and 0.37 respectively for model 36. These adjusted R squares indicate that information environment variables have 7% to 37% explanatory power for model 36. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 1 and portfolio 4, size is statistically significant and negative for portfolio 4 at 90% confidence level and BTM ratio is statistically significant and positive for portfolio 2 at 90% confidence level and for portfolio 3 and portfolio 5 at 95% confidence level. Value traded is statistically significant and positive for portfolio 1, portfolio 3, portfolio 4 and portfolio 5, illiquidity is statistically significant and positive for portfolio 3 and portfolio 4 and absolute returns are statistically significant and negative for portfolio 1 and portfolio 3. All other variables are statistically insignificant.

Results of common effect model of appendix C report adjusted R square 0.14, 0.26, 0.20, 0.23 and 0.37 respectively for model 37. These adjusted R squares indicate that information environment variables have 7% to 24% explanatory power for model 37. So, this model for each portfolio explains a significant portion of SPS. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified. Results of indicate that age is statistically significant and negative for portfolio 4, size is statistically significant and negative for portfolio 3 and portfolio 4 and BTM ratio is statistically significant and positive for portfolio 2 and portfolio 5. Value traded is statistically significant and positive for portfolio 3, portfolio 4 and portfolio 5 and percentage of zero volume days are statistically significant and negative for portfolio 1, portfolio 2, portfolio 3 and portfolio 4. All other variables are statistically insignificant.

4.2.6 Discussion of Regression of SPS on information environment variables

Morck, Yeung, and Yu (2000) argue that in poor economies stock price are move together rather than rich economies. Because, developed and rich economies haves strong legal, better corporate governance practices, good institutional regulations and more enforced practices to implement of all laws. Which, promote informed based trading and turn into the effect of firm specific information incorporation into stock prices and, therefore, stock prices less co-move with the market. Grossman (1995) claims that more informed based trading can lead the stock prices away from the fair value (discounted present value) of cash flows, even in the presence of arbitragers. He suggests that informed traders are strongly associated with noise traders and counter balance the trade of noise traders. Alves et al. (2006) investigate that corporate governance and investor protection regimes of 40 countries and rank all the countries according to quality of countries information environment. They have ranked Pakistan for corporate governance and investor protection regimes below to the average.

The results of this study are in lined with the findings of West (1988) and Lettau Malkiel and Xu (2001). They suggest that the difference in idiosyncratic return volatility is not linked with the quality of information of firm specific variable, rather linked with noise in returns. In a higher quality of information environment, attention of more informed trader, greater age, lower trading cost, large size, value stocks, low Amihud illiquidity, high liquidity and large information events Kelly (2007). But, conversely Kelly (2007) argues that if noise traders' activities are present in the market then results of SPS and information variables may deviate from the fundamentals.

Table 4.10 reports that stocks of portfolio 5 have highest institutional ownership and are large firms. These results are not in line with fundament, but due to large firms because large stocks are more synchronize with market (Piotroski and Roulston, 2004). But regression results of institutional ownership are not statistically different from zero as estimated in table 4.14, table 4.15, table 4.16and appendix C. The overall results of table 4.14, table 4.15, table 4.16and appendix C suggest that age is not statistically significant for all models. But for some model in table 4.14 and portfolio 4 and portfolio 5 in appendix C age has statistically significant and negative relationship with SPS reflecting time variant information The older stocks have richer information environment and should have to increase stock return variation and reduce SPS and results are consistent with the results of Dasgupta et al. (2010).

The overall results of table 4.14, table 4.15 and table 4.16suggest that size has statistically significant and positive relationship with SPS, which captures the attention of traders means informed parties trading. Dasgupta et. al. (2010) suggest that large firms reveal trends of macro-economic information and the price behavior of these firms induce similar market movements and resulted to increase SPS. These results are in lined with previous studies (Piotroski and Roulston, 2004; Chan and Hameed, 2006; Ashbaugh-Skaife et al., 2006 and Kelly, 2007). But, in appendix C size is statistically significant only for portfolio 3, portfolio4 and portfolio 5. But, it is statistically significant and negative for portfolio 3 and portfolio 4 and statistically significant and positive for portfolio 5.

The overall results of table 4.14, table 4.15 and table 4.16 suggest that BTM ratio is not statistically different from zero. But BTM ratio is statistically significant and positive portfolio 2 and portfolio 5 in appendix C. Appendix C results are in line with Dahlquist and Robertsson (2001) and Dasgupta et al. (2010), they suggest that investors prefer to invest in growth firms. The overall results of table 4.14, table 4.15, table 4.16and Appendix C suggest that trading cost is statistically different from zero. Trading cost have mixed findings, but overall results suggest that when trading volume increases investor have not considered trading cost as restricted activity. But all other models present significant and negative impact of trading activity on SPS. Results are in lined with the finding of Bhushan (1994) who suggest that trading cost is negatively related to trading cost.

Overall results of liquidity (Volume, turnover rate and value traded) are statistically significant and positive as estimated in table 4.14, table 4.15, table 4.16and appendix C. Grossman and Stiglitz (1980) suggest that high liquidity facilitate informed based trading. In an information environment based analysis, trading activity i.e., liquidity should have to increase stock return variation and reduce SPS. So, the association between trading activities and SPS would be negative. However, if one assumes that SPS using R Square is a proxy of noise trading and unrelated to firm specific variables, then the association of trading activity is expected to be positive with SPS (Ashbaugh-Skaife et al., 2006).

Overall results of illiquidity (Amihud illiquidity and percentage of zero volume) are statistically significant as estimated in table 4.14, table 4.15, table 4.16and appendix C. The non-trading activity should have to decrease stock return variation and increase SPS. The overall results suggest that Amihud illiquidity has a significant and positive relationship with SPS. But percentage of zero volume illiquidity has a significant and negative relationship with SPS. Ashbaugh-Skaife et al. (2006) suggest infrequent trading with small amounts and non-information based trading slightly immaterial trades. That will result in unrelated firm specific information and lower SPS. All return measure except absolute returns have significant and negative relationship with SPS. Because, movement in stock returns is a trading activity that generates fluctuation in firm specific return and decrease SPS. The coefficients of absolute returns are negative. This result is most likely due to construction of the variable, which are the absolute values.

Table 4.15 presents the results of pool dummy variable analysis, where Automobile and parts industry is used as reference industry. The result shows that Chemical industry, Fixed Line industry and Oil and Gas and Construction and Material industry have a significantly different intercept value. The overall results of table 4.15 reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry, Oil and Gas industry and Construction and Material industry. All other industries have statistically insignificant values, which mean there is no difference in SPS in comparison to Automobile and parts industry.

Table 4.16 presents the results of pool dummy variable analysis, where portfolio 1 (lowest R square stocks portfolio) is used as reference portfolio. The result shows that portfolio 7, portfolio 8, portfolio 9 and portfolio 10 have a significantly different intercept value. The overall results of table 4.16 reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8, portfolio 9 and portfolio 10 or there is more noise in portfolio 1 stocks than portfolio 7, portfolio 8, portfolio 9 and portfolio 10. All other portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1.

The findings further suggest that more synchronize stocks have good quality of information environment. But overall findings of this study suggest that the difference in R square is not due to quality of information environment i.e., firm specific variable or due to informed based trading but elsewhere or poor information environment in Pakistani equity market. It might be due to the fluctuations in the behavior of the KSE for the sample period 2002 to 2012, and faced booms and crashes. KSE has been declared as the most liquid stock exchange in the world during 2002. It is contributed over Rs. 4 billion towards the national exchequer and one of the largest tax payer in Pakistan for the fiscal year 2006- 2007. Listed Companies contribute over 10% of total revenue collected by the Government of Pakistan. KSE brokers on average pay more than 50% of their profit before tax as presumptive tax and investors pay 10% tax on dividends. On April 20, 2008, the downfall of stock prices begins and in next four months the KSE index has plunged by 55 percent.

In august 2008, KSE has faced the great crash in the history of Pakistani equity market and swept over trillion rupees. Thousands of small investors have lost billions of rupees during the 2008 market floor, and the market crashed, this crash leads towards the cancellation of five largest brokers' membership. The KSE has offered just 6.7 per cent compensation against the investors claim, who lost their investments due to default of five brokers in the August-2008 market crash on the condition that they surrender their right to challenge the partial settlement in any court of law. To make matters worse, a 'floor' was placed under the market fall from Aug 27, 2008 to Dec 15, 2008 that turned the catastrophe into a calamity. The 'floor' remained in place for 108 days, which virtually closed the exit door of the market. On the basis of regression analysis, Hypothesis 2 and Hypothesis H11 are rejected. All other hypothesis of this section are accepted.

4.3 Results of Foreign investment and information environment quality variables

Section 4.3 reports the results of foreign investment and information variable for sample period from 2002 to 2012.

4.3.1 Correlation of Information Environment Variables &Foreign investment

The simple correlation between foreign investment and the information environment of stocks is calculated by using Pearson correlation coefficients and results are presented in table 4.17.

Table 4.17: Correlation of Information Environment Variables & foreign investment

	Fpi	**Ins.**	**Age**	**Tcost**	**Size**	**BTM**	**Vol**	**Trate**	**VT**	**Illiq.**	**ZVol.**	**DRet.**	**MRet.**	**WRet.**	**ARet.**
Fpi	1														
Ins.	0.53	1													
Age	0.06	0.03	1												
Tcost	0.40	0.29	0.27	1											
Size	0.33	0.25	0.10	0.63	1										
BTM	0.03	0.03	-0.02	0.03	0.10	1									
Vol	-0.07	0.01	-0.13	0.06	0.40	0.00	1								
Trate	0.01	0.07	-0.06	0.08	0.10	0.00	0.38	1							
VT	0.17	0.18	0.00	0.48	0.74	0.06	0.83	0.37	1						
Illiq.	-0.14	-0.17	-0.05	-0.20	-0.39	-0.15	-0.04	-0.04	-0.34	1					
ZVol.	-0.09	-0.09	0.02	-0.37	-0.51	-0.02	-0.64	-0.14	-0.66	0.14	1				
DRet.	0.03	0.05	-0.04	0.05	0.13	0.04	0.06	0.02	0.10	-0.17	-0.11	1			
MRet.	0.05	0.00	-0.09	0.06	0.13	0.04	0.05	0.10	0.10	-0.09	-0.11	0.29	1		
WRet.	0.05	0.00	-0.08	0.04	0.11	0.04	0.05	0.09	0.09	-0.09	-0.09	0.28	0.89	1	
ARet.	-0.15	-0.16	-0.03	-0.31	-0.52	-0.15	-0.20	-0.06	-0.43	0.62	0.43	-0.28	-0.12	-0.08	1

Note:

**FPI is Foreign portfolio investment calculated by percentage of Foreign ownership of the firms, Inst. is percentage of Institutional ownership, Age is Number of listed at stock market, Tcost is Trading cost, Size is Firm size, BTM is Book to market ratio, Vol is yearly average of daily volume, TRate is percentage of turnover rate, VT is the yearly average value of share traded daily, Illiq is Amihud Illiquidity, ZVol is percentage of zero volume days, Dret. is yearly average of daily returns, Wret., is yearly average of weekly returns, Mret. is is yearly average of monthly returns, Aret is yearly average of daily absolute return.*

Results of table 4.17 are inconsistent with Dahlquist and Robertsson (2001) and Gompers and Metrick (2001) that foreign investment is positively correlated with percentage of Institutional ownership, Age of stocks listed at stock market, Trading cost, Firm size, Book to market ratio, turnover rate, Value traded, yearly average of daily returns, yearly average of weekly returns, yearly average of monthly returns. It also confirms the results of Almazan et al. (2005) that institutional foreign investor prefers highly liquid stock. Whereas, negatively correlated with Amihud Illiquidity, volume, percentage of zero volume days and yearly average of daily absolute.

4.3.2 Regression of Foreign investment on information environment variables

To test the impact of information environment variables on foreign investment, cross section regressions are run on the information environment characteristics. Except the dependent variable percentage of foreign ownership, all independent variables of information environment are log transformation.

4.3.2.1 Time series cross-sectional regression of foreign investment on information environment variables

The results of common effect model for foreign investment and information environment variables are presented in table 4.18. The results for model 1 to model 10 are presented in table 4.18a have the following econometric models:

Model 1

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(VT)_{it} + \beta_8 \ln(Turnover\ rate)_{it} + \beta_9 \ln(ill)_{it} + \beta_{10} \ln(\%zero)_{it} + \beta_{11} \ln(DR)_{it} + \beta_{12} \ln(WR)_{it} + \beta_{13} \ln(MR)_{it} + \beta_{14} \ln(ABR)_{it} + \delta_{it}$$

Model 2

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \delta_{it}$$

Model 3

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

Model 4

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

Model 5

$$FPI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \delta_{it}$$

Model 6

$$FPI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

Model 7

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

Model 8

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \delta_{it}$$

Model 9

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

Model 10

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

In case of common effect model, results of model 1 to model 10 report adjusted R square between "0.367 to 0.370" approximately. These adjusted R squares indicate that information environment variables have 36.70 % to 37 % explanatory power of the models. So, these models based on information environment variables can explain a significant portion of the foreign investment. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified.

Table 4.18a: Time series cross-sectional regression of foreign investment on information environment variables for the period of 2002 to 2012

	1	2	3	4	5	6	7	8	9	10
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-1.305	0.139	0.132	0.225	-0.869	-0.872	-0.777	-0.161	-0.164	-0.110
Prob.	(0.201)	(0.612)	(0.628)	(0.406)	(0.138)	(0.135)	(0.184)	(0.441)	(0.429)	(0.596)
Ins. Own.	0.462	0.465	0.465	0.462	0.466	0.465	0.462	0.465	0.465	0.462
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	-0.015	-0.017	-0.017	-0.017	-0.015	-0.015	-0.016	-0.016	-0.016	-0.016
Prob.	(0.090)	(0.056)	(0.055)	(0.052)	(0.082)	(0.081)	(0.076)	(0.075)	(0.074)	(0.070)
Trade cost	0.033	0.052	0.052	0.053	0.052	0.052	0.054	0.052	0.052	0.054
Prob.	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.015	0.019	0.019	0.017	0.018	0.018	0.016	0.018	0.018	0.016
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BTM	-0.002	-0.001	-0.001	-0.007	-0.002	-0.002	-0.009	-0.002	-0.002	-0.009
Prob.	(0.965)	(0.981)	(0.978)	(0.838)	(0.954)	(0.953)	(0.795)	(0.962)	(0.961)	(0.805)
Vol.	-0.028	-0.014	-0.014	-0.013	-0.014	-0.014	-0.013	-0.014	-0.014	-0.013
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turn. rate	0.001									
Prob.	(0.998)									
Value traded	0.016									
Prob.	(0.014)									
Illiq.	0.364	0.214	0.213		0.235	0.234		0.231	0.231	
Prob.	(0.030)	(0.082)	(0.083)		(0.055)	(0.055)		(0.059)	(0.059)	
Zero Vol.	-0.027	-0.005		-0.003	-0.002		0.000	-0.002		0.000
Prob.	(0.327)	(0.839)		(0.890)	(0.946)		(0.985)	(0.936)		(0.998)
Daily Ret.	-0.288	-0.250	-0.246	-0.320						
Prob.	(0.397)	(0.434)	(0.441)	(0.314)						
Weekly Ret.	2.350				1.203	1.206	1.132			
Prob.	(0.192)				(0.138)	(0.137)	(0.163)			
Monthly Ret.	-0.276							0.182	0.183	0.168
Prob.	(0.507)							(0.330)	(0.326)	(0.371)
Abs. Ret.	0.132									
Prob.	(0.395)									
Adj. R	0.370	0.368	0.368	0.367	0.368	0.369	0.367	0.368	0.368	0.367
F stat.	71.042	109.008	122.699	122.106	109.288	123.022	122.291	109.067	122.773	122.064
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Inst. Own. is percentage of Institutional ownership, Age is Number of listed at stock market, Trade Cost is Trading cost, Size is Firm size, BTM is Book to market ratio, Vol is yearly average of daily volume, Turn. Rate is percentage of turnover rate, Value is the yearly average value of share traded daily, Illiq is Amihud Illiquidity, Zero Vol is percentage of zero volume days, Daily ret is yearly average of daily returns, Weekly ret., is yearly average of weekly returns, Monthly ret. is yearly average of monthly returns, Abs ret is is yearly average of daily absolute return and prob. is the value indicating the marginal probability of type 1 error..

Results of table 4.18a indicate that Institutional ownership, age, trading cost, size and volume are statistically different from zero as estimated by model 1 to model 10 and value traded is also significant for model 1 while Amihud illiquidity is significant in model 1, model 2, model 3, model 5, model 6, model 8 and model 9.Institutional ownership is statistically significant and positive that means it is different from zero for each of the model 1 to model 10.The beta coefficient values of institutional ownership are between “0.462 to 0.466”. This indicates that 1% increase in ownership can increase foreign investment by “0.462 to 0.466” percent. Age is statistically significant and negative for each of the model 1 to model 10 at 90% confidence level. The beta coefficient values of age are from “-0.015 to -0.017”. That means 1% increase in age can decrease foreign investment by “0.015 to 0.017” percent.

Trading cost is statistically significant and positive that means it is different from zero for each of the model 1 to model 10. The beta coefficients of trading cost have the values from “0.033 to 0.054”. That means 1% increase in trade cost can increase foreign investment by “0.033 to 0.054” percent. Size is statistically significant and positive that means it is different from zero for each of the model 1 to model 10. The beta coefficient values for size is from “0.015 to 0.019”. That means 1% increase in size can increase foreign investment by “0.015 to 0.019” percent. Volume is statistically significant and negative for each of the model 1 to model 10. The beta coefficient values for volume is from “-0.013 to -0.028”. That means 1% increase in volume can decrease foreign investment by “0.013 to 0.028” percent. Value traded is statistically significant and positive that means it is different from zero for each of the model 1. The beta coefficient value for value traded is 0.016 approximately. That means 1% increase in value traded can increase foreign investment by 0.016 percent.

Amihud illiquidity is statistically significant and positive for model 1, model 5, model 6, model 8 and model 9 at 95% confidence level and for model 2 and model 3 at 95% confidence level. The beta coefficient values for illiquidity are from “0.214 to 0.364”. That means 1% increase in illiquidity can increase foreign investment by 0.214 to 0.364 percent. Daily, monthly and absolute returns are statistically insignificant for all the models.

The results for model 11 to model 19 are presented in table 4.18b have the following econometric models:

Model 11

$$\mathrm{FI}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

Model 12

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 13

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 14

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \delta_{it}$$

Model 15

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

Model 16

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

Model 17

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \delta_{it}$$

Model 18

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

Model 19

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

Under the assumption of constant intercept, results of table 4.18b from model 11 to model 19present adjusted R square between “0.355to 0.368” approximately. These adjusted R squares indicate that information environment variables have “35.5% to 36.8%” explanatory power of the models. The adjusted R squares of model 11 to model 19are consistent with the adjusted R squares of model 1 to model 10. So, these models based on information environment variables can also explain a significant portion of foreign investment. Moreover, goodness of fit statistics is statistically significant indicating that model is correctly specified.

Table 4.18b: Time series cross-sectional regression of foreign investment on information environment variables for the period of 2002 to 2012

	11	12	13	14	15	16	17	18	19
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-0.049	-0.056	-0.038	-0.096	-0.019	-0.052	-1.368	-1.255	-1.313
Prob.	(0.766)	(0.732)	(0.814)	(0.725)	(0.944)	(0.848)	(0.020)	(0.034)	(0.025)
Ins. Own.	0.465	0.464	0.463	0.471	0.476	0.469	0.472	0.478	0.470
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	-0.016	-0.017	-0.017	-0.012	-0.008	-0.012	-0.010	-0.006	-0.010
Prob.	(0.059)	(0.056)	(0.057)	(0.180)	(0.380)	(0.172)	(0.257)	(0.507)	(0.244)
Trade cost	0.051	0.053	0.052	0.068	0.064	0.068	0.068	0.064	0.068
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.019	0.019	0.019	0.013	0.008	0.012	0.013	0.008	0.012
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.003)	(0.000)
BTM	0.001	0.001	0.000	0.005	0.010	0.001	0.003	0.009	-0.001
Prob.	(0.970)	(0.983)	(0.990)	(0.898)	(0.779)	(0.968)	(0.932)	(0.809)	(0.982)
Vol.	-0.014	-0.014	-0.014						
Prob.	(0.000)	(0.000)	(0.000)						
Turn. rate				-1.025	-1.025	-1.028	-1.064	-1.062	-1.067
Prob.				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Value traded									
Prob.									
Illiq.	0.142	0.152		0.100	0.069		0.120	0.092	
Prob.	(0.330)	(0.293)		(0.415)	(0.573)		(0.322)	(0.449)	
Zero Vol.	-0.013		-0.016	0.085		0.084	0.087		0.086
Prob.	(0.628)		(0.531)	(0.000)		(0.000)	(0.000)		(0.000)
Daily Ret.				-0.155	-0.241	-0.190			
Prob.				(0.629)	(0.455)	(0.551)			
Weekly Ret.							1.681	1.546	1.639
Prob.							(0.000)	(0.000)	(0.000)
Monthly Ret.									
Prob.									
Abs. Ret.	0.162	0.138	0.242						
Prob.	(0.285)	(0.335)	(0.057)						
Adj. R	0.368	0.368	0.368	0.362	0.355	0.362	0.363	0.356	0.363
F stat.	109.101	122.766	122.624	106.162	116.098	119.374	106.863	116.682	120.099
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All variables are the same as defined in table 4.18a

Results of table 4.18b indicate that Institutional ownership, trade cost, and size are statistically different from zero as estimated by model 11 to model 19 and age and volume are significant for model 11, model 12, model 13, turnover rate is significant in model 14 to model 19 while zero volume in model 14, 16, 17 and model 19.Institutional ownership is statistically significant and positive that means it is different from zero for each of the model 11 to model 19.The beta coefficients of Institutional ownership have the values between "0.463 to 0.471". This indicates that 1% increase in ownership can increase foreign investment by "0.463 to 0.471" percent.Age is statistically significant and negative for model 11, model 12 and model 13.The beta coefficients of age have the values from -0.016 to -0.017. That means 1% increase in age can decrease foreign investment by "0.016 to 0.017" percent.

Trading cost is statistically significant and positive that means it is different from zero for each of the model 11 to model 19. The beta coefficients of trading cost have the values between "0.051 to 0.068". That means 1% increase in trading cost can increase foreign investment by "0.051 to 0.068" percent. Size is statistically significant and positive that means it is different from zero for each of the model 11 to model 19. The beta coefficient values for size are between "0.008 to 0.019". That means 1% increase in size can increase foreign investment by "0.008 to 0.019" percent. Volume is statistically significant and negative for each of the model 11, model 12 and model 13. The beta coefficient values for volume are -0.014 approximately. That means 1% increase in volume can decrease foreign investment by 0.014 percent. Turnover rate is statistically significant and negative for each of the model 14 to model 19. The beta coefficient values for turnover rate are between "-1.025 to -1.067". That means 1% increase in turnover rate can decrease foreign investment by "1.025 to 1.067" percent.

Percentage of zero volume days is statistically significant and positive for model 14, model 16, model 17 and model 19. The beta coefficient values for percentage of zero volume days are between "0.085 to 0.087". That means 1% increase in zero volume can increase foreign investment by "0.085 to 0.087" percent. Average returns of daily and absolute returns for model 11 to 19 are insignificant but weekly returns for model 11 to 19 have positive and significant relationship with foreign investment. The beta coefficient values for weekly returns are1.546, "1.639 and 1.681". That means 1% increase in zero volume can increase foreign investment by "1.546 to 1.681" percent.

The results for model 20 to model 28 are presented in table 4.18c have the following econometric models:

Model 20

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Turnover\ rate)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(\%zero)_{it} + \beta_9\ln(MR)_{it} + \delta_{it}$$

Model 21

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Turnover\ rate)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(MR)_{it} + \delta_{it}$$

Model 22

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Turnover\ rate)_{it} + \beta_7\ln(\%zero)_{it} + \beta_8\ln(MR)_{it} + \delta_{it}$$

Model 23

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Turnover\ rate)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(\%zero)_{it} + \beta_9\ln(ABR)_{it} + \delta_{it}$$

Model 24

$$\%FPI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Turnover\ rate)_{it} + \beta_7\ln(ill)_{it} + \beta_9\ln(ABR)_{it} + \delta_{it}$$

Model 25

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Turnover\ rate)_{it} + \beta_7\ln(\%zero)_{it} + \beta_9\ln(ABR)_{it} + \delta_{it}$$

Model 26

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(VT)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(\%zero)_{it} + \beta_9\ln(DR)_{it} + \delta_{it}$$

Model 27

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(VT)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(DR)_{it} + \delta_{it}$$

Model 28

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(VT)_{it} + \beta_7\ln(\%zero)_{it} + \beta_8\ln(DR)_{it} + \delta_{it}$$

In case of pooled regression, results of table 4.18c from model 20 to model 28 have adjusted R square between "0.356to 0.363" approximately. These adjusted R squares indicate that information environment variables have 35.60 % to 36.30 % explanatory power of the models. The adjusted R squares of model 20 to model 28are consistent with the adjusted R squares of model 1 to model 19. So, these models based on information environment variables can explain a significant portion of the dependent variable and model fitness statistics are statistically significant.

Table 4.18c: Time series cross-sectional regression of foreign investment on information environment variables for the period of 2002 to 2012

	20	21	22	23	24	25	26	27	28
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-0.418	-0.375	-0.387	-0.207	-0.212	-0.200	0.095	0.145	0.110
Prob.	(0.044)	(0.072)	(0.059)	(0.202)	(0.194)	(0.218)	(0.731)	(0.596)	(0.684)
Ins. Own.	0.472	0.477	0.470	0.471	0.476	0.470	0.469	0.470	0.468
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	-0.010	-0.006	-0.010	-0.012	-0.008	-0.012	-0.016	-0.015	-0.016
Prob.	(0.245)	(0.486)	(0.233)	(0.186)	(0.371)	(0.181)	(0.066)	(0.078)	(0.064)
Trade cost	0.068	0.064	0.068	0.068	0.064	0.068	0.070	0.069	0.070
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.013	0.008	0.012	0.013	0.010	0.013	0.020	0.020	0.020
Prob.	(0.000)	(0.003)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
BTM	0.003	0.009	0.000	0.005	0.013	0.004	0.002	0.003	0.001
Prob.	(0.924)	(0.802)	(0.991)	(0.892)	(0.723)	(0.918)	(0.951)	(0.923)	(0.973)
Vol.									
Prob.									
Turn. rate	-1.057	-1.054	-1.060	-1.027	-1.025	-1.028			
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Value traded							-0.011	-0.013	-0.011
Prob.							(0.000)	(0.000)	(0.000)
Illiq.	0.117	0.089		0.091	-0.031		0.031	0.009	
Prob.	(0.334)	(0.464)		(0.533)	(0.830)		(0.804)	(0.940)	
Zero Vol.	0.087		0.086	0.084		0.081	0.034		0.033
Prob.	(0.000)		(0.000)	(0.000)		(0.000)	(0.147)		(0.152)
Daily Ret.							-0.240	-0.275	-0.251
Prob.							(0.456)	(0.391)	(0.431)
Weekly Ret.									
Prob.									
Monthly Ret.	0.311	0.275	0.302						
Prob.	(0.099)	(0.146)	(0.109)						
Abs. Ret.				0.031	0.212	0.083			
Prob.				(0.839)	(0.141)	(0.508)			
Adj. R	0.363	0.356	0.363	0.362	0.356	0.362	0.362	0.361	0.362
F stat.	106.598	116.402	119.810	106.129	116.412	119.390	106.256	119.195	119.598
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All variables are the same as defined in table 4.18a

Results of table 4.18c indicate that Institutional ownership, trade cost, and size are statistically different from zero as estimated by model 20 to model 28 and value traded is also significant for model 26 to model 28, turnover rate model 20 to model 25 while zero volume is significant in model 20, model 22, model 23 and model 25.

Institutional ownership is statistically significant and positive that means it is different from zero for each of the model 20 to model 28. The beta coefficients of Institutional ownership have the values between “0.468 to 0.472”. This indicates that 1% increase in ownership can increase foreign investment by “0.468 to 0.472” percent. Age is statistically significant and negative for model 26, model 27 and model 28 at 90% confidence level. The beta coefficients of age have the values from “-0.015 to -0.016”. That means 1% increase in age can decrease foreign investment by “0.015 to 0.016” percent. Trading cost is statistically significant and positive that means it is different from zero for each of the model 20 to model 28. The beta coefficients of trading cost have the values from “0.064 to 0.070”. That means 1% increase in trading cost can increase foreign investment by “0.064 to 0.070” percent.

Size is statistically significant and positive that means it is different from zero for each of the model 20 to model 28. The beta coefficients values for size are between “0.008 to 0.020”. That means 1% increase in size can increase foreign investment by “0.008 to 0.020” percent. Turnover rate is statistically significant and negative for each of the model 20 to model 25. The beta coefficients values for turnover rate are in between “-1.027 to -1.060”. That means 1% increase in turnover rate can decrease foreign investment by “1.027 to 1.060” percent. Value traded is statistically significant and negative for each of the model 26 to model 28. The beta coefficients values for value traded are between “-0.016 to -0.13”. That means 1% increase in value traded can decrease foreign investment by “0.016 to 0.13” percent. Percentage of zero volume days is statistically significant and positive for model 20, model 22, model 23 and model 25. The beta coefficients values for zero volume are from “0.081 to 0.087”. That means 1% increase in zero volume can increase foreign investment by “0.081 to 0.087” percent. Book to market ratio, Illiquidity, daily, monthly and absolute returns are statistically insignificant for all the models.

The results for model 29 to model 37 are presented in table 4.18d have the following econometric models:

Model 29

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \delta_{it}$$

Model 30

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

Model 31

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

Model 32

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \delta_{it}$$

Model 33

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

Model 34

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

Model 35

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 36

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

Model 37

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

In case of common effect model, results of regression from model 29 to model 37 have adjusted R square is between "0.362to 0.363" approximately. These adjusted R squares indicate that information environment variables have 36.2% to 36.3 % explanatory power of the models. The adjusted R squares of model 29 to model 37 are consistent with the adjusted R squares of model 1 to model 28. So, these models based on information environment variables can explain a significant portion of the dependent variable and model fitness statistics are statistically significant.

Table 4.18d: Time series cross-sectional regression of foreign investment on information environment variables for the period of 2002 to 2012

	29	30	31	32	33	34	35	36	37
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-0.992	-0.927	-0.966	-0.223	-0.184	-0.207	-0.082	-0.067	-0.084
Prob.	(0.092)	(0.114)	(0.099)	(0.288)	(0.378)	(0.315)	(0.618)	(0.681)	(0.606)
Ins. Own.	0.469	0.471	0.469	0.469	0.471	0.468	0.468	0.470	0.469
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	-0.015	-0.014	-0.015	-0.015	-0.014	-0.015	-0.016	-0.015	-0.016
Prob.	(0.097)	(0.116)	(0.093)	(0.090)	(0.107)	(0.087)	(0.069)	(0.079)	(0.070)
Trade cost	0.070	0.069	0.070	0.070	0.069	0.070	0.070	0.069	0.070
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.019	0.019	0.019	0.019	0.019	0.019	0.020	0.020	0.020
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BTM	0.001	0.002	-0.001	0.001	0.003	0.000	0.004	0.006	0.004
Prob.	(0.981)	(0.950)	(0.980)	(0.973)	(0.942)	(0.990)	(0.917)	(0.875)	(0.911)
Vol.									
Prob.									
Turn. rate									
Prob.									
Value traded	-0.011	-0.013	-0.011	-0.011	-0.013	-0.011	-0.011	-0.013	-0.011
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Illiq.	0.054	0.032		0.051	0.029		-0.020	-0.068	
Prob.	(0.659)	(0.533)		(0.533)	(0.830)		(0.804)	(0.940)	
Zero Vol.	0.037		0.035	0.036		0.035	0.029		0.030
Prob.	(0.114)		(0.124)	(0.116)		(0.125)	(0.235)		(0.203)
Daily Ret.									
Prob.									
Weekly Ret.	1.329	1.275	1.310						
Prob.	(0.103)	(0.117)	(0.107)						
Monthly Ret.				0.218	0.203	0.214			
Prob.				(0.246)	(0.281)	(0.254)			
Abs. Ret.							0.115	0.173	0.103
Prob.							(0.448)	(0.229)	(0.409)
Adj. R	0.363	0.362	0.363	0.362	0.362	0.362	0.362	0.362	0.362
F stat.	106.624	119.533	119.986	106.395	119.280	119.732	106.259	119.336	119.610
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All variables are the same as defined in table 4.18a

Results of table 4.18d indicate that Institutional ownership, age, trade cost, size and value traded are statistically different from zero as estimated by model 29 to 37 and age except in model 30. Institutional ownership is statistically significant and positive that means it is different from zero for each of the model 29 to model 37. The beta coefficients of Institutional ownership have the values between “0.464 to 0.471”. This indicates that 1% increase in Institutional ownership can increase foreign investment by “0.464 to 0.471” percent. Age is statistically significant and negative for model 29, model 31, model 32, model 33, model 34, model 35, model 36 and model 37. The beta coefficients of age have the values from “-0.014 to -0.016”.That means 1% increase in age can decrease foreign investment by “0.014 to 0.016 percent”.

Trading cost is statistically significant and positive that means it is different from zero for each of the model 29 to model 37. The beta coefficients of trading cost have the values from “0.069 to 0.070”. That means 1% increase in trading cost can increase foreign investment by 0.069 to 0.070 percent. Size is statistically significant and positive that means it is different from zero for each of the model 29 to model 37. The beta coefficients values for size are between “0.019 to 0.020”. That means 1% increase in size can increase foreign investment by “0.019 to 0.020” percent. Value traded is statistically significant and negative for each of the model 29 to model 37. The beta coefficients values for value traded are in between “-0.011 to -0.013”. That means 1% increase in value traded can decrease foreign investment by “0.011 to 0.013” percent. BTM ratio, percentage of zero volume, weekly, monthly and absolute returns are statistically insignificant for all the models.

Results of table 4.18 indicate that Institutional ownership, age, trading cost, size, liquidity and illiquidity are statistically different from zero. But, the association between trading activities including trading cost and liquidity with foreign investment is found negative and percentage of zero volume is positive. It might be the effect of herding and unrelated firm specific variables in emerging markets; the stocks are not in lined with trading mechanism rather linked with noise trading activities. The coefficient estimates of book to market ratio and returns are insignificant in overall regressions. The findings of this study suggest that the difference firm specific variable is due to poor information environment in Pakistani equity market.

4.3.2.2 Pool dummy regression of foreign investment on information environment variables for industry effect

The results for model 1 to model 6 for pool dummy variable analysis is presented in table 4.19a have the following econometric models:

Model 1

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 2

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 3

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 4

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 5

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 6

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.19a: Pool dummy regression with base industry of Automobile and Parts of foreign investment on information environment variables for the period of 2002 to 2012

	1		2		3		4		5		6	
	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.
Const.	-0.20	0.44	-0.15	0.55	-0.08	0.74	-0.18	0.36	-0.14	0.47	-0.12	0.55
Ins. Own.	0.43	0.00	0.43	0.00	0.43	0.00	0.43	0.00	0.44	0.00	0.43	0.00
Age	-0.02	0.05	-0.02	0.06	-0.02	0.05	-0.02	0.07	-0.02	0.07	-0.02	0.06
Trade cost	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00
Size	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00
BTM	0.00	0.89	0.00	0.90	-0.01	0.68	-0.01	0.88	0.00	0.89	-0.01	0.67
Vol.	-0.01	0.00	-0.02	0.00	-0.01	0.00	-0.01	0.00	-0.02	0.00	-0.01	0.00
Turn. rate												
Value traded												
Illiq.	0.28	0.02	0.28	0.02			0.27	0.02	0.28	0.02		
Zero Vol.	0.03	0.16			0.04	0.14	0.04	0.15			0.04	0.13
Daily Ret.	0.24	0.43	0.20	0.49	0.15	0.62						
Weekly Ret.												
Monthly Ret.							0.21	0.24	0.19	0.29	0.19	0.27
Abs. Ret.												
Chemicals	0.11	0.00	0.12	0.00	0.11	0.00	0.12	0.00	0.12	0.00	0.12	0.00
Construction and Materials	0.01	0.82	0.01	0.69	0.00	0.83	0.01	0.77	0.01	0.64	0.01	0.79
Electricity	-0.01	0.68	-0.01	0.73	-0.01	0.75	-0.01	0.75	-0.01	0.80	-0.01	0.82
Fixed Line Telecommunication	0.06	0.06	0.06	0.04	0.06	0.06	0.06	0.05	0.06	0.04	0.06	0.06
Food Producers	0.00	0.84	0.00	0.98	-0.01	0.77	0.00	0.84	0.00	0.98	-0.01	0.76
General Industries	-0.03	0.19	-0.03	0.25	-0.03	0.17	-0.03	0.20	-0.03	0.25	-0.03	0.18
Household Goods	0.14	0.00	0.15	0.00	0.14	0.00	0.14	0.00	0.15	0.00	0.14	0.00
Industrial Engineering	0.05	0.07	0.05	0.06	0.05	0.07	0.05	0.07	0.05	0.06	0.05	0.07
Oil and Gas	0.01	0.55	0.02	0.41	0.01	0.54	0.01	0.53	0.02	0.39	0.02	0.52
Personal Goods	-0.01	0.48	-0.01	0.67	-0.01	0.53	-0.01	0.50	-0.01	0.69	-0.01	0.54
Pharma and Bio Tech	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00
Tobacco	0.28	0.00	0.28	0.00	0.28	0.00	0.27	0.00	0.28	0.00	0.28	0.00
Travel and Leisure	-0.15	0.00	-0.14	0.00	-0.15	0.00	-0.15	0.00	-0.14	0.00	-0.15	0.00
Adj. R	0.46		0.46		0.45		0.46		0.46		0.45	
F stat.	64.54		67.47		67.14		64.60		67.53		67.23	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.15a and table 4.18a

The above table presents the results of pool dummy variable analysis. In table 4.19a the results for model 1 to model 6, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Fixed Line industry, House hold goods industry, Industrial Engineering industry, Pharma and Bio industry, Tobacco industry and Travel and Leisure industry have significantly different intercept in model 1 to model 6. The Chemical industry have an intercept of “0.11 to 0.12” which means that foreign investment is higher for Chemical industry than Automobile and parts industry. The Fixed Line industry has an intercept of 0.06 which means that foreign investment is higher for Fixed Line industry than Automobile and parts industry. The house hold goods industry has an intercept of “0.14 to 0.15” which means that that foreign investment is higher for house hold goods industry than Automobile and parts industry. The Industrial Engineering industry has an intercept of 0.05which means that that foreign investment is higher for Industrial Engineering industry than Automobile and parts industry.

The Pharma and Bio industry has an intercept of 0.16which means foreign investment is higher for Pharma and Bio industry than Automobile and parts industry. The Tobacco industry has an intercept of “0.27 to 0.28” which means foreign investment is higher for Tobacco industry than Automobile and parts industry. The Transportation and leisure industry has an intercept of “-0.14 to -0.15” which means that foreign investment is lower for Transportation and leisure industry than Automobile and parts industry.

The overall results of table 4.19a reflect that foreign investment is higher in Chemical industry, Fixed Line industry, House hold goods industry, Industrial Engineering industry, Pharma and Bio industry, Tobacco industry and Travel and Leisure in comparison to Automobile and parts industry and foreign investment is lower in Transportation and leisure industry in comparison to Automobile and parts industry. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

The results for model 7 to model 12 for pool dummy variable analysis is presented in table 4.19b have the following econometric models:

Model 7

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Vol)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(\%zero)_{it} + \beta_9\ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 8

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Vol)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 9

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Vol)_{it} + \beta_7\ln(\%zero)_{it} + \beta_8\ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 10

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Vol)_{it} + \beta_7\ln(ill)_{it} + \beta_8\ln(\%zero)_{it} + \beta_9\ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 11

$$FI_{i,t} = SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Vol)_{it} + \beta_7\ln(ill)_{it} + \beta_9\ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 12

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2\ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4\ln(Size)_{it} + \beta_5\ln(BTM)_{it} + \beta_6\ln(Vol)_{it} + \beta_7\ln(\%zero)_{it} + \beta_9\ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.19b: Pool dummy regression with base industry of Automobile and Parts of foreign investment on information environment variables for the period of 2002 to 2012

	7		8		9		10		11		12
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.
Const.	-0.98	0.08	-0.90	0.10	-0.87	0.11	-0.05	0.76	-0.04	0.82	-0.03
Ins. Own.	0.43	0.00	0.44	0.00	0.43	0.00	0.43	0.00	0.43	0.00	0.43
Age	-0.01	0.08	-0.01	0.08	-0.02	0.07	-0.02	0.05	-0.02	0.06	-0.02
Trade cost	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05
Size	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02
BTM	-0.01	0.86	-0.01	0.87	-0.01	0.66	0.00	0.95	0.00	0.97	-0.01
Vol.	-0.01	0.00	-0.02	0.00	-0.01	0.00	-0.01	0.00	-0.02	0.00	-0.01
Turn. rate											
Value traded											
Illiq.	0.27	0.02	0.28	0.02			0.20	0.14	0.18	0.18	
Zero Vol.	0.04	0.14			0.04	0.12	0.03	0.31			0.02
Daily Ret.											
Weekly Ret.	1.36	0.07	1.28	0.09	1.29	0.09					
Monthly Ret.											
Abs. Ret.							0.13	0.36	0.18	0.20	0.24
Chemicals	0.11	0.00	0.12	0.00	0.11	0.00	0.11	0.00	0.12	0.00	0.12
Construction and Materials	0.01	0.80	0.01	0.66	0.01	0.81	0.01	0.82	0.01	0.73	0.00
Electricity	-0.01	0.77	-0.01	0.82	-0.01	0.84	-0.01	0.69	-0.01	0.72	-0.01
Fixed Line Telecommunication	0.06	0.05	0.06	0.03	0.06	0.05	0.06	0.06	0.06	0.05	0.06
Food Producers	0.00	0.82	0.00	0.99	-0.01	0.75	0.00	0.87	0.00	0.99	0.00
General Industries	-0.03	0.19	-0.03	0.25	-0.03	0.17	-0.03	0.21	-0.03	0.25	-0.03
Household Goods	0.14	0.00	0.15	0.00	0.14	0.00	0.14	0.00	0.15	0.00	0.14
Industrial Engineering	0.05	0.07	0.05	0.06	0.05	0.07	0.05	0.07	0.05	0.06	0.05
Oil and Gas	0.01	0.53	0.02	0.39	0.02	0.52	0.01	0.55	0.02	0.46	0.01
Personal Goods	-0.01	0.49	-0.01	0.70	-0.01	0.54	-0.01	0.48	-0.01	0.60	-0.01
Pharma and Bio Tech	0.16	0.00	0.16	0.00	0.16	0.00	0.15	0.00	0.15	0.00	0.15
Tobacco	0.27	0.00	0.28	0.00	0.28	0.00	0.27	0.00	0.28	0.00	0.27
Travel and Leisure	-0.15	0.00	-0.14	0.00	-0.15	0.00	-0.15	0.00	-0.15	0.00	-0.15
Adj. R	0.46		0.46		0.45		0.46		0.46		0.46
F stat.	64.76		67.69		67.37		64.56		67.58		67.48
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00

Note: All variables are the same as defined in table 4.15a and table 4.18a

The above table presents the results of pool dummy variable analysis. In table 4.19a the results for model 7 to model 12, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, Construction & Material industry, Food Producers industry, Industrial Engineering industry, Oil & Gas industry, Tobacco industry and Travel and leisure industry have a significant different intercept in model 7 to 12 while Chemical industry significantly different intercept in model 7 to model 12.The Chemical industry has an intercept of 0.24, the Construction & Material industry has intercept of “0.11 to 0.12”, the Food Producers industry has an intercept of 0.06, the Industrial Engineering industry has an intercept of “0.14 to 0.15”, the Oil & Gas industry has an intercept of 0.05,the Tobacco industry has an intercept of “0.15 to 0.16”, the Transportation and leisure industry has an intercept of “0.27 to 0.28” which means that foreign investment is higher in Chemical industry, Construction & Material industry, Food Producers industry, Industrial Engineering industry, Oil & Gas industry, Tobacco industry and Travel and leisure industry than Automobile and parts industry.

The overall results of table 4.19b reflect that foreign investment is higher in Chemical industry, Construction & Material industry, Food Producers industry, Industrial Engineering industry, Oil & Gas industry, Tobacco industry and Travel and leisure industry in comparison to Automobile and parts industry. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

The results for model 13 to model 18 for pool dummy variable analysis is presented in table 4.19c have the following econometric models:

Model 13

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 14

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 15

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 16

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 17

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 18

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.19c: Pool dummy regression with base industry of Automobile and Parts of foreign investment on information environment variables for the period of 2002 to 2012

	13		14		15		16		17		18	
	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.
Const.	-0.41	0.11	-0.32	0.22	-0.32	0.20	-0.39	0.05	-0.34	0.09	-0.34	0.08
Ins. Own.	0.44	0.00	0.46	0.00	0.44	0.00	0.44	0.00	0.46	0.00	0.44	0.00
Age	-0.02	0.07	-0.01	0.12	-0.02	0.06	-0.01	0.09	-0.01	0.15	-0.01	0.08
Trade cost	0.07	0.00	0.06	0.00	0.07	0.00	0.07	0.00	0.06	0.00	0.07	0.00
Size	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00
BTM	0.00	0.91	0.01	0.75	0.00	0.93	0.00	0.93	0.01	0.76	0.00	0.92
Vol.												
Turn. rate	-0.47	0.03	-0.55	0.01	-0.47	0.03	-0.50	0.02	-0.58	0.01	-0.50	0.02
Value traded												
Illiq.	0.19	0.10	0.16	0.18			0.18	0.11	0.15	0.19		
Zero Vol.	0.11	0.00			0.11	0.00	0.11	0.00			0.11	0.00
Daily Ret.	0.29	0.33	0.18	0.56	0.23	0.44						
Weekly Ret.												
Monthly Ret.							0.27	0.13	0.20	0.27	0.26	0.15
Abs. Ret.												
Chemicals	0.10	0.00	0.11	0.00	0.10	0.00	0.10	0.00	0.11	0.00	0.10	0.00
Construction and Materials	0.00	0.88	0.01	0.67	0.00	0.88	0.00	0.94	0.01	0.63	0.00	0.94
Electricity	-0.03	0.29	-0.03	0.27	-0.02	0.33	-0.02	0.35	-0.03	0.31	-0.02	0.39
Fixed Line Telecommunicatio	0.04	0.14	0.05	0.08	0.04	0.14	0.05	0.12	0.05	0.07	0.05	0.12
Food Producers	0.00	1.00	0.02	0.24	0.00	0.93	0.00	0.99	0.02	0.24	0.00	0.92
General Industries	-0.03	0.21	-0.01	0.59	-0.03	0.20	-0.03	0.22	-0.01	0.60	-0.03	0.20
Household Goods	0.13	0.00	0.14	0.00	0.13	0.00	0.13	0.00	0.14	0.00	0.13	0.00
Industrial Engineering	0.05	0.04	0.07	0.01	0.05	0.04	0.06	0.03	0.07	0.01	0.06	0.04
Oil and Gas	-0.01	0.75	0.00	0.91	-0.01	0.78	-0.01	0.79	0.00	0.88	-0.01	0.82
Personal Goods	-0.02	0.41	0.01	0.64	-0.02	0.44	-0.02	0.43	0.01	0.62	-0.01	0.46
Pharma and Bio	0.17	0.00	0.18	0.00	0.17	0.00	0.17	0.00	0.18	0.00	0.17	0.00
Tobacco	0.28	0.00	0.31	0.00	0.28	0.00	0.28	0.00	0.31	0.00	0.28	0.00
Travel and Leisure	-0.14	0.00	-0.10	0.00	-0.14	0.00	-0.14	0.00	-0.10	0.00	-0.14	0.00
Adj. R	0.44		0.44		0.44		0.45		0.44		0.44	
F stat.	61.87		62.32		64.62		61.98		62.39		64.75	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.15a and table 4.18a

The above table 4.19c presents the results of industry fixed effect for model 13 to model 18, where Automobile and parts industry is used as reference industry. The results show that the chemical industry, the house hold goods industry, the industrial Engineering industry, the pharma and Bio industry, the tobacco industry and Travel and leisure industry have a significantly different intercepts in model 13 to model 18 and the Fixed Line industry has different intercept in model 14. The Chemical industry has intercept value of “0.10 to 0.11”, House hold goods industry has intercept value of “0.13 to 0.14”, Industrial Engineering industry has intercept of “0.05 to 0.07” Pharma and Bio industry has intercept of “0.17 to 0.18”,Tobacco industry has intercept of “0.28 to 0.31” and Fixed Line industry has an intercept of 0.05 which means that foreign investment is higher in chemical industry, house hold goods industry, industrial Engineering industry, pharma and Bio industry, Fixed Line industry and tobacco industry than Automobile and parts industry.

The Transportation and leisure industry has intercept of “-0.10 to -0.14” which means that foreign investment is lower for Transportation and leisure industry than Automobile and parts industry. The overall results of table 4.19c reflect that foreign investment is higher in chemical industry, house hold goods industry, industrial Engineering industry, pharma and Bio industry, Fixed Line industry and tobacco and lower in Transportation and leisure industry in comparison to Automobile and parts industry. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

The results for model 19 to model 24 for pool dummy variable analysis is presented in table 4.19d have the following econometric models:

Model 20

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 21

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 22

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 23

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 24

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 25

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.19d: Industry pool dummy regression with base industry of Automobile and Parts of foreign investment on information environment variables for the period of 2002 to 2012

	19		20		21		22		23		24	
	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.
Const.	-1.30	0.02	-1.11	0.05	-1.22	0.03	-0.21	0.18	-0.23	0.14	-0.19	0.21
Ins. Own.	0.44	0.00	0.46	0.00	0.44	0.00	0.44	0.00	0.46	0.00	0.44	0.00
Age	-0.01	0.10	-0.01	0.16	-0.01	0.09	-0.02	0.07	-0.01	0.12	-0.02	0.06
Trade cost	0.07	0.00	0.06	0.00	0.07	0.00	0.07	0.00	0.06	0.00	0.07	0.00
Size	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00
BTM	0.00	0.94	0.01	0.77	0.00	0.90	0.00	0.90	0.01	0.68	0.00	0.96
Vol.												
Turn. rate	-0.51	0.02	-0.59	0.01	-0.51	0.02	-0.47	0.03	-0.55	0.01	-0.47	0.03
Value traded												
Illiq.	0.19	0.11	0.16	0.18			0.17	0.21	0.04	0.77		
Zero Vol.	0.11	0.00			0.11	0.00	0.11	0.00			0.11	0.00
Daily Ret.												
Weekly Ret.	1.58	0.04	1.32	0.09	1.53	0.05						
Monthly Ret.												
Abs. Ret.							0.01	0.95	0.21	0.13	0.11	0.38
Chemicals	0.10	0.00	0.11	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.10	0.00
Construction and Materials	0.00	0.91	0.01	0.65	0.00	0.91	0.00	0.89	0.01	0.73	0.00	0.88
Electricity	-0.02	0.36	-0.02	0.32	-0.02	0.40	-0.03	0.29	-0.03	0.27	-0.02	0.32
Fixed Line Telecommunicatio	0.05	0.11	0.06	0.07	0.05	0.11	0.04	0.14	0.05	0.09	0.04	0.15
Food Producers	0.00	0.97	0.02	0.24	0.00	0.91	0.00	0.99	0.02	0.26	0.00	0.98
General Industries	-0.03	0.21	-0.01	0.59	-0.03	0.20	-0.03	0.22	-0.01	0.59	-0.03	0.22
Household Goods	0.13	0.00	0.14	0.00	0.13	0.00	0.13	0.00	0.14	0.00	0.13	0.00
Industrial Engineering	0.06	0.04	0.07	0.01	0.05	0.04	0.05	0.04	0.07	0.01	0.05	0.04
Oil and Gas	-0.01	0.78	0.00	0.88	-0.01	0.82	-0.01	0.74	0.00	0.97	-0.01	0.75
Personal Goods	-0.02	0.42	0.01	0.61	-0.02	0.45	-0.02	0.42	0.01	0.73	-0.02	0.43
Pharma and Bio	0.17	0.00	0.18	0.00	0.17	0.00	0.17	0.00	0.18	0.00	0.17	0.00
Tobacco	0.28	0.00	0.31	0.00	0.28	0.00	0.28	0.00	0.30	0.00	0.28	0.00
Travel and Leisure	-0.14	0.00	-0.10	0.00	-0.14	0.00	-0.14	0.00	-0.11	0.00	-0.14	0.00
Adj. R	0.45		0.44		0.45		0.44		0.44		0.44	
F stat.	62.15		62.54		64.92		61.79		62.49		64.64	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.15a and table 4.18a

The above table 4.19d presents the results of pool dummy variable analysis for model 19 to 24, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, House hold goods industry, Industrial Engineering industry, Pharma and Bio industry, Tobacco industry and Travel and Leisure industry have significantly different intercept in model 19 to model 24 and Fixed Line industry has different intercept in model 20. The Chemical industry have an intercept of “0.10 to 0.11” which means that foreign investment is higher for Chemical industry than Automobile and parts industry. The Fixed Line industry has an intercept of 0.06 which means that foreign investment is higher for Fixed Line industry than Automobile and parts industry. The house hold goods industry has an intercept of “0.13 to 0.14” which means that that foreign investment is higher for house hold goods industry than Automobile and parts industry.

The Industrial Engineering industry has an intercept of “0.05 to 0.07” which means that that foreign investment is higher for Industrial Engineering industry than Automobile and parts industry. The Pharma and Bio industry has an intercept of “0.17 to 0.18” which means foreign investment is higher for Pharma and Bio industry than Automobile and parts industry. The Tobacco industry has an intercept of “0.28 to 0.31” which means foreign investment is higher for Tobacco industry than Automobile and parts industry. The Transportation and leisure industry has an intercept of “-0.10 to -0.14” which means that foreign investment is lower for Transportation and leisure industry than Automobile and parts industry.

The overall results of table 4.19d reflect that foreign investment is higher in Chemical industry, House hold goods industry, Fixed Line industry, Industrial Engineering industry, Pharma and Bio industry, Tobacco industry and Travel and Leisure industry in comparison to Automobile and parts industry and foreign investment is lower in Transportation and leisure industry in comparison to Automobile and parts industry. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

The results for model 25 to model 30 for pool dummy variable analysis is presented in table 4.19e have the following econometric models:

Model 25

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 26

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 27

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 28

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 29

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 30

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.19e: Industry pool dummy regression with base industry of Automobile and Parts of foreign investment on information environment variables for the period of 2002 to 2012

	25		26		27		28		29		30	
	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.
Const.	-0.22	0.39	-0.13	0.61	-0.18	0.49	-0.22	0.27	-0.15	0.45	-0.19	0.33
Ins. Own.	0.44	0.00	0.44	0.00	0.43	0.00	0.44	0.00	0.44	0.00	0.43	0.00
Age	-0.02	0.04	-0.02	0.05	-0.02	0.04	-0.02	0.06	-0.02	0.06	-0.02	0.05
Trade cost	0.07	0.00	0.06	0.00	0.07	0.00	0.07	0.00	0.06	0.00	0.07	0.00
Size	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00
BTM	0.00	0.98	0.00	0.96	0.00	0.90	0.00	0.96	0.00	0.98	0.00	0.89
Vol.												
Turn. rate												
Value traded	-0.01	0.00	-0.02	0.00	-0.01	0.00	-0.01	0.00	-0.02	0.00	-0.01	0.00
Illiq.	0.10	0.41	0.05	0.64			0.09	0.44	0.05	0.66		
Zero Vol.	0.07	0.00			0.07	0.00	0.07	0.00			0.07	0.00
Daily Ret.	0.24	0.42	0.17	0.58	0.21	0.49						
Weekly Ret.												
Monthly Ret.							0.23	0.19	0.19	0.28	0.22	0.20
Abs. Ret.												
Chemicals	0.11	0.00	0.12	0.00	0.11	0.00	0.11	0.00	0.12	0.00	0.11	0.00
Construction and Materials	0.00	0.99	0.01	0.76	0.00	0.99	0.00	0.95	0.01	0.71	0.00	0.95
Electricity	-0.02	0.38	-0.02	0.39	-0.02	0.40	-0.02	0.44	-0.02	0.43	-0.02	0.46
Fixed Line Telecommunicatio	0.05	0.12	0.05	0.08	0.05	0.11	0.05	0.10	0.06	0.07	0.05	0.10
Food Producers	-0.01	0.78	0.00	0.82	-0.01	0.74	-0.01	0.77	0.00	0.82	-0.01	0.74
General Industries	-0.03	0.22	-0.02	0.38	-0.03	0.21	-0.03	0.23	-0.02	0.39	-0.03	0.22
Household Goods	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00	0.15	0.00	0.14	0.00
Industrial Engineering	0.05	0.04	0.06	0.02	0.05	0.04	0.05	0.04	0.06	0.02	0.05	0.04
Oil and Gas	0.01	0.68	0.02	0.41	0.01	0.65	0.01	0.65	0.02	0.38	0.01	0.62
Personal Goods	-0.02	0.35	-0.01	0.74	-0.02	0.36	-0.02	0.36	-0.01	0.77	-0.02	0.37
Pharma and Bio	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00
Tobacco	0.28	0.00	0.29	0.00	0.28	0.00	0.27	0.00	0.28	0.00	0.27	0.00
Travel and Leisure	-0.15	0.00	-0.14	0.00	-0.15	0.00	-0.15	0.00	-0.14	0.00	-0.15	0.00
Adj. R	0.45		0.45		0.45		0.45		0.45		0.45	
F stat.	63.59		65.86		66.60		63.68		65.93		66.70	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.15a and table 4.18a

The above table 4.19e presents the results of industry fixed effect for model 25 to model 30, where Automobile and parts industry is used as reference industry. The results show that the chemical industry, the house hold goods industry, the industrial Engineering industry, the pharma and Bio industry, the tobacco industry and Travel and leisure industry have a significantly different intercepts in model 25 to model 30.

The Chemical industry has intercept value of "0.11 to 0.12", House hold goods industry has intercept value of "0.14 to 0.15", Industrial Engineering industry has intercept of "0.05 to 0.06" Pharma and Bio industry has intercept of 0.16 and Tobacco industry has intercept of "0.27 to 0.29" which means that foreign investment is higher in chemical industry, house hold goods industry, industrial Engineering industry, pharma and Bio industry and tobacco industry than Automobile and parts industry. The Transportation and leisure industry has intercept of "-0.14 to -0.15" which means that foreign investment is lower for Transportation and leisure industry than Automobile and parts industry.

The overall results of table 4.19c reflect that foreign investment is higher in chemical industry, house hold goods industry, industrial Engineering industry, pharma and Bio industry and tobacco industry and lower in Transportation and leisure industry in comparison to Automobile and parts industry. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

The results for model 31 to model 36 for pool dummy variable analysis is presented in table 4.19f have the following econometric models:

Model 31

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 32

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 33

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 34

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 35

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Model 36

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

Table 4.19f: Industry pool dummy regression with base industry of Automobile and Parts of foreign investment on information environment variables for the period of 2002 to 2012

	31		32		33		34		35		36	
	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.	Coeff	Prob.
Const.	-1.06	0.05	-0.92	0.10	-1.01	0.06	-0.07	0.67	-0.04	0.78	-0.06	0.69
Ins. Own.	0.44	0.00	0.45	0.00	0.44	0.00	0.44	0.00	0.44	0.00	0.44	0.00
Age	-0.02	0.06	-0.02	0.07	-0.02	0.06	-0.02	0.04	-0.02	0.05	-0.02	0.04
Trade cost	0.07	0.00	0.06	0.00	0.07	0.00	0.07	0.00	0.06	0.00	0.07	0.00
Size	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00
BTM	0.00	0.95	0.00	0.99	-0.01	0.87	0.00	0.97	0.00	0.89	0.00	0.99
Vol.												
Turn. rate												
Value traded	-0.01	0.00	-0.02	0.00	-0.01	0.00	-0.01	0.00	-0.02	0.00	-0.01	0.00
Illiq.	0.09	0.43	0.05	0.65			0.03	0.82	-0.06	0.65		
Zero Vol.	0.07	0.00			0.07	0.00	0.06	0.01			0.06	0.01
Daily Ret.												
Weekly Ret.	1.44	0.06	1.30	0.09	1.42	0.06						
Monthly Ret.												
Abs. Ret.							0.10	0.50	0.21	0.13	0.11	0.34
Chemicals	0.11	0.00	0.12	0.00	0.11	0.00	0.11	0.00	0.11	0.00	0.11	0.00
Construction and Materials	0.00	0.98	0.01	0.73	0.00	0.98	0.00	0.99	0.01	0.81	0.00	0.99
Electricity	-0.02	0.45	-0.02	0.45	-0.02	0.48	-0.02	0.38	-0.02	0.38	-0.02	0.38
Fixed Line Telecommunicatio	0.05	0.09	0.06	0.06	0.05	0.09	0.05	0.12	0.05	0.09	0.05	0.12
Food Producers	-0.01	0.76	0.00	0.83	-0.01	0.72	-0.01	0.80	0.00	0.85	-0.01	0.79
General Industries	-0.03	0.22	-0.02	0.38	-0.03	0.21	-0.03	0.23	-0.02	0.38	-0.03	0.23
Household Goods	0.14	0.00	0.15	0.00	0.14	0.00	0.14	0.00	0.14	0.00	0.14	0.00
Industrial Engineering	0.05	0.04	0.06	0.02	0.05	0.04	0.05	0.04	0.06	0.03	0.05	0.04
Oil and Gas	0.01	0.65	0.02	0.38	0.01	0.62	0.01	0.68	0.02	0.45	0.01	0.68
Personal Goods	-0.02	0.36	-0.01	0.77	-0.02	0.37	-0.02	0.35	-0.01	0.65	-0.02	0.35
Pharma and Bio Tech	0.16	0.00	0.17	0.00	0.16	0.00	0.16	0.00	0.16	0.00	0.16	0.00
Tobacco	0.27	0.00	0.28	0.00	0.27	0.00	0.27	0.00	0.28	0.00	0.27	0.00
Travel and Leisure	-0.15	0.00	-0.14	0.00	-0.15	0.00	-0.15	0.00	-0.14	0.00	-0.16	0.00
Adj. R	0.45		0.45		0.45		0.45		0.45		0.45	
F stat.	63.84		66.08		66.86		63.57		66.03		66.64	
F Sig.	0.00		0.00		0.00		0.00		0.00		0.00	

Note: All variables are the same as defined in table 4.15a and table 4.18a

The above table 4.19f presents the results of pool dummy variable analysis for model 31 to 36, where Automobile and parts industry is used as reference industry. The results show that Chemical industry, House hold goods industry, Industrial Engineering industry, Pharma and Bio industry, Tobacco industry and Travel and Leisure industry have significantly different intercept in model 31 to model 36 and Fixed Line industry has different intercept in model 31 to model 35 except model 34 and model 36.

The Chemical industry have an intercept of “0.11 to 0.12” which means that foreign investment is higher for Chemical industry than Automobile and parts industry. The Fixed Line industry has an intercept of “0.05 to0.06” which means that foreign investment is higher for Fixed Line industry than Automobile and parts industry. The house hold goods industry has an intercept of “0.14 to 0.15” which means that that foreign investment is higher for house hold goods industry than Automobile and parts industry. The Industrial Engineering industry has an intercept of “0.05 to 0.06” which means that that foreign investment is higher for Industrial Engineering industry than Automobile and parts industry. The Pharma and Bio industry has an intercept of “0.16 to 0.17” which means foreign investment is higher for Pharma and Bio industry than Automobile and parts industry.

The Tobacco industry has an intercept of “0.27 to 0.28” which means foreign investment is higher for Tobacco industry than Automobile and parts industry. The Transportation and leisure industry has an intercept of “-0.14 to -0.16” which means that foreign investment is lower for Transportation and leisure industry than Automobile and parts industry. The overall results of table 4.19f reflect that foreign investment is higher in Chemical industry, House hold goods industry, Fixed Line industry, Industrial Engineering industry, Pharma and Bio industry, Tobacco industry and Travel and Leisure industry in comparison to Automobile and parts industry and foreign investment is lower in Transportation and leisure industry in comparison to Automobile and parts industry. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

Overall results of Table 4.19 presents pool dummy variable analysis, where Automobile and parts industry is used as reference industry. The result shows that Chemical industry, Household goods industry, Industrial Engineering industry, Pharma and Bio industry, Fixed Line Industry Tobacco and Transportation and leisure industry have significantly different intercept value. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

4.3.4 Discussion of Regression of foreign investment on information environment variables

Results of table 4.18 indicate that Institutional ownership, age, trading cost, size, liquidity and illiquidity are statistically different from zero. As suggested by Dahlquist and Robertsson (2001) and Huberman (2001) that investors prefer those firms, which are well known and with they are more familiar and institutional ownership has also significant positive impact in Pakistani equity market. Dasgupta et. al. (2010) has suggested that large firms reveal trends of macro-economic information and size has also significant positive impact in Pakistani equity market. But, the association between trading activities including trading cost and liquidity with foreign investment is found negative and percentage of zero volume is positive. The results of this study contradict the results of Ferreira and Matos (2008), Dahlquist and Robertsson (2001) and Bushee et al. (2010), and report negative association between trading activities and foreign investment. It might be the effect of herding and unrelated firm specific variables in emerging markets; the stocks are not in lined with trading mechanism rather linked with noise trading activities. The coefficient estimates of book to market ratio and returns are insignificant in overall regressions.

It has been discussed earlier that in poor economies stock price are move together rather than rich economies, due to the corporate governance practices, institutional regulations and less enforced practices to implement of all laws. The behavior of Pakistani equity market has also discussed in detail. According to the report of SEC Pakistan about stock market crisis 2008, market mechanisms have negative effects for the market and confidence of investors, especially foreign investors. This report further indicates that the global stock market crisis 2008 have negative impact on account of reduction in exports, decline in foreign investment, fall in portfolio investment, drop in remittances and difficulties in accessing financing from the developed countries. The findings of this study suggest that the difference firm specific variable is due to poor information environment in Pakistani equity market.

Table 4.19 presents the results of pool dummy variable analysis, where Automobile and parts industry is used as reference industry. The result shows that Chemical industry, Household goods industry, Industrial Engineering industry, Pharma and Bio industry, Fixed Line Industry Tobacco and Transportation and leisure industry have significantly different intercept value. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry. On the basis of regression analysis, Hypothesis 23 is rejected. All other hypothesis of this section are accepted.

4.4 Results of market premium, size premium, value premium and information premium

Section 4.4 reports the results of single factor CAPM based on market premium, three factor model based on market premium, size premium and value premium and four factor model based on market premium, size premium, value premium and information efficiency premium for sample period from 2002 to 2012.

4.4.1 Descriptive statistics of monthly returns of stylized portfolios

Descriptive statistics are presented in table 4.20 for monthly returns of portfolios constructed on the basis of size, BTM ratio and R square for 152 stocks for the period of 2002 to 2012.

Table 4.20: Descriptive statistics of monthly returns of stylized portfolios 2002 to 2012

Portfolio	Mean	Standard Deviation	Kurtosis	Skewness	Minimum	Maximum
P	0.005	0.063	0.299	-0.286	-0.189	0.151
S	0.006	0.072	0.309	0.116	-0.183	0.187
B	0.004	0.067	0.868	-0.449	-0.226	0.193
S/H	0.011	0.073	0.183	0.034	-0.184	0.196
S/L	0.001	0.076	0.480	0.180	-0.226	0.210
B/H	0.003	0.074	1.034	-0.431	-0.270	0.211
B/L	0.005	0.063	0.920	-0.415	-0.220	0.175
S/H/HR	0.015	0.084	0.817	0.046	-0.237	0.239
S/H/LR	0.006	0.074	0.797	-0.138	-0.266	0.203
S/L/HR	0.002	0.083	0.624	0.066	-0.213	0.242
S/L/LR	0.001	0.082	0.828	0.003	-0.245	0.232
B/H/HR	0.002	0.093	2.587	-0.318	-0.384	0.318
B/H/LR	0.004	0.064	0.048	-0.341	-0.186	0.153
B/L/HR	0.005	0.084	3.531	-0.650	-0.384	0.293
B/L/LR	0.006	0.058	0.882	-0.365	-0.186	0.184
Rm-Rf	0.010	0.087	6.228	-1.249	-0.460	0.236
SMB	0.002	0.049	2.197	-0.441	-0.214	0.120
HML	0.004	0.027	-0.107	0.204	-0.052	0.078
IEP	0.002	0.045	7.027	0.663	-0.186	0.233

Note: : *P is the portfolio consists of all 152 stocks; S portfolio consists of those stocks having low market capitalization; B portfolio consists of those stocks having large market capitalization; S/H portfolio consists of those small stocks having high BTM ratio; S/L portfolio consists of those small stocks having low BTM ratio; B/H portfolio consists of those big stocks having high BTM ratio; B/L portfolio consists of those big stocks having low BTM ratio; S/H/HR portfolio consists of those small stocks having high BTM ratio and high R square and S/H/LR portfolio consists of those small stocks having high BTM ratio and low R square; S/L/HR portfolio consists of those small stocks having low BTM ratio and high R square and S/L/LR portfolio consists of those small stocks having low BTM ratio and low R square; B/H/HR portfolio consists of those big stocks having high BTM ratio and high R square; B/H/LR portfolio consists of those big stocks having high BTM ratio and low R square; B/L/HR portfolio consists of those big stocks having low BTM ratio; high R square and B/L/LR portfolio consists of those big stocks having low BTM ratio and low R square; SMB, small minus big; HML, high minus low; IEP, High R Square minus Low R square and Rm-Rf, return to the market portfolio minus risk-free rate..*

Results presented in table 4.20 indicates that small stocks portfolio provides high return at high risk level as compare to big stocks portfolio (B) provides low return at low risk level that are aligned with the empirical work on size effect (Banz, 1981). It is also found that BTM ratio results are also in line with the results of Stattman (1980) that stock with small size and high BTM ratio (S/H) earn higher return than stocks with small size and low BTM ratio (S/L). That confirms the hypothesis of value stocks have more returns than growth stocks. After sorting on the basis of BTM ratio, portfolios are further divided on the basis of R square. Results shows that returns of low R square stocks from big size and high BTM ratio (B/H/LR) and returns of low R square stocks from big size and low BTM ratio (B/L/LR) have more returns that those stocks having high R square from big size and high BTM ratio (B/H/HR) and having high R square from big size and low BTM ratio (B/L/HR). West (1988) argued that stocks with low market model R square have low analyst coverage, age, institutional holding higher transaction cost and more volatile. Thus low R square stocks are risker stocks and should have to provide more return than these stocks having high R square stock.

Whereas, some portfolios results are contrary, for example(B/H) stocks are riskier and providing less returns and (B/L) are less risky providing high return. Along with these results, returns of small size portfolios that are further sub divided portfolios on the basis of R square are not evident of West (1988) hypothesis. It is observed that small size, high BTM ratio and low R square (S/H/LR) stocks and stocks with small size, low BTM ratio and low R square (S/L/LR) have less returns that those stocks having high R square from small size, high BTM ratio and high R square (S/H/HR) and stocks with small size, low BTM ratio and high R square (S/L/HR). Reasons of this behavior might be the ups and down of the KSE during this period. The one declaration of KSE as the most liquid and biggest stock exchange in the world during 2002 and index reached at the ever highest point in 2007 as well as in this period market was crashed in 2008.

4.4.2 First pass regression

First pass regression results of CAPM, three factor Fama and French (1992) and four factor model for low R square sorted portfolios from 2002 to 2012 are presented in table 4.21.

Table 4.21: Regression Analysis of low R square portfolio from 2002 to 2012

$R_{it} - R_{ft} = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 IEP_t + e_t$												
	S/H/ LR	**S/H/ LR**	**S/H/ LR**	**S/L/ LR**	**S/L/ LR**	**S/L/ LR**	**B/H/ LR**	**B/H/ LR**	**B/H/ LR**	**B/L/ LR**	**B/L/ LR**	**B/L/ LR**
a	0.003	-0.005	-0.005	-0.002	-0.006	-0.007	-0.001	-0.004	-0.004	0.001	0.001	0.001
T value	0.458	-1.384	-1.766	-0.364	-1.851	-2.034	-0.207	-0.961	-1.058	0.268	0.326	0.244
β_1	0.368	0.592	0.761	0.339	0.683	0.783	0.514	0.561	0.645	0.437	0.481	0.581
T value	5.474	13.638	16.279	4.381	16.243	15.801	10.968	11.715	11.212	9.920	10.182	10.327
β_2		1.097	0.938		1.421	1.328		0.272	0.193		0.161	0.068
T value		14.471	13.181		19.350	17.614		3.252	2.200		1.955	0.800
β_3		0.804	0.835		-0.627	-0.609		0.480	0.495		-0.253	-0.235
T value		6.192	7.315		-4.983	-5.040		3.353	3.529		-1.791	-1.716
β_4			-0.601			-0.353			-0.300			-0.353
T value			-6.252			-3.473			-2.537			-3.051
Adj. R 2	0.18	0.72	0.78	0.12	0.78	0.80	0.48	0.55	0.56	0.43	0.45	0.48
F stat	29.97	110.63	117.43	19.19	159.90	133.30	120.30	53.33	43.30	98.41	36.46	31.45
F sig	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: S/H/LR portfolio consists of those small stocks having high BTM ratio and low R square; S/L/LR portfolio consists of those small stocks having low BTM ratio and low R square; B/H/LR portfolio consists of those big stocks having high BTM ratio and low R square; B/L/LR portfolio consists of those big stocks having low BTM ratio and low R square; a, a-coefficient; β_1, β_1-coefficient; β_2, β_2-coefficient; β_3, β_3-coefficient; β_4, β_4-coefficient Adj. R^2, Adjusted R square; F stat., F statistics ; F sig., F significance.

Table 4.21 reports the results of single factor CAPM based on market premium, three factor model based on market premium, size premium and value premium and four factor model based on market premium, size premium, value premium and information efficiency premium for low R square portfolios. Results indicate that market premium and size premium is significant and positive for single factor, three factor and four factor model. It is also found that value premium is significant and positive for portfolio with high BTM ratio and significant and negative for portfolio with low BTM ratio. It shows that high BTM ratio stocks earn more return than low BTM ratio stocks.

Whereas, information efficiency premium is found significant and negative for low R square stocks. Results suggest that prevision of public and private information is an increasing function and it is negatively associated with the equity return. These results are consistent with Lambert et al. (2012). Therefore, SMB, HML and IEP factor cannot be ignored for low R square stocks.

The explanatory power of four factor model based on information efficiency premium is higher than single factor model CAPM and three factor Fama and French (1992) model. However, CAPM results shows that market premium is significant and positively related to all portfolios returns and the intercept is found insignificant. It is also observed that CAPM is a valid model for explaining the results of low R square stocks. CAPM does not capture precise information regarding firm specific factors so, its explanatory power is lower which is in line with low SPS. The missing information can be captured by using premium associated with difference of SPS.

First pass regression results of CAPM, three factor Fama and French (1992) and four factor model for high R square sorted portfolios from 2002 to 2012 presented in table 4.22.

Table 4.22: Regression Analysis of High R square portfolio from 2002 to 2012

$$R_{it} - R_{ft} = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 IEP_t + e_t$$

	S/H/ HR	**S/H/ HR**	**S/H/ HR**	**S/L/ HR**	**S/L/ HR**	**S/L/ HR**	**B/H/ HR**	**B/H/ HR**	**B/H/ HR**	**B/L/ HR**	**B/L/ HR**	**B/L/ HR**
a	0.009	0.002	0.003	-0.004	-0.007	-0.006	-0.007	-0.009	-0.009	-0.005	-0.004	-0.003
T value	1.548	0.533	0.837	-0.801	-1.518	-1.492	-2.098	-2.626	-2.727	-1.519	-1.267	-1.251
β_1	0.564	0.775	0.558	0.620	0.832	0.668	0.964	0.954	0.806	0.887	0.886	0.738
T value	8.132	15.162	10.413	9.637	15.414	10.839	23.495	22.024	16.661	25.480	23.265	17.931
β_2		1.036	1.239		0.870	1.022		0.019	0.157		-0.028	0.109
T value		11.603	15.201		9.227	10.889		0.245	2.130		-0.427	1.741
β_3		0.775	0.735		-0.446	-0.475		0.447	0.420		-0.168	-0.195
T value		5.059	5.625		-2.760	-3.159		3.447	3.562		-1.473	-1.936
β_4			0.770			0.578			0.524			0.522
T value			6.995			4.562			5.280			6.169
Adj. R 2	0.33	0.70	0.78	0.41	0.65	0.70	0.81	0.82	0.85	0.83	0.83	0.87
F stat	66.13	101.62	116.98	92.88	83.83	77.80	552.01	202.02	190.30	649.23	217.75	220.10
F sig	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: S/H/HR portfolio consists of those small stocks having high BTM ratio and high R square; S/L/HR portfolio consists of those small stocks having low BTM ratio and high R square; a, a-coefficient; β_1, β_1-coefficient; β_2, β_2-coefficient; β_3, β_3-coefficient; β_4, β_4-coefficient Adj. R^2, Adjusted R square; F stat., F statistics; F sig., F significance.

Table 4.22 reports the results of single factor CAPM based on market premium, three factor model based on market premium, size premium and value premium and four factor model based on market premium, size premium, value premium and information efficiency premium for high R square portfolios. Results indicate that market premium, size premium and information efficiency premium is significant and positive for in single factor, three factor and four factor model. It is also found that value premium is significant and positive for portfolio having high BTM ratio and significant and negative for portfolio having low BTM ratio. The behavior of value premium and stock returns is same for low R square portfolios and results of Table 4.21 and Table 4.22 are consistent. It shows that high BTM ratio stocks earn more return than low BTM ratio stocks. Size and value premium results are in line with the previous study of Hassan and Javed (2011). Therefore, SMB, HML and IEP factor cannot be ignored for low R square stocks also.

The explanatory power of four factor model based on information efficiency premium is higher than single factor model CAPM and three factor Fama and French (1992) model. However, CAPM results shows that market premium is significant and positively related to all portfolios returns and the intercept is found insignificant. It is also observed that CAPM is still a valid model for explaining the results of low R square stocks.

An overall result of first pass regression shows that traditional CAPM is a valid model for Pakistani equity market. It is also found that size premium, value premium and information efficiency premium have significant effect on overall portfolios. It is evident that three factor and four factor model raise adjusted R square which explains the model better than the single factor CAPM based on market premium. Therefore, it can be concluded that size, value premium and information efficiency premium exists in Pakistani equity market and investor should consider these three factors while devising their investment strategies.

4.4.3 Second pass regression for sample period

Second pass Fama and Macbeth (1973) regression results of three factor and four factor model for overall portfolio from 2002 to 2012 presented in table 4.23.

Table 4.23: Regression Analysis of past Betas on all portfolios from 2002 to 2012

	$R_{it} - R_{ft} = \alpha + \lambda_1\beta_{1i} MKT_i + \lambda_2 \beta_{2i} SMB_i + \lambda_3 \beta_{3i} HML_i + \lambda_4 \beta_{4i} IEP_i + e_i$						
	a	λ_1	λ_2	λ_3	λ_4	Adj. R 2	F stat
coefficient	0.022	-0.028	0.002	0.004		0.652	5.367
T value	2.976	-2.600	1.163	2.537			
coefficient	0.021	-0.026	0.002	0.005	0.002	0.626	3.932
T value	2.686	-2.349	1.094	2.477	0.853		

Note: a, a-coefficient; λ_1, λ_1-coefficient; λ_2, λ_2-coefficient; λ_3, λ_3-coefficient; λ_4, λ_4-coefficient Adj. R^2, Adjusted R square; F stat., F statistics ; F sig., F significance.

Table 4.23 presents the results of cross-sectional Fama and Macbeth (1973) second pass regression. Average portfolio returns are regressed on factor loading estimated for first pass regression (market premium, size premium, value premium and information efficiency premium). Results of three factor and four factor model indicate that market beta and HML beta can explain portfolio returns. Whereas, factor loadings with SMB beta and IEP beta are insignificant indicating that these are not priced during the sample period.

4.4.4 Discussion of First pass regression and second pass regression results:

Table 4.21 and table 4.22 report the results of single factor CAPM based on market premium, three factor model based on market premium, size premium and value premium and four factor model market premium, size premium, value premium and information efficiency for high R square and low R square portfolios. Results indicate that market premium, size premium and information efficiency is significant and positive for in single factor, three factor and four factor model. It is also found that value premium is significant and positive for portfolio having high BTM ratio and significant and negative for portfolio having low BTM ratio. It shows that high BTM ratio stocks earn more return than low BTM ratio stocks.

Value premium results are in line with Stattman (1980), Rosenberg at el. (1985), Fama and French (1993) and Hassan and Javed (2011) that value premium is significant and positive for high BTM ratio portfolios. Whereas, value premium is found significant and negative for low BTM ratio. Peterkort and Nielsen (2005) report that BTM ratio has inverse relationship with stock returns and portfolio returns of the firms with negative book value. Roll (1988) argues that stock prices capture firm as well as market information to drive the stocks in same or opposite direction.

Results of low SPS stocks are consistent with Lambert et al. (2012), who suggest that prevision of public and private information is an increasing function and it is negatively associated with the cost of equity. High quality disclosure has more precision of information in stock prices and decease cost of equity (Francis et al., 2005). Farooq and Ahmed (2015) argue that SPS is an increasing function of governance environment of a firm and better governance mechanism reveal higher SPS. Findings of high SPS stocks are in line with this argument. Therefore, information premium is present in the market.

The empirical results also documented that Fama and Macbeth (1973) second pass regression found that past betas can explain current returns. It is evident that three factor and four factor model raise adjusted R square which explains the model better than the single factor CAPM based on market premium. Therefore, it can be concluded that information efficiency and value premium exists in and emerging market and investor should consider these two factors while devising their investment strategies.

Overall findings of this study suggest that Pakistani stock market is not weak form efficient. The investors have an opportunity to get benefit from the predictable behavior of the market. In second step this study has identified different firm specific variables that disseminate information and these variables have significant impact on SPS. Then it is observed that SPS premium is priced by the market and market considers it as systematic risk. In last step it is found that due to the increase or decrease in the synchronicity the firm specific variables have an impact on foreign investment.

Chapter 5
5. Conclusion and Implications of the study

5.1 Conclusion

The first purpose of this study is to examine the weak from of efficiency in Pakistani stock market for the period of 2002 to 2012 by using daily, weekly and monthly returns. If the changes in series, follow normal distribution pattern then it is called random. To test normality of data Jarque-Bera and KS test is used and result reveals that daily, weekly and monthly returns are not normally distributed. Therefore, results suggest that there is a predictability element for returns. A return series is called random if there is no autocorrelation exists. Then autocorrelation and Run test is used for autocorrelation coefficient. The results of autocorrelation functions and Q-Ljung box statistics and confirm that there exist autocorrelation in daily and weekly returns. So, it can be said that daily and weekly returns Pakistani market does not follow random walk, but for monthly returns no correlation exists at any lag.

Run test also confirms the same results of autocorrelation for daily, weekly and monthly returns series. This study also tests stationarity of the financial time series by using unit root tests. A necessary condition for random walk is that a financial time series should be non-stationary. ADF and Phillips-Perron are used for unit root, both tests report that daily, weekly and monthly returns are stationary at level. Finally, MVR ratio test is used with both assumptions of heteroscesdicity as well as homoscesdicity. The results of MVR test reveal that series does not follow random walk. These results are consistent with Kamal and Rehman (2006), Hassan et al. (2007) and Hamid et al. (2010). Therefore, it is concluded that investors have an opportunity to get benefit from the predictable behavior of this market.

The second purpose of this study is to examine the relationship between SPS and information environment variables in Pakistani equity market by using 152 stocks for the period of 2002 to 2012. Age has statistically significant and negative relationship with SPS, size has statistically significant and positive relationship with SPS, BTM ratio is statistically significant and positive for high SPS stocks, Trading cost have mixed findings with SPS, Volume, turnover rate and value traded are statistically significant and positive relationship with SPS, Amihud illiquidity has a significant and positive relationship with SPS and All return measure except absolute returns have significant and negative relationship with SPS. Findings of this study are in line with West (1988) and Lettau Malkiel and Xu (2001), who suggest that the differences in idiosyncratic return volatility are not linked with the better or less quality of information incorporation of firm specific variable and more linked with noise in returns.

In case of overall results age has insignificant results, but only higher SPS portfolios results are consistent with Dasgupta et al. (2010) that age has statistically significant and negative relationship with SPS reflecting time variant information. They suggest that old firms have richer information environment and should have to increase stock return variation and reduce SPS. Dasgupta et. al. (2010) suggest that large firms reveal trends of macro-economic information and the price behavior of these firms induce similar market movements and resulted to increase SPS. Attention of traders as measure by size has statistically significant and positive relationship with SPS in overall results. Results are in line with the results of Piotroski and Roulston (2004), Chan and Hameed(2006), Ashbaugh-Skaife et al. (2006) and Kelly (2007).

Liquidity measures have statistically significant and positive relationship with SPS in overall results. Grossman and Stiglitz (1980) suggest that high liquidity facilitate informed based trading. So, an information environment based analysis should have to report an increase in idiosyncratic volatility and result in reducing SPS. So, the association between trading activities and SPS would be negative. However, if one assumes that SPS using R square is a proxy of noise trading and unrelated to firm specific variables, then the association of trading activity is expected to be positive with SPS (Ashbaugh-Skaife et al., 2006).

Overall results of illiquidity measures of non-trading activity should have to decrease idiosyncratic volatility and result to increase in SPS. The results of Amihud illiquidity are consistent and report a significant and positive relationship with SPS. But percentage of zero volume illiquidity has a significant and negative relationship with SPS. As suggested by Ashbaugh-Skaife et al. (2006) that infrequent trading with small amounts and non-information based trading slightly immaterial trades. That results in unrelated firm specific information and lower SPS. All return measure except absolute returns have significant and negative relationship with SPS. Because, movement in stock returns is a trading activity that generates fluctuation in firm specific return and decrease SPS. The coefficients of absolute returns are negative. This result is most likely due to construction of the variable, which are the absolute values.

Pool dummy variable analysis is also concluded that, where Automobile and parts industry is used as reference industry. The result shows that Chemical industry, Fixed Line industry and Oil and Gas and Construction and Material industry have a significantly different intercept value. The overall results of table 4.15 reflect that firm specific variables can explain more variations in auto part industry than chemical industry, Fixed Line industry, Oil and Gas industry and Construction and Material industry. All other industries have statistically insignificant values, which mean there is no difference in SPS in comparison to Automobile and parts industry.

Pool dummy variable analysis is also conducted with reference to low and high R square portfolios and portfolio 1 (lowest R square stocks portfolio) is used as reference portfolio. The result shows that portfolio 7, portfolio 8, portfolio 9 and portfolio 10 have a significantly different intercept value. The overall results of table 4.16 reflect that firm specific variables can explain more variations in portfolio 1 than portfolio 7, portfolio 8, portfolio 9 and portfolio 10 or there is more noise in portfolio 1 stocks than portfolio 7,portfolio 8, portfolio 9 and portfolio 10. All other portfolios have statistically insignificant values, which mean there is no difference in SPS in comparison to portfolio 1.

Results of this study indicate that Low SPS is resulted due to firm specific variables information incorporation in to stock prices for the stocks more synchronize with the market. In a higher quality of information environment, market model R square should be higher with large institutional holding, greater age, lower trading cost, large size, value stocks, low illiquidity, high liquidity and large information events. But, conversely Kelly (2007) argues that if R square results are due to noise traders' activities then results may deviate from the fundamentals. Grossman (1995) claims that more informed based trading can lead the stock prices away from the fair value (discounted present value) of cash flows, even in the presence of arbitragers. He suggests that informed traders are strongly associated with noise traders and counter balance the trade of noise traders. Alves et al. (2006) report Pakistan below the average for the implementation of corporate governance and investor protection regimes. it can be concluded that the difference in R square is not due to quality of information environment i.e., firm specific variable or due to informed based trading but elsewhere or poor information environment in Pakistani equity market.

Third purpose of this study is to examine the relationship between foreign ownership and information environment variables in Pakistani equity market for the period of 2002 to 2012. Results indicate that Institutional ownership, age, trading cost, size, liquidity and illiquidity are related to foreign ownership. Institutional ownership has significant and positive relationship with foreign ownership. Institutional ownership results are in line with Dahlquist and Robertsson (2001) and Huberman (2001), who argue that investors prefer those firms, which are well known and with they are more familiar. Size has also significant and positive relationship with foreign investment in Pakistani equity market. As suggested by Dasgupta et. al. (2010) that large firms reveal trends of macro-economic information.

Almazan et al. (2005) argue that more liquid stocks are considered as greater information flows and have low information asymmetry, which suggest fund managers to better selection of stocks. The results of this study contradict the results of Ferreira and Matos (2008), Dahlquist and Robertsson (2001) and Bushee et al. (2010), and report negative association between trading activities and foreign investment. Percentage of zero volume has significant and positive relationship with foreign ownership. The contradicting results might be the effect of herding and unrelated firm specific variables in emerging markets; the stocks are not in line with trading mechanism rather linked with noise trading activities. The findings of this study suggest that the difference firm specific variable is due to poor information environment in Pakistani equity market. Results of pool dummy variable analysis, where Automobile and parts industry is used as reference industry, shows that Chemical industry, Household goods industry, Industrial Engineering industry, Pharma and Bio industry, Fixed Line Industry Tobacco and Transportation and leisure industry have significantly different intercept value. All other industries have statistically insignificant values, which mean there is no difference in foreign investment in comparison to Automobile and parts industry.

The fourth purpose of this study is to examine the relationship between beta and stock returns by using CAPM and multifactor models based on value premium and information efficiency premium in Pakistani equity market for the period of 2002 to 2012. This study employs Fama and Machbeth (1973) second pass regression methodology used in famous studies of Fama and French (1992, 1993). This is the first study that investigates the relationship of information efficiency premium by using R square. Small capitalization stocks earn high return than large capitalization stocks and high BTM ratio earn higher return than those stocks having low BTM ratio. Further results of R square sorted portfolios show that returns of low R square have more returns that those stocks having high R square. West (1988) argue that stocks with low market model R square have small size, low analyst coverage, age, institutional holding higher transaction cost and more volatile.

Results of single factor CAPM based on market premium, three factor model based on market premium, size premium and value premium and four factor model based on market premium, size premium, value premium and information efficiency premium indicate that MKT, SMB, HML and IEP factor is priced in Pakistani equity market. Regression results indicate that market premium, size premium and information efficiency is significant for single factor, three factor and four factor model. CAPM results shows that market premium is significant and positively related to all portfolios returns and the intercept is found insignificant. Three factor model and four factor model results shows that size premium is significant and positively related to all portfolios returns. It is also found that value premium is significant and positive for portfolio having high BTM ratio and significant and negative for portfolio having low BTM ratio.

The explanatory power of four factor model based on information efficiency premium is higher than single factor model CAPM and three factor Fama and French (1992) model. Size and value premium results are in line with the previous study of Hassan and Javed (2011). Therefore, SMB, HML and IEP factor cannot be ignored for low R square stocks also. Whereas, information efficiency premium is found significant and negative for low R square stocks. Results of low SPS stocks are consistent with Lambert et al. (2012), who suggest that prevision of public and private information is an increasing function and it is negatively associated with the cost of equity. Farooq and Ahmed (2014) argue that SPS is an increasing function of governance environment of a firm and better governance mechanism reveal higher SPS. Findings of high SPS stocks are in line with this argument. Therefore, information premium is present in the market.

Overall result of first pass regression shows that traditional CAPM is a valid model for Pakistani equity market. However, as discussed above, it does not capture prescribed information regarding firm specific factors and its explanatory power is lower. So the remaining information can be captured by using premium associated with difference of SPS. The empirical results also documented that Fama and Macbeth (1973) second pass regression report that past betas can explain current returns. It is evident that three factor and four factor model raise adjusted R square which explains the model better than the single factor CAPM based on market premium.

5.2 Implications of the study

Results of this study suggest that Pakistani stock market does not follow random walk pattern. This shows that investors can predict future prices by using technical analysis and devise better investment strategy at least in short run. The benefit of market timing may be taken by managers when taking decision regarding new equity issue.

Movements of prices of large companies synchronize with market so investor can use this information at the time of allocation of funds. Age, Book to market ratio and institutional investors have mixed evidences so that same must be considered with due vigilance as behavior varies for various R square sorted portfolios. Liquidity and SPS are positively correlated so it indicates that market environment plays significant role in price movement and liquidity trends can be used to foresee the behavior of stock with reference to market. Lack of trading is indication of deviant behavior from market. So, said risk be considered while making investment decision. Higher returns are aligned with market movements. So, behavior of market should be considered while selecting a stock for decision making.

Foreign investment is influence by institutional ownership so institutional preference in market will attract foreign investment. Therefore, a supportive environment for institutional investor must be provided. Investors should consider industry dynamics before making decision as information environment varies across industries. Cost of equity is very important for estimation of cost of capital which is used for evaluation of investment appraisal of projects. As proposed asset pricing model provides better estimation in comparison to conventional models. Therefore, use of said model will improve quality of decision and result in better allocation of funds. Policy makers should think about the implementation of such policies that will helpful for better information environment.

5.3 Direction for the future research

This study may propose following future directions

- As this study does not distinguish between periods of bullish or bearish market turbulence so the extreme volatility behavior should be considered for future research.

- As this study focuses only on the Pakistani equity market it would be useful to examine the same information environment attributes for other emerging markets, this would enable investors to distinguish unique changes for each country and general emerging market trends.

- For better information environment, corporate governance, difference in corporate finance structures and ownership structures are the other attributes that may also be used to explain SPS.

- As the volatility in stock prices is affected due to global economic conditions, it would be useful to conduct a study which distinguish firm specific variable in volatility from global trend

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Appendix A
A brief description of models explains SPS

Model 1

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(VT)_{it} + \beta_8 ln(Turnover\ rate)_{it} + \beta_9 ln(ill)_{it} + \beta_{10} ln(\%zero)_{it} + \beta_{11} ln(DR)_{it} + \beta_{12} ln(WR)_{it} + \beta_{13} ln(MR)_{it} + \beta_{14} ln(ABR)_{it} + \delta_{it}$$

The model uses all proxies of liquidity, all proxies of illiquidity and all proxies of returns.

Model 2

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(\%zero)_{it} + \beta_9 ln(DR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 3

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(DR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and daily returns as proxy of returns.

Model 4

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(\%zero)_{it} + \beta_8 ln(DR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 5

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(\%zero)_{it} + \beta_9 ln(WR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 6

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \, ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 \, ln\,(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(WR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and weekly returns as proxy of returns.

Model 7

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(\%zero)_{it} + \beta_8 ln(WR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 8

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(\%zero)_{it} + \beta_9 ln(MR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 9

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(MR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and monthly returns as proxy of returns.

Model 10

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(\%zero)_{it} + \beta_8 ln(MR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 11

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 12

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 13

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 14

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 15

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and daily returns as proxy of returns.

Model 16

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 17

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 18

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and weekly returns as proxy of returns.

Model 19

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 20

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 21

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} \\ + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}\end{aligned}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and monthly returns as proxy of returns.

Model 22

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} \\ + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}\end{aligned}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 23

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} \\ + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}\end{aligned}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 24

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} \\ + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}\end{aligned}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 25

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} \\ + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}\end{aligned}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 26

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} \\ + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \delta_{it}\end{aligned}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 27

$$\begin{aligned}SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} \\ + \beta_8 \ln(DR)_{it} + \delta_{it}\end{aligned}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and daily returns as proxy of returns.

Model 28

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 29

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 30

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and weekly returns as proxy of returns.

Model 31

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 32

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 33

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and monthly returns as proxy of returns.

Model 34

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 35

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 36

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 37

$$\text{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

A brief description of models of pool dummy variable analysis with base industry Automobile and Parts in explaining SPS

Model 1

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 2

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 3

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 4

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 5

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 6

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 7

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 8

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 9

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 10

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 11

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 12

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 13

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 14

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 15

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 16

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 17

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 18

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 19

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 20

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 21

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 22

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 23

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 24

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 25

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 26

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 27

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 28

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 29

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 30

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 31

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 32

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 33

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 34

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 35

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 36

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

A brief description of models of pool dummy variable analysis with lowest R square portfolio as base in explaining SPS

Model 1

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 2

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 3

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 4

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 5

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 6

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 7

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 8

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 9

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 10

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 11

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{Vol})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 12

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 13

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 14

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 15

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 16

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 17

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2 PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 18

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 19

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 20

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 21

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 22

$$\mathrm{SYNCH}_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{R}^2\mathrm{PD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 23

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 24

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Turnover\ rate)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

Model 25

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 26

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(DR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 27

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(DR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 28

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 29

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 30

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(WR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 31

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 32

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 33

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 34

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 35

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

Model 36

$$SYNCH_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(VT)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum R^2PD_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Lowest R-square portfolio as reference dummy.

A brief description of models explains foreign investment

Model 1

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(VT)_{it} + \beta_8 ln(Turnover\ rate)_{it} + \beta_9 ln(ill)_{it} + \beta_{10} ln(\%zero)_{it} + \beta_{11} ln(DR)_{it} + \beta_{12} ln(WR)_{it} + \beta_{13} ln(MR)_{it} + \beta_{14} ln(ABR)_{it} + \delta_{it}$$

The model uses all proxies of liquidity, all proxies of illiquidity and all proxies of returns.

Model 2

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(\%zero)_{it} + \beta_9 ln(DR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 3

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(DR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and daily returns as proxy of returns.

Model 4

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(\%zero)_{it} + \beta_8 ln(DR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 5

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(\%zero)_{it} + \beta_9 ln(WR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 6

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(WR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and weekly returns as proxy of returns.

Model 7

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(\%zero)_{it} + \beta_8 ln(WR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 8

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(\%zero)_{it} + \beta_9 ln(MR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 9

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(ill)_{it} + \beta_8 ln(MR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and monthly returns as proxy of returns.

Model 10

$$FI_{i,t} = \alpha_{it} + \beta_1 ln(Inst)_{it} + \beta_2 ln(Age)_{it} + \beta_3 ln(TC)_{it} + \beta_4 ln(Size)_{it} + \beta_5 ln(BTM)_{it} + \beta_6 ln(Vol)_{it} + \beta_7 ln(\%zero)_{it} + \beta_8 ln(MR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 11

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 12

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 13

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 14

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(DR)_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 15

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and daily returns as proxy of returns.

Model 16

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 17

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 18

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and weekly returns as proxy of returns.

Model 19

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 20

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 21

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and monthly returns as proxy of returns.

Model 22

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 23

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 24

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 25

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 26

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 27

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and daily returns as proxy of returns.

Model 28

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{DR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and daily returns as proxy of returns.

Model 29

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 30

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and weekly returns as proxy of returns.

Model 31

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{WR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and weekly returns as proxy of returns.

Model 32

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 33

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and monthly returns as proxy of returns.

Model 34

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{MR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and monthly returns as proxy of returns.

Model 35

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

Model 36

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity and absolute returns as proxy of returns.

Model 37

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity and absolute returns as proxy of returns.

A brief description of models of pool dummy variable analysis with base industry Automobile and Parts in explaining foreign invesment

Model 1

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Vol})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 2

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Vol})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 3

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Vol})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 4

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Vol})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{WR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 5

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Vol})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{WR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 6

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Vol})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{WR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 7

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 8

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 9

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_8 \ln(MR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 10

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_8 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 11

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(ill)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 12

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(Inst)_{it} + \beta_2 \ln(Age)_{it} + \beta_3 \ln(TC)_{it} + \beta_4 \ln(Size)_{it} + \beta_5 \ln(BTM)_{it} + \beta_6 \ln(Vol)_{it} + \beta_7 \ln(\%zero)_{it} + \beta_9 \ln(ABR)_{it} + \sum IndD_{it} + \delta_{it}$$

The model uses volume as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 13

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 14

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 15

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 16

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{WR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 17

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The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

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The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

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$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{MR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 22

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 23

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The model uses turnover rate as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 24

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{Turnover rate})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{ABR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses turnover rate as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 25

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 26

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 27

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\%\text{zero})_{it} + \beta_8 \ln(\text{DR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, daily returns as proxy of returns and Automobile and Parts industry as base industry.

Model 28

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\text{Inst})_{it} + \beta_2 \ln(\text{Age})_{it} + \beta_3 \ln(\text{TC})_{it} + \beta_4 \ln(\text{Size})_{it} + \beta_5 \ln(\text{BTM})_{it} + \beta_6 \ln(\text{VT})_{it} + \beta_7 \ln(\text{ill})_{it} + \beta_8 \ln(\%\text{zero})_{it} + \beta_9 \ln(\text{WR})_{it} + \sum \text{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 29

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 30

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{WR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, weekly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 31

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 32

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 33

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_8 \ln(\mathrm{MR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, monthly returns as proxy of returns and Automobile and Parts industry as base industry.

Model 34

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_8 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure and percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 35

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\mathrm{ill})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, Amihud measure as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Model 36

$$FI_{i,t} = \alpha_{it} + \beta_1 \ln(\mathrm{Inst})_{it} + \beta_2 \ln(\mathrm{Age})_{it} + \beta_3 \ln(\mathrm{TC})_{it} + \beta_4 \ln(\mathrm{Size})_{it} + \beta_5 \ln(\mathrm{BTM})_{it} + \beta_6 \ln(\mathrm{VT})_{it} + \beta_7 \ln(\%\mathrm{zero})_{it} + \beta_9 \ln(\mathrm{ABR})_{it} + \sum \mathrm{IndD}_{it} + \delta_{it}$$

The model uses value traded as proxy of liquidity, percentage of zero volume days as proxy of illiquidity, absolute returns as proxy of returns and Automobile and Parts industry as base industry.

Appendix B

List of industries

1	Automobile and Parts
2	Chemicals
3	Construction and Materials
4	Electricity
5	Fixed Line Telecommunication
6	Food Producers
7	General Industrials
8	Household Goods
9	Industrial Engineering
10	Oil and Gas
11	Personal Goods
12	Pharma and Bio Tech
13	Tobacco
14	Travel and Leisure

List of companies

1	AL- Abbas Sugar Mills Limited.	39	Dreamworld Ltd
2	Abbot Laboatories (Pakistan) Ltd.	40	Dewan Salman Fibre Limited.
3	Adam Sugar Mills Ltd.	41	Ellcot Spinning Mills Ltd.
4	Artistic Denim Mills Limited	42	Engro Corporation Ltd.
5	Agriautos Industries Limited.	43	Ferozsons Laboratories Ltd
6	AL-Ghazi Tractors Ltd.	44	Faran Sugar Mills Ltd.
7	Ahmed Hassan Textile Mills Ltd.	45	Fazal Cloth Mills Ltd .
8	Al-Noor Sugar Mills Ltd.	46	Gadoon Textile Mills Ltd.
9	Altern Energy Ltd..	47	Gammon Pakistan Ltd.
10	Apollo Textile Mills Ltd.	48	Gul Ahmed Textile Mills Ltd.
11	Atlas Battery Limited	49	Genertech Pakistan Limited
12	Atlas Honda Ltd.	50	Ghani Glass Mills Limited
13	Attock Refinery Ltd.	51	Ghandara Nissan Limited
14	Azam Textile Mills Limited.	52	Glaxosmithkline (Pak) Ltd.
15	Baba Farid Sugar Mills Limited	53	Gillette Pakistan Limited
16	Bata Pakistan Ltd.	54	Grays Of Combridge (Pakistan) Ltd.
17	Bawany Sugar Mills Ltd.	55	General Tyre and Rubber Co. of Pak. Ltd.
18	Babri Cotton Mills Ltd.	56	Gulistan Textile Mills Ltd.
19	Berger Paints Pakistan Ltd.	57	Gharibwal Cemant Ltd.
20	Biafo Industries Limited	58	Habib Sugar Mills Ltd.
21	Bilal Fibres Limited	59	Hajra Textile Mills Ltd.
22	Bannu Woollen Mills Limited	60	Highnoon Laboratories Limited
23	Burshane LPG (Pakistan) Limited	61	Hub Power Company Limited
24	Buxly Paints Ltd.	62	Haseeb Waqas Sugar Mills Limited
25	Bestway Cement Ltd	63	I.C.I Pakistan Ltd.
26	Chashma Sugar Mills Limited.	64	Idrees Textile Mills Limited
27	Cherat Cement Company Limited	65	Indus Dyeing Manufacturing Co. Ltd.
28	Crescent Jute Proudcts Ltd.	66	Indus Motor Company Limited
29	Clover Pakistan Limited.	67	International Industries Ltd.
30	Colgate Palmolive (Pakistan) Ltd.	68	Ismail Industries Ltd.
31	Clariant Pakistan Ltd	69	Janana-de-Malucho Textile Mills Ltd.
32	Crescent Textile Mills Ltd.	70	J. D. W. Sugar Mills Ltd.
33	Crescent Steel & Allied	71	Japan Power Generation Limited
34	Chakwal Spinning Mills Ltd.	72	Karachi Electric Supply Company Ltd.
35	Dedex Eternit Limited.	73	Khyber Tobacco Co. Ltd.
36	Dadabhoy Cement Industries Limited	74	Kohat Cement Limited
37	Din Textile Mills Limited	75	Kohinoor Energy Limited
38	Dandot Cement Company Ltd.	76	Kohinoor Power Company Limited.

77	Kohinoor Industries Ltd.	115	Pakistan State Oil Co. Ltd.
78	Kohinoor Spinning Mills Ltd.	116	Pakistan Synthetic Ltd.
79	Kohinoor Textile Mills Ltd.	117	Pakistan Telecommunication
80	Leather Up Industries Ltd.	118	Pakistan Telephone Cables Ltd.
81	Lucky Cement Limited	119	Ravi Textile Mills Ltd.
82	Mari Gas Company Limited	120	Reliance Cotton Spinning Mills Ltd.
83	Merit Packaging Ltd.	121	Redco Textiles Ltd.
84	Mitchell's Fruit Farms Limited	122	Rafhan Maize Products Ltd.
85	Mirpurkhas Sugar Mills Ltd.	123	Rupali Polyester Ltd.
86	Maple Leaf Cement Factory Limited	124	Saif Textile Mills Limited
87	Mehran Sugar Mills Limited	125	Sardar Chemical Industries Limited
88	Masood Textile Mills Ltd.	126	Southern Electric Company Limited
89	Millat Tractors Ltd.	127	Sapphire Fibers Ltd.
90	Murree Brewery Company Ltd	128	Shadman Cotton Mills Ltd.
91	Mirza Sugar Mills Limited.	129	Shell Pakistan Limited
92	Nagina Cotton Mills Ltd.	130	Shezan International Ltd.
93	Nestle Pakistan Ltd.	131	Shifa International Hospitals Limited
94	Nimir Ind.Chemicals	132	Shahmurad Sugar Mills Ltd.
95	Nishat Mills Ltd.	133	Siemens Pakistan Engineering Co. Ltd.
96	Noon Sugar Mills Ltd.	134	Singer Pakistan Limited
97	National Refinery Ltd.	135	Sitara Chemical Industries Ltd.
98	Otsuka Pakistan Limited.	136	Sana Industries Ltd.
99	Pak Elektron Ltd.	137	Sui Northern Gas Ltd.
100	Pak Datacom Limited	138	Sui Southern Gas Co. Ltd
101	Pakistan Tobacco Co. Ltd.	139	Saritow Spinning Mills Ltd.
102	Pakistan Gum and Chemiclas Ltd.	140	Shabbir Tiles and Ceramics Ltd.
103	Pakistan International Airlines Corp.	141	Shams Textile Mills Ltd.
104	Pioneer Cement Limited	142	Suraj Cotton Mills Ltd.
105	Packages Limited	143	Sunrays Tetile Mills Ltd.
106	Philip Morris (Pakistan) Ltd. (Formerly Lakson Tobacco)	144	Tata textile Mills Limited
107	Pakistan National Shipping Corporation	145	Telecard Limited
108	Pakistan Oilfields Ltd.	146	Tariq Glass Limited
109	Pakistan Paper Prouducts Ltd.	147	Thal Limited.
110	Premium Textile Mills Ltd.	148	Treet Corporation Ltd.
111	Pakistan Refinery Ltd.	149	Tri-Pack Films Limited
112	Prosperity Weaving Mills Limited	150	Tandlianwala Sugar Mills Limited
113	Pakistan Services Ltd	151	Unilever Pakistan
114	Pak Suzuki Motor Co. Ltd.	152	Yousuf Weaving Mills Limited.

Appendix C
Time series cross-sectional regression of R-square on information environment variables for portfolio 1 to portfolio 5

Time series cross-sectional regression of R-square on information environment variables for portfolio 1

	1 Coeff.	2 Coeff.	3 Coeff.	4 Coeff.	5 Coeff.	6 Coeff.	7 Coeff.	8 Coeff.	9 Coeff.	10 Coeff.	11 Coeff.	12 Coeff.
Const.	1.088	0.134	-0.011	0.160	1.573	1.281	1.614	0.507	0.316	0.553	0.095	0.045
Prob.	(0.18)	(0.63)	(0.97)	(0.56)	(0.01)	(0.03)	(0.01)	(0.09)	(0.30)	(0.07)	(0.73)	(0.87)
Ins. Own.	0.008	0.009	0.025	0.016	0.006	0.024	0.014	0.005	0.023	0.011	0.009	0.019
Prob.	(0.73)	(0.71)	(0.29)	(0.49)	(0.78)	(0.31)	(0.55)	(0.83)	(0.33)	(0.62)	(0.71)	(0.43)
Age	-0.015	-0.014	-0.021	-0.016	-0.016	-0.023	-0.018	-0.016	-0.023	-0.018	-0.014	-0.021
Prob.	(0.18)	(0.22)	(0.07)	(0.16)	(0.16)	(0.05)	(0.11)	(0.16)	(0.05)	(0.12)	(0.23)	(0.08)
Trade cost	-0.023	-0.031	0.006	-0.023	-0.032	0.006	-0.024	-0.032	0.006	-0.026	-0.031	0.000
Prob.	(0.39)	(0.22)	(0.82)	(0.35)	(0.20)	(0.81)	(0.32)	(0.19)	(0.81)	(0.29)	(0.21)	(1.00)
Size	0.003	-0.002	-0.001	0.002	0.000	0.001	0.004	0.001	0.002	0.005	-0.001	-0.004
Prob.	(0.56)	(0.76)	(0.92)	(0.63)	(0.97)	(0.87)	(0.44)	(0.79)	(0.68)	(0.29)	(0.79)	(0.51)
BTM	-0.003	0.007	0.004	-0.005	-0.003	-0.003	-0.012	-0.013	-0.012	-0.022	0.003	-0.008
Prob.	(0.97)	(0.90)	(0.95)	(0.94)	(0.96)	(0.96)	(0.83)	(0.83)	(0.85)	(0.71)	(0.96)	(0.89)
Vol.	0.009	0.006	0.016	0.005	0.005	0.015	0.004	0.005	0.016	0.005	0.006	0.015
Prob.	(0.19)	(0.12)	(0.00)	(0.20)	(0.19)	(0.00)	(0.28)	(0.17)	(0.00)	(0.24)	(0.14)	(0.00)
Turn. rate	0.601											
Prob.	(0.74)											
Value traded	-0.005											
Prob.	(0.35)											
Illiq.	-0.188	-0.119	-0.119		-0.115	-0.116		-0.104	-0.107		-0.127	-0.045
Prob.	(0.07)	(0.07)	(0.08)		(0.08)	(0.08)		(0.11)	(0.11)		(0.12)	(0.58)
Zero Vol.	-0.125	-0.121		-0.121	-0.125		-0.125	-0.127		-0.127	-0.123	
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Daily Ret.	0.062	-0.086	-0.045	-0.060								
Prob.	(0.72)	(0.60)	(0.78)	(0.71)								
Weekly Ret.	-1.138				-2.083	-1.861	-2.092					
Prob.					(0.00)	(0.01)	(0.00)					
Monthly Ret.	-0.312							-0.494	-0.427	-0.511		
Prob.	(0.32)							(0.00)	(0.01)	(0.00)		
Abs. Ret.	0.067										0.027	-0.177
Prob.	(0.60)										(0.82)	(0.11)
Adj. R	0.158	0.145	0.098	0.139	0.165	0.114	0.160	0.167	0.114	0.162	0.144	0.105
F stat.	5.406	7.198	5.458	7.630	8.240	6.315	8.814	8.305	6.309	8.973	7.167	5.805
F Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 1

	13 Coeff.	14 Coeff.	15 Coeff.	16 Coeff.	17 Coeff.	18 Coeff.	19 Coeff.	20 Coeff.	21 Coeff.	22 Coeff.	23 Coeff.	24 Coeff.
Const.	0.152	0.233	0.249	0.238	1.733	1.751	1.747	0.615	0.639	0.638	0.190	0.346
Prob.	(0.58)	(0.39)	(0.38)	(0.38)	(0.00)	(0.00)	(0.00)	(0.03)	(0.04)	(0.03)	(0.47)	(0.21)
Ins. Own.	0.012	0.007	0.029	0.013	0.005	0.028	0.011	0.003	0.027	0.008	0.008	0.022
Prob.	(0.61)	(0.76)	(0.23)	(0.57)	(0.84)	(0.24)	(0.64)	(0.90)	(0.26)	(0.72)	(0.74)	(0.36)
Age	-0.016	-0.018	-0.038	-0.018	-0.018	-0.039	-0.019	-0.018	-0.039	-0.019	-0.017	-0.037
Prob.	(0.17)	(0.12)	(0.00)	(0.11)	(0.10)	(0.00)	(0.09)	(0.10)	(0.00)	(0.09)	(0.13)	(0.00)
Trade cost	-0.025	-0.032	0.021	-0.026	-0.034	0.021	-0.028	-0.035	0.021	-0.029	-0.033	0.014
Prob.	(0.30)	(0.20)	(0.39)	(0.29)	(0.17)	(0.39)	(0.26)	(0.16)	(0.38)	(0.23)	(0.19)	(0.56)
Size	-0.001	-0.001	0.002	0.002	0.001	0.004	0.004	0.002	0.006	0.005	0.000	-0.002
Prob.	(0.92)	(0.85)	(0.68)	(0.62)	(0.91)	(0.42)	(0.40)	(0.66)	(0.29)	(0.26)	(0.93)	(0.77)
BTM	-0.010	-0.002	-0.033	-0.011	-0.010	-0.033	-0.017	-0.020	-0.042	-0.027	-0.004	-0.039
Prob.	(0.87)	(0.97)	(0.60)	(0.85)	(0.87)	(0.59)	(0.77)	(0.73)	(0.49)	(0.64)	(0.95)	(0.52)
Vol.	0.006											
Prob.	(0.16)											
Turn. rate		0.708	2.752	0.912	1.017	3.066	1.215	1.108	3.157	1.292	0.733	2.368
Prob.		(0.62)	(0.06)	(0.53)	(0.48)	(0.04)	(0.39)	(0.44)	(0.03)	(0.36)	(0.61)	(0.11)
Value traded												
Prob.												
Illiq.		-0.102	-0.056		-0.099	-0.056		-0.087	-0.045		-0.120	0.033
Prob.		(0.12)	(0.42)		(0.12)	(0.41)		(0.18)	(0.51)		(0.14)	(0.68)
Zero Vol.	-0.111	-0.142		-0.138	-0.142		-0.138	-0.145		-0.141	-0.146	
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Daily Ret.		-0.065	0.055	-0.045								
Prob.		(0.69)	(0.75)	(0.78)								
Weekly Ret.					-2.189	-2.123	-2.193					
Prob.					(0.00)	(0.01)	(0.00)					
Monthly Ret.								-0.517	-0.464	-0.532		
Prob.								(0.00)	(0.01)	(0.00)		
Abs. Ret.	-0.086										0.049	-0.233
Prob.	(0.38)										(0.68)	(0.04)
Adj. R	0.141	0.139	0.047	0.135	0.162	0.069	0.159	0.163	0.066	0.161	0.139	0.059
F stat.	7.726	6.915	3.039	7.443	8.074	4.037	8.748	8.125	3.929	8.890	6.916	3.589
F Sig.	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 1

	25 Coeff.	26 Coeff.	27 Coeff.	28 Coeff.	29 Coeff.	30 Coeff.	31 Coeff.	32 Coeff.	33 Coeff.	34 Coeff.	35 Coeff.	36 Coeff.	37 Coeff.
Const.	0.238	0.214	0.201	0.202	1.674	1.528	1.639	0.593	0.549	0.590	0.177	0.296	0.197
Prob.	(0.37)	(0.43)	(0.48)	(0.46)	(0.00)	(0.01)	(0.00)	(0.04)	(0.08)	(0.05)	(0.51)	(0.28)	(0.46)
Ins. Own.	0.010	0.007	0.029	0.010	0.005	0.029	0.009	0.004	0.028	0.007	0.007	0.020	0.008
Prob.	(0.65)	(0.76)	(0.23)	(0.65)	(0.81)	(0.23)	(0.68)	(0.87)	(0.24)	(0.76)	(0.75)	(0.41)	(0.72)
Age	-0.018	-0.017	-0.036	-0.017	-0.019	-0.039	-0.019	-0.019	-0.039	-0.019	-0.017	-0.034	-0.017
Prob.	(0.10)	(0.13)	(0.00)	(0.14)	(0.09)	(0.00)	(0.10)	(0.09)	(0.00)	(0.10)	(0.14)	(0.00)	(0.14)
Trade cost	-0.028	-0.036	0.009	-0.035	-0.036	0.012	-0.034	-0.037	0.012	-0.035	-0.036	0.000	-0.036
Prob.	(0.27)	(0.16)	(0.71)	(0.18)	(0.16)	(0.64)	(0.18)	(0.15)	(0.65)	(0.17)	(0.16)	(0.99)	(0.17)
Size	0.000	-0.002	-0.001	0.000	0.000	0.001	0.001	0.001	0.002	0.003	-0.002	-0.005	-0.002
Prob.	(0.94)	(0.69)	(0.83)	(0.94)	(0.94)	(0.89)	(0.77)	(0.82)	(0.73)	(0.58)	(0.76)	(0.34)	(0.76)
BTM	-0.016	-0.004	-0.036	-0.010	-0.011	-0.036	-0.016	-0.021	-0.044	-0.026	-0.006	-0.043	-0.014
Prob.	(0.79)	(0.95)	(0.57)	(0.87)	(0.86)	(0.56)	(0.78)	(0.72)	(0.47)	(0.65)	(0.92)	(0.49)	(0.81)
Vol.													
Prob.													
Turn. rate	0.848												
Prob.	(0.56)												
Value traded		0.003	0.007	0.004	0.002	0.007	0.003	0.002	0.007	0.003	0.002	0.007	0.004
Prob.		(0.42)	(0.02)	(0.17)	(0.60)	(0.04)	(0.25)	(0.56)	(0.03)	(0.26)	(0.45)	(0.02)	(0.20)
Illiq.		-0.081	0.000		-0.088	-0.007		-0.075	0.005		-0.095	0.100	0.000
Prob.		(0.26)	(1.00)		(0.21)	(0.93)		(0.29)	(0.94)		(0.29)	(0.24)	
Zero Vol.	-0.133	-0.140		-0.135	-0.143		-0.137	-0.145		-0.140	-0.142		-0.131
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)
Daily Ret.		-0.066	0.049	-0.052									
Prob.		(0.69)	(0.77)	(0.75)									
Weekly Ret.					-2.114	-1.861	-2.075						
Prob.					(0.00)	(0.02)	(0.01)						
Monthly Ret.								-0.498	-0.403	-0.501			
Prob.								(0.00)	(0.02)	(0.00)			
Abs. Ret.	-0.058										0.035	-0.257	-0.043
Prob.	(0.55)										(0.77)	(0.02)	(0.66)
Adj. R	0.136	0.140	0.052	0.140	0.162	0.069	0.160	0.162	0.067	0.162	0.140	0.067	0.140
F stat.	7.486	6.968	3.271	7.670	8.043	4.041	8.838	8.090	3.950	8.956	6.957	3.968	7.684
F Sig.	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 2

	1	2	3	4	5	6	7	8	9	10	11	12
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	0.85	-1.58	-1.93	-1.73	0.30	-0.05	0.29	-1.11	-1.27	-1.16	-1.45	-1.62
Prob.	(0.63)	(0.20)	(0.11)	(0.15)	(0.83)	(0.97)	(0.83)	(0.31)	(0.24)	(0.28)	(0.17)	(0.13)
Ins. Own.	0.05	0.04	0.02	0.04	0.04	0.01	0.04	0.04	0.01	0.04	0.04	0.02
Prob.	(0.48)	(0.55)	(0.76)	(0.53)	(0.54)	(0.84)	(0.53)	(0.58)	(0.87)	(0.57)	(0.55)	(0.81)
Age	-0.08	-0.05	-0.04	-0.06	-0.07	-0.05	-0.07	-0.06	-0.04	-0.06	-0.06	-0.04
Prob.	(0.04)	(0.16)	(0.30)	(0.14)	(0.07)	(0.18)	(0.07)	(0.10)	(0.23)	(0.08)	(0.14)	(0.29)
Trade cost	-0.01	0.00	0.03	0.00	-0.01	0.02	-0.01	-0.01	0.02	-0.01	0.00	0.03
Prob.	(0.81)	(0.95)	(0.34)	(0.91)	(0.82)	(0.41)	(0.75)	(0.80)	(0.41)	(0.70)	(0.91)	(0.33)
Size	0.02	-0.01	-0.02	-0.01	0.00	-0.01	0.00	-0.01	-0.01	0.00	-0.01	-0.01
Prob.	(0.48)	(0.51)	(0.34)	(0.64)	(0.80)	(0.57)	(0.86)	(0.76)	(0.52)	(0.85)	(0.64)	(0.38)
BTM	0.32	0.43	0.43	0.46	0.39	0.38	0.40	0.39	0.38	0.40	0.39	0.41
Prob.	(0.18)	(0.06)	(0.07)	(0.04)	(0.10)	(0.11)	(0.08)	(0.10)	(0.10)	(0.08)	(0.09)	(0.08)
Vol.	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Prob.	(0.39)	(0.96)	(0.62)	(0.97)	(0.65)	(0.27)	(0.64)	(0.75)	(0.35)	(0.74)	(0.80)	(0.55)
Turn. rate	0.54											
Prob.	(0.33)											
Value traded	-0.02											
Prob.	(0.32)											
Illiq.	-1.06	-0.36	-0.54		-0.12	-0.41		-0.20	-0.48		-0.81	-0.64
Prob.	(0.17)	(0.56)	(0.37)		(0.84)	(0.51)		(0.75)	(0.43)		(0.27)	(0.38)
Zero Vol.	-0.13	-0.09		-0.09	-0.10		-0.11	-0.10		-0.11	-0.12	
Prob.	(0.03)	(0.09)		(0.07)	(0.04)		(0.03)	(0.04)		(0.03)	(0.04)	
Daily Ret.	1.32	-0.06	0.35	-0.04								
Prob.	(0.16)	(0.94)	(0.64)	(0.95)								
Weekly Ret.	-4.14				-2.50	-2.07	-2.55					
Prob.	(0.09)				(0.04)	(0.08)	(0.03)					
Monthly Ret.	0.00							-0.46	-0.33	-0.47		
Prob.	(1.00)							(0.10)	(0.22)	(0.09)		
Abs. Ret.	0.86										0.48	0.06
Prob.	(0.07)										(0.26)	(0.86)
Adj. R	0.27	0.26	0.25	0.26	0.27	0.26	0.27	0.27	0.26	0.27	0.26	0.25
F stat.	2.46	2.43	2.40	2.46	2.52	2.46	2.56	2.49	2.43	2.53	2.45	2.40
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for

	13	14	15	16	17	18	19	20	21	22	23	24
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-1.76	-1.58	-1.96	-1.73	0.37	-0.21	0.35	-1.08	-1.29	-1.14	-1.48	-1.60
Prob.	(0.08)	(0.20)	(0.11)	(0.15)	(0.79)	(0.88)	(0.80)	(0.32)	(0.24)	(0.29)	(0.16)	(0.13)
Ins. Own.	0.04	0.04	0.02	0.04	0.04	0.01	0.04	0.04	0.01	0.04	0.04	0.02
Prob.	(0.52)	(0.55)	(0.76)	(0.53)	(0.51)	(0.84)	(0.51)	(0.56)	(0.87)	(0.55)	(0.55)	(0.82)
Age	-0.06	-0.05	-0.04	-0.05	-0.07	-0.05	-0.07	-0.06	-0.05	-0.07	-0.05	-0.04
Prob.	(0.12)	(0.17)	(0.28)	(0.14)	(0.06)	(0.15)	(0.05)	(0.08)	(0.19)	(0.07)	(0.15)	(0.25)
Trade cost	-0.01	0.00	0.03	0.00	-0.01	0.03	-0.01	-0.01	0.03	-0.01	0.00	0.03
Prob.	(0.76)	(0.94)	(0.32)	(0.91)	(0.78)	(0.35)	(0.71)	(0.77)	(0.36)	(0.66)	(0.94)	(0.31)
Size	0.00	-0.01	-0.02	-0.01	0.00	-0.01	0.00	0.00	-0.01	0.00	-0.01	-0.01
Prob.	(0.84)	(0.51)	(0.33)	(0.64)	(0.82)	(0.54)	(0.88)	(0.78)	(0.49)	(0.87)	(0.62)	(0.38)
BTM	0.46	0.43	0.43	0.46	0.39	0.39	0.40	0.39	0.39	0.40	0.39	0.42
Prob.	(0.04)	(0.06)	(0.06)	(0.04)	(0.09)	(0.10)	(0.08)	(0.10)	(0.10)	(0.08)	(0.09)	(0.08)
Vol.	0.00											
Prob.	(0.89)											
Turn. rate		0.15	0.15	0.14	0.37	0.31	0.37	0.32	0.26	0.32	0.13	0.15
Prob.		(0.75)	(0.75)	(0.75)	(0.43)	(0.51)	(0.43)	(0.50)	(0.59)	(0.49)	(0.79)	(0.75)
Value traded												
Prob.												
Illiq.		-0.36	-0.57		-0.13	-0.49		-0.20	-0.55		-0.79	-0.67
Prob.		(0.56)	(0.35)		(0.83)	(0.42)		(0.74)	(0.37)		(0.28)	(0.36)
Zero Vol.	-0.11	-0.09		-0.09	-0.11		-0.11	-0.11		-0.11	-0.11	
Prob.	(0.05)	(0.08)		(0.06)	(0.02)		(0.01)	(0.02)		(0.01)	(0.03)	
Daily Ret.		-0.06	0.41	-0.05								
Prob.		(0.93)	(0.58)	(0.95)								
Weekly Ret.					-2.57	-1.82	-2.61					
Prob.					(0.03)	(0.12)	(0.03)					
Monthly Ret.								-0.48	-0.28	-0.49		
Prob.								(0.08)	(0.29)	(0.07)		
Abs. Ret.	0.23										0.46	0.06
Prob.	(0.52)										(0.27)	(0.88)
Adj. R	0.26	0.26	0.25	0.26	0.27	0.26	0.27	0.27	0.25	0.27	0.26	0.25
F stat.	2.47	2.43	2.40	2.46	2.53	2.45	2.57	2.49	2.42	2.53	2.45	2.39
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 2

	25	26	27	28	29	30	31	32	33	34	35	36	37
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Const.	-1.77	-1.57	-1.96	-1.73	0.23	-0.24	0.22	-1.11	-1.31	-1.17	-1.44	-1.61	-1.76
Prob.	(0.08)	(0.20)	(0.11)	(0.15)	(0.87)	(0.86)	(0.87)	(0.31)	(0.23)	(0.27)	(0.17)	(0.13)	(0.08)
Ins. Own.	0.04	0.04	0.02	0.04	0.04	0.01	0.04	0.04	0.01	0.04	0.04	0.02	0.04
Prob.	(0.52)	(0.55)	(0.76)	(0.53)	(0.53)	(0.85)	(0.52)	(0.57)	(0.87)	(0.56)	(0.55)	(0.82)	(0.52)
Age	-0.06	-0.05	-0.04	-0.06	-0.07	-0.05	-0.07	-0.07	-0.05	-0.07	-0.06	-0.04	-0.06
Prob.	(0.12)	(0.15)	(0.29)	(0.13)	(0.07)	(0.18)	(0.06)	(0.09)	(0.22)	(0.08)	(0.13)	(0.27)	(0.12)
Trade cost	-0.01	0.00	0.03	0.00	-0.01	0.03	-0.01	-0.01	0.03	-0.01	0.00	0.03	-0.01
Prob.	(0.77)	(0.94)	(0.33)	(0.90)	(0.79)	(0.39)	(0.72)	(0.79)	(0.39)	(0.68)	(0.93)	(0.33)	(0.76)
Size	0.00	-0.01	-0.02	-0.01	0.00	-0.01	0.00	-0.01	-0.01	0.00	-0.01	-0.01	0.00
Prob.	(0.82)	(0.56)	(0.33)	(0.69)	(0.79)	(0.47)	(0.84)	(0.76)	(0.44)	(0.85)	(0.71)	(0.37)	(0.87)
BTM	0.46	0.43	0.43	0.46	0.39	0.39	0.40	0.39	0.39	0.40	0.39	0.41	0.46
Prob.	(0.04)	(0.06)	(0.07)	(0.04)	(0.09)	(0.10)	(0.08)	(0.09)	(0.10)	(0.08)	(0.09)	(0.08)	(0.04)
Vol.													
Prob.													
Turn. rate	0.13												
Prob.	(0.78)												
Value traded		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prob.		(0.82)	(0.86)	(0.89)	(0.92)	(0.57)	(0.89)	(1.00)	(0.66)	(0.96)	(0.72)	(0.81)	(0.87)
Illiq.		-0.38	-0.55		-0.13	-0.42		-0.21	-0.50		-0.84	-0.64	
Prob.		(0.54)	(0.38)		(0.83)	(0.50)		(0.74)	(0.43)		(0.26)	(0.39)	
Zero Vol.	-0.11	-0.09		-0.09	-0.11		-0.11	-0.11		-0.11	-0.12		-0.11
Prob.	(0.04)	(0.08)		(0.06)	(0.02)		(0.02)	(0.03)		(0.02)	(0.03)		(0.04)
Daily Ret.		-0.06	0.40	-0.04									
Prob.		(0.94)	(0.59)	(0.95)									
Weekly Ret.					-2.39	-1.80	-2.43						
Prob.					(0.04)	(0.12)	(0.04)						
Monthly Ret.								-0.44	-0.28	-0.45			
Prob.								(0.11)	(0.30)	(0.09)			
Abs. Ret.	0.22										0.48	0.06	0.23
Prob.	(0.54)										(0.25)	(0.87)	(0.52)
Adj. R	0.26	0.26	0.25	0.26	0.27	0.26	0.27	0.27	0.25	0.27	0.26	0.25	0.26
F stat.	2.47	2.43	2.40	2.46	2.52	2.44	2.56	2.48	2.41	2.52	2.46	2.39	2.47
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 3

	1 Coeff.	2 Coeff.	3 Coeff.	4 Coeff.	5 Coeff.	6 Coeff.	7 Coeff.	8 Coeff.	9 Coeff.	10 Coeff.	11 Coeff.	12 Coeff.
Const.	-1.51	0.72	-0.46	1.65	2.48	1.38	3.07	-0.25	-1.01	0.25	-2.00	-2.62
Prob.	(0.59)	(0.71)	(0.81)	(0.36)	(0.16)	(0.43)	(0.05)	(0.86)	(0.48)	(0.85)	(0.15)	(0.06)
Ins. Own.	-0.02	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	0.00	0.00
Prob.	(0.47)	(0.74)	(0.86)	(0.80)	(0.60)	(0.72)	(0.63)	(0.60)	(0.72)	(0.63)	(0.90)	(0.98)
Age	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01
Prob.	(0.58)	(0.57)	(0.35)	(0.60)	(0.42)	(0.24)	(0.44)	(0.41)	(0.23)	(0.43)	(0.67)	(0.43)
Trade cost	-0.01	0.03	0.05	0.03	0.03	0.05	0.03	0.03	0.05	0.03	0.03	0.05
Prob.	(0.78)	(0.12)	(0.01)	(0.19)	(0.13)	(0.01)	(0.17)	(0.11)	(0.01)	(0.14)	(0.11)	(0.01)
Size	-0.04	-0.02	-0.02	-0.03	-0.03	-0.02	-0.03	-0.03	-0.02	-0.03	-0.02	-0.02
Prob.	(0.01)	(0.07)	(0.25)	(0.04)	(0.03)	(0.14)	(0.02)	(0.02)	(0.13)	(0.01)	(0.10)	(0.19)
BTM	0.44	0.39	0.49	0.23	0.27	0.37	0.17	0.29	0.39	0.19	0.48	0.59
Prob.	(0.16)	(0.20)	(0.12)	(0.42)	(0.38)	(0.22)	(0.54)	(0.33)	(0.20)	(0.49)	(0.12)	(0.05)
Vol.	-0.01	0.01	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02
Prob.	(0.36)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Turn. rate	0.27											
Prob.	(0.88)											
Value traded	0.03											
Prob.	(0.06)											
Illiq.	2.31	1.67	2.01		1.00	1.40		1.06	1.44		2.00	3.06
Prob.	(0.13)	(0.17)	(0.11)		(0.41)	(0.26)		(0.38)	(0.24)		(0.14)	(0.02)
Zero Vol.	-0.22	-0.15		-0.16	-0.16		-0.17	-0.16		-0.17	-0.14	
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.01)	
Daily Ret.	2.34	-3.30	-2.51	-3.59								
Prob.	(0.34)	(0.05)	(0.14)	(0.03)								
Weekly Ret.	-1.54				-4.96	-4.37	-5.17					
Prob.	(0.63)				(0.00)	(0.00)	(0.00)					
Monthly Ret.	-1.20							-1.17	-1.05	-1.22		
Prob.	(0.12)							(0.00)	(0.00)	(0.00)		
Abs. Ret.	0.59										-0.04	-1.11
Prob.	(0.46)										(0.95)	(0.06)
Adj. R	0.24	0.21	0.18	0.21	0.24	0.20	0.24	0.24	0.21	0.24	0.20	0.18
F stat.	8.44	10.71	10.03	11.78	12.41	11.54	13.89	12.61	11.74	14.10	10.16	10.26
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 3

	13 Coeff.	14 Coeff.	15 Coeff.	16 Coeff.	17 Coeff.	18 Coeff.	19 Coeff.	20 Coeff.	21 Coeff.	22 Coeff.	23 Coeff.	24 Coeff.
Const.	-1.20	0.85	-1.48	2.68	2.66	0.54	4.06	-0.39	-2.09	0.75	-2.18	-3.73
Prob.	(0.34)	(0.66)	(0.47)	(0.14)	(0.13)	(0.77)	(0.01)	(0.78)	(0.16)	(0.55)	(0.12)	(0.01)
Ins. Own.	0.00	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	0.00
Prob.	(0.94)	(0.65)	(0.78)	(0.74)	(0.51)	(0.63)	(0.56)	(0.52)	(0.64)	(0.57)	(0.81)	(0.97)
Age	0.00	-0.01	-0.03	-0.01	-0.01	-0.04	-0.02	-0.02	-0.04	-0.02	-0.01	-0.03
Prob.	(0.75)	(0.40)	(0.03)	(0.37)	(0.30)	(0.01)	(0.28)	(0.29)	(0.01)	(0.27)	(0.50)	(0.06)
Trade cost	0.03	0.02	0.03	0.00	0.02	0.03	0.01	0.02	0.03	0.01	0.02	0.04
Prob.	(0.19)	(0.37)	(0.09)	(0.86)	(0.38)	(0.09)	(0.73)	(0.33)	(0.08)	(0.66)	(0.36)	(0.07)
Size	-0.03	-0.02	0.01	-0.02	-0.02	0.01	-0.03	-0.02	0.01	-0.03	-0.01	0.01
Prob.	(0.06)	(0.24)	(0.29)	(0.12)	(0.12)	(0.44)	(0.06)	(0.10)	(0.47)	(0.05)	(0.30)	(0.59)
BTM	0.30	0.46	0.76	0.16	0.33	0.64	0.11	0.36	0.66	0.13	0.54	0.86
Prob.	(0.28)	(0.14)	(0.02)	(0.57)	(0.27)	(0.05)	(0.69)	(0.23)	(0.04)	(0.63)	(0.08)	(0.01)
Vol.	0.02											
Prob.	(0.00)											
Turn. rate		2.35	3.80	2.29	2.96	4.40	2.96	2.93	4.39	2.93	2.08	3.58
Prob.		(0.10)	(0.01)	(0.11)	(0.03)	(0.00)	(0.03)	(0.03)	(0.00)	(0.04)	(0.15)	(0.01)
Value traded												
Prob.												
Illiq.		2.86	5.53		2.11	4.89		2.19	4.96		3.01	6.71
Prob.		(0.02)	(0.00)		(0.07)	(0.00)		(0.06)	(0.00)		(0.02)	(0.00)
Zero Vol.	-0.16	-0.22		-0.25	-0.22		-0.25	-0.22		-0.25	-0.22	
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Daily Ret.		-3.78	-2.66	-4.42								
Prob.		(0.03)	(0.14)	(0.01)								
Weekly Ret.					-5.51	-4.76	-6.03					
Prob.					(0.00)	(0.00)	(0.00)					
Monthly Ret.								-1.29	-1.12	-1.40		
Prob.								(0.00)	(0.00)	(0.00)		
Abs. Ret.	0.39										0.25	-1.78
Prob.	(0.53)										(0.71)	(0.00)
Adj. R	0.20	0.20	0.10	0.18	0.23	0.13	0.22	0.23	0.13	0.23	0.18	0.12
F stat.	11.11	9.94	5.55	10.27	11.89	7.02	12.88	12.06	7.16	13.01	9.27	6.53
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 3

	25 Coeff.	26 Coeff.	27 Coeff.	28 Coeff.	29 Coeff.	30 Coeff.	31 Coeff.	32 Coeff.	33 Coeff.	34 Coeff.	35 Coeff.	36 Coeff.	37 Coeff.
Const.	-0.89	0.48	-1.24	2.12	2.17	0.51	3.40	-0.68	-2.00	0.32	-2.44	-3.60	-1.27
Prob.	(0.49)	(0.80)	(0.53)	(0.24)	(0.21)	(0.77)	(0.03)	(0.62)	(0.16)	(0.80)	(0.08)	(0.01)	(0.32)
Ins. Own.	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	0.00	-0.01
Prob.	(0.86)	(0.66)	(0.74)	(0.74)	(0.53)	(0.61)	(0.57)	(0.53)	(0.60)	(0.58)	(0.81)	(0.92)	(0.86)
Age	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01	0.00	-0.01	0.00
Prob.	(0.56)	(0.66)	(0.30)	(0.65)	(0.51)	(0.20)	(0.50)	(0.50)	(0.20)	(0.49)	(0.79)	(0.37)	(0.86)
Trade cost	0.00	0.01	0.02	0.00	0.01	0.02	0.00	0.01	0.02	0.00	0.01	0.02	0.00
Prob.	(0.84)	(0.57)	(0.37)	(0.92)	(0.60)	(0.38)	(0.97)	(0.53)	(0.34)	(0.90)	(0.55)	(0.30)	(0.95)
Size	-0.02	-0.03	-0.01	-0.03	-0.03	-0.02	-0.04	-0.03	-0.02	-0.04	-0.03	-0.02	-0.03
Prob.	(0.18)	(0.05)	(0.28)	(0.02)	(0.02)	(0.15)	(0.01)	(0.01)	(0.13)	(0.00)	(0.07)	(0.22)	(0.03)
BTM	0.26	0.48	0.69	0.22	0.36	0.58	0.16	0.38	0.60	0.18	0.57	0.80	0.31
Prob.	(0.36)	(0.11)	(0.03)	(0.44)	(0.23)	(0.06)	(0.56)	(0.20)	(0.05)	(0.50)	(0.06)	(0.01)	(0.27)
Vol.													
Prob.													
Turn. rate	1.82												
Prob.	(0.20)												
Value traded		0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02
Prob.		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Illiq.		2.59	4.12		1.88	3.51		1.94	3.56		2.79	5.11	
Prob.		(0.03)	(0.00)		(0.10)	(0.00)		(0.09)	(0.00)		(0.03)	(0.00)	
Zero Vol.	-0.27	-0.17		-0.20	-0.18		-0.20	-0.18		-0.20	-0.17		-0.21
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)
Daily Ret.		-3.61	-2.84	-4.20									
Prob.		(0.03)	(0.10)	(0.01)									
Weekly Ret.					-5.16	-4.59	-5.63						
Prob.					(0.00)	(0.00)	(0.00)						
Monthly Ret.								-1.22	-1.10	-1.32			
Prob.								(0.00)	(0.00)	(0.00)			
Abs. Ret.	1.02										0.19	-1.18	0.89
Prob.	(0.09)										(0.77)	(0.04)	(0.14)
Adj. R	0.17	0.22	0.17	0.21	0.24	0.19	0.24	0.25	0.20	0.24	0.20	0.17	0.20
F stat.	9.66	11.02	9.32	11.63	12.84	10.87	14.04	13.05	11.09	14.24	10.37	9.52	10.98
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 4

	1 Coeff.	2 Coeff.	3 Coeff.	4 Coeff.	5 Coeff.	6 Coeff.	7 Coeff.	8 Coeff.	9 Coeff.	10 Coeff.	11 Coeff.	12 Coeff.
Const.	1.55	-2.24	-1.75	-1.95	2.26	1.98	2.47	-0.97	-1.19	-0.77	-2.95	-3.11
Prob.	(0.69)	(0.49)	(0.59)	(0.53)	(0.48)	(0.54)	(0.43)	(0.74)	(0.69)	(0.78)	(0.31)	(0.29)
Ins. Own.	-0.02	-0.02	-0.03	-0.02	-0.02	-0.04	-0.02	-0.02	-0.04	-0.02	-0.02	-0.03
Prob.	(0.60)	(0.61)	(0.39)	(0.62)	(0.55)	(0.31)	(0.56)	(0.60)	(0.34)	(0.61)	(0.56)	(0.40)
Age	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
Prob.	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Trade cost	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03
Prob.	(0.44)	(0.25)	(0.06)	(0.27)	(0.32)	(0.06)	(0.33)	(0.32)	(0.06)	(0.33)	(0.21)	(0.05)
Size	-0.04	-0.03	-0.02	-0.03	-0.04	-0.03	-0.04	-0.04	-0.03	-0.04	-0.03	-0.03
Prob.	(0.01)	(0.03)	(0.09)	(0.03)	(0.01)	(0.04)	(0.01)	(0.01)	(0.04)	(0.01)	(0.02)	(0.07)
BTM	0.44	0.71	0.67	0.65	0.48	0.48	0.44	0.50	0.50	0.45	0.74	0.75
Prob.	(0.51)	(0.28)	(0.31)	(0.30)	(0.45)	(0.45)	(0.48)	(0.44)	(0.44)	(0.46)	(0.25)	(0.25)
Vol.	0.03	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03
Prob.	(0.16)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Turn. rate	-0.40											
Prob.	(0.15)											
Value traded	0.00											
Prob.	0.99											
Illiq.	0.04	1.31	0.85		1.01	0.64		0.97	0.62		0.89	2.23
Prob.	(0.99)	(0.74)	(0.83)		(0.79)	(0.87)		(0.80)	(0.87)		(0.83)	(0.59)
Zero Vol.	-0.15	-0.14		-0.14	-0.15		-0.15	-0.15		-0.15	-0.15	
Prob.	(0.01)	(0.01)		(0.01)	(0.00)		(0.00)	(0.00)		(0.00)	(0.01)	
Daily Ret.	1.13	-0.79	-1.46	-0.83								
Prob.	(0.53)	(0.62)	(0.36)	(0.61)								
Weekly Ret.	-5.47				-5.76	-5.61	-5.78					
Prob.	(0.15)				(0.00)	(0.00)	(0.00)					
Monthly Ret.	-0.14							-1.21	-1.16	-1.21		
Prob.	(0.87)							(0.00)	(0.00)	(0.00)		
Abs. Ret.	0.15										0.17	-0.34
Prob.	(0.73)										(0.70)	(0.40)
Adj. R	0.26	0.24	0.22	0.24	0.26	0.25	0.27	0.26	0.24	0.26	0.24	0.22
F stat.	9.20	12.27	12.67	13.83	14.08	14.42	15.88	13.79	14.08	15.55	12.25	12.65
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 4

	13 Coeff.	14 Coeff.	15 Coeff.	16 Coeff.	17 Coeff.	18 Coeff.	19 Coeff.	20 Coeff.	21 Coeff.	22 Coeff.	23 Coeff.	24 Coeff.
Const.	-2.80	-2.33	-0.85	-1.28	2.05	0.98	2.96	-1.24	-2.19	-0.38	-3.39	-4.26
Prob.	(0.32)	(0.49)	(0.81)	(0.69)	(0.54)	(0.78)	(0.36)	(0.68)	(0.50)	(0.90)	(0.26)	(0.18)
Ins. Own.	-0.02	-0.01	-0.05	-0.01	-0.02	-0.06	-0.01	-0.01	-0.06	-0.01	-0.02	-0.04
Prob.	(0.57)	(0.76)	(0.28)	(0.82)	(0.68)	(0.17)	(0.73)	(0.74)	(0.19)	(0.79)	(0.70)	(0.35)
Age	-0.06	-0.07	-0.08	-0.07	-0.07	-0.09	-0.07	-0.07	-0.09	-0.07	-0.07	-0.08
Prob.	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Trade cost	0.02	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.03	0.00	0.01	0.03
Prob.	(0.21)	(0.77)	(0.14)	(0.88)	(0.88)	(0.08)	(0.78)	(0.87)	(0.08)	(0.80)	(0.69)	(0.11)
Size	-0.03	-0.03	0.00	-0.03	-0.03	-0.01	-0.03	-0.03	-0.01	-0.03	-0.03	-0.01
Prob.	(0.02)	(0.06)	(0.80)	(0.06)	(0.02)	(0.53)	(0.02)	(0.02)	(0.52)	(0.02)	(0.05)	(0.63)
BTM	0.71	0.85	0.86	0.64	0.63	0.80	0.44	0.63	0.80	0.45	0.90	1.06
Prob.	(0.26)	(0.21)	(0.23)	(0.33)	(0.34)	(0.26)	(0.49)	(0.34)	(0.26)	(0.48)	(0.18)	(0.14)
Vol.	0.02											
Prob.	(0.00)											
Turn. rate		0.17	0.33	0.17	0.20	0.37	0.20	0.20	0.37	0.20	0.16	0.32
Prob.		(0.51)	(0.23)	(0.52)	(0.43)	(0.17)	(0.43)	(0.43)	(0.17)	(0.43)	(0.53)	(0.24)
Value traded												
Prob.												
Illiq.		4.54	6.45		4.25	6.87		4.13	6.74		3.89	10.65
Prob.		(0.25)	(0.13)		(0.28)	(0.10)		(0.29)	(0.11)		(0.36)	(0.01)
Zero Vol.	-0.16	-0.29		-0.29	-0.30		-0.30	-0.30		-0.30	-0.31	
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Daily Ret.		-1.19	-3.72	-1.35								
Prob.		(0.48)	(0.03)	(0.42)								
Weekly Ret.					-6.04	-5.87	-6.11					
Prob.					(0.00)	(0.00)	(0.00)					
Monthly Ret.								-1.32	-1.30	-1.34		
Prob.								(0.00)	(0.00)	(0.00)		
Abs. Ret.	0.20										0.26	-1.14
Prob.	(0.63)										(0.56)	(0.01)
Adj. R	0.24	0.18	0.07	0.18	0.21	0.09	0.21	0.21	0.09	0.21	0.18	0.08
F stat.	13.82	9.06	4.23	10.02	10.76	5.02	11.95	10.62	4.94	11.80	9.04	4.62
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 4

	25 Coeff.	26 Coeff.	27 Coeff.	28 Coeff.	29 Coeff.	30 Coeff.	31 Coeff.	32 Coeff.	33 Coeff.	34 Coeff.	35 Coeff.	36 Coeff.	37 Coeff.
Const.	-2.69	-3.05	-2.69	-1.84	1.36	0.58	2.42	-1.92	-2.65	-0.92	-4.01	-4.61	-3.10
Prob.	(0.35)	(0.35)	(0.42)	(0.56)	(0.67)	(0.86)	(0.44)	(0.51)	(0.37)	(0.74)	(0.17)	(0.12)	(0.27)
Ins. Own.	-0.02	-0.03	-0.05	-0.02	-0.03	-0.06	-0.03	-0.03	-0.05	-0.02	-0.03	-0.05	-0.03
Prob.	(0.72)	(0.50)	(0.23)	(0.56)	(0.43)	(0.16)	(0.49)	(0.48)	(0.18)	(0.54)	(0.46)	(0.26)	(0.49)
Age	-0.06	-0.06	-0.06	-0.05	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.05	-0.06	-0.05
Prob.	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Trade cost	0.00	-0.01	0.00	-0.01	-0.01	0.00	-0.02	-0.01	0.00	-0.02	0.00	0.00	-0.01
Prob.	(0.93)	(0.73)	(0.96)	(0.36)	(0.61)	(0.95)	(0.29)	(0.63)	(0.98)	(0.31)	(0.80)	(0.94)	(0.48)
Size	-0.03	-0.03	-0.03	-0.03	-0.04	-0.03	-0.04	-0.04	-0.03	-0.04	-0.03	-0.03	-0.04
Prob.	(0.04)	(0.02)	(0.08)	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)	(0.02)	(0.06)	(0.01)
BTM	0.75	0.91	0.95	0.67	0.70	0.80	0.47	0.71	0.81	0.49	0.97	1.06	0.77
Prob.	(0.25)	(0.16)	(0.15)	(0.28)	(0.28)	(0.22)	(0.44)	(0.27)	(0.22)	(0.43)	(0.14)	(0.11)	(0.22)
Vol.													
Prob.													
Turn. rate	0.16												
Prob.	(0.54)												
Value traded		0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02
Prob.		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Illiq.		5.21	6.30		4.89	6.32		4.79	6.23		5.05	8.47	
Prob.		(0.18)	(0.11)		(0.20)	(0.10)		(0.21)	(0.11)		(0.22)	(0.04)	
Zero Vol.	-0.32	-0.17		-0.18	-0.18		-0.19	-0.18		-0.19	-0.18		-0.20
Prob.	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)
Daily Ret.		-1.06	-2.11	-1.24									
Prob.		(0.51)	(0.19)	(0.44)									
Weekly Ret.					-5.92	-5.79	-6.00						
Prob.					(0.00)	(0.00)	(0.00)						
Monthly Ret.								-1.25	-1.21	-1.27			
Prob.								(0.00)	(0.00)	(0.00)			
Abs. Ret.	0.41										0.11	-0.57	0.30
Prob.	(0.33)										(0.80)	(0.15)	(0.46)
Adj. R	0.18	0.23	0.20	0.23	0.26	0.23	0.26	0.26	0.22	0.25	0.23	0.21	0.23
F stat.	10.07	11.96	11.58	13.19	13.82	13.22	15.31	13.54	12.91	15.01	11.90	11.63	13.18
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 5

	1 Coeff.	2 Coeff.	3 Coeff.	4 Coeff.	5 Coeff.	6 Coeff.	7 Coeff.	8 Coeff.	9 Coeff.	10 Coeff.	11 Coeff.	12 Coeff.
Const.	-22.52	-5.06	-5.23	-7.04	-2.92	-2.43	-5.51	-14.07	-13.85	-17.11	-21.61	-21.52
Prob.	(0.06)	(0.61)	(0.60)	(0.43)	(0.72)	(0.77)	(0.45)	(0.06)	(0.06)	(0.01)	(0.00)	(0.00)
Ins. Own.	-0.02	0.00	0.00	0.01	-0.01	-0.01	0.01	0.00	0.00	0.02	0.01	0.01
Prob.	(0.83)	(0.99)	(1.00)	(0.90)	(0.93)	(0.94)	(0.91)	(0.99)	(1.00)	(0.81)	(0.95)	(0.94)
Age	-0.02	0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	0.02	0.01
Prob.	(0.56)	(0.83)	(0.95)	(0.87)	(0.71)	(0.61)	(0.64)	(0.66)	(0.58)	(0.59)	(0.57)	(0.68)
Trade cost	0.04	0.06	0.05	0.06	0.07	0.06	0.07	0.07	0.06	0.07	0.06	0.05
Prob.	(0.40)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)
Size	-0.03	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	0.00
Prob.	(0.15)	(0.64)	(0.71)	(0.63)	(0.25)	(0.27)	(0.24)	(0.35)	(0.37)	(0.34)	(0.77)	(0.84)
BTM	3.71	4.34	4.35	4.74	3.35	3.32	3.90	3.80	3.78	4.46	4.71	4.71
Prob.	(0.03)	(0.01)	(0.01)	(0.00)	(0.04)	(0.05)	(0.01)	(0.02)	(0.02)	(0.00)	(0.01)	(0.01)
Vol.	0.04	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06
Prob.	(0.28)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Turn. rate	-1.48											
Prob.	(0.25)											
Value traded	0.04											
Prob.	(0.25)											
Illiq.	-0.44	-2.76	-3.17		-3.80	-4.12		-4.67	-4.95		-1.62	-2.03
Prob.	(0.95)	(0.64)	(0.59)		(0.51)	(0.47)		(0.41)	(0.38)		(0.78)	(0.73)
Zero Vol.	0.05	0.15		0.15	0.09		0.10	0.08		0.08	0.14	
Prob.	(0.61)	(0.10)		(0.10)	(0.30)		(0.28)	(0.39)		(0.37)	(0.13)	
Daily Ret.	17.12	-21.37	-21.02	-21.05								
Prob.	(0.15)	(0.01)	(0.01)	(0.01)								
Weekly Ret.	-4.38				-17.83	-18.25	-17.64					
Prob.	(0.61)				(0.00)	(0.00)	(0.00)					
Monthly Ret.	-4.77							-4.64	-4.74	-4.57		
Prob.	(0.03)							(0.00)	(0.00)	(0.00)		
Abs. Ret.	-0.10										0.17	0.19
Prob.	(0.83)										(0.69)	(0.67)
Adj. R	0.42	0.38	0.38	0.39	0.42	0.42	0.42	0.42	0.42	0.42	0.37	0.37
F stat.	18.31	23.85	26.36	26.87	27.15	30.40	30.54	27.94	31.36	31.38	22.68	25.11
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 5												
	13 Coeff.	14 Coeff.	15 Coeff.	16 Coeff.	17 Coeff.	18 Coeff.	19 Coeff.	20 Coeff.	21 Coeff.	22 Coeff.	23 Coeff.	24 Coeff.
Const.	-22.63	-9.66	-10.40	-10.81	-11.58	-17.02	-13.07	-23.26	-27.55	-25.38	-31.88	-34.72
Prob.	(0.00)	(0.38)	(0.35)	(0.28)	(0.21)	(0.07)	(0.10)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ins. Own.	0.01	-0.11	-0.14	-0.10	-0.11	-0.15	-0.10	-0.10	-0.14	-0.08	-0.10	-0.14
Prob.	(0.89)	(0.32)	(0.19)	(0.33)	(0.28)	(0.15)	(0.31)	(0.33)	(0.17)	(0.39)	(0.35)	(0.21)
Age	0.02	0.01	0.03	0.01	0.00	0.02	0.00	0.00	0.02	-0.01	0.03	0.04
Prob.	(0.59)	(0.66)	(0.40)	(0.67)	(0.98)	(0.54)	(0.95)	(0.90)	(0.59)	(0.85)	(0.40)	(0.19)
Trade cost	0.06	-0.05	-0.05	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03	-0.05	-0.05
Prob.	(0.00)	(0.04)	(0.03)	(0.04)	(0.09)	(0.07)	(0.09)	(0.09)	(0.07)	(0.11)	(0.03)	(0.03)
Size	-0.01	0.06	0.07	0.06	0.05	0.07	0.05	0.05	0.07	0.05	0.07	0.08
Prob.	(0.76)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
BTM	4.94	6.56	7.08	6.80	5.64	6.48	5.96	6.04	6.86	6.50	7.08	7.67
Prob.	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Vol.	0.07											
Prob.	(0.00)											
Turn. rate		5.34	6.21	5.37	5.83	6.82	5.87	5.90	6.92	5.96	5.15	6.07
Prob.		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Value traded												
Prob.												
Illiq.		-1.63	-0.54		-2.22	-0.50		-3.27	-1.40		-0.13	1.23
Prob.		(0.80)	(0.94)		(0.73)	(0.94)		(0.61)	(0.83)		(0.98)	(0.86)
Zero Vol.	0.14	-0.28		-0.28	-0.36		-0.35	-0.37		-0.36	-0.31	
Prob.	(0.12)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Daily Ret.		-28.60	-31.10	-28.43								
Prob.		(0.00)	(0.00)	(0.00)								
Weekly Ret.					-19.65	-17.59	-19.56					
Prob.					(0.00)	(0.00)	(0.00)					
Monthly Ret.								-5.38	-4.83	-5.34		
Prob.								(0.00)	(0.00)	(0.00)		
Abs. Ret.	0.17										-0.05	-0.16
Prob.	(0.70)										(0.92)	(0.75)
Adj. R	0.37	0.24	0.21	0.24	0.27	0.23	0.27	0.28	0.24	0.29	0.21	0.19
F stat.	25.58	12.39	12.19	13.98	14.44	13.33	16.27	15.51	14.25	17.46	11.01	10.48
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C (Conti…)

Time series cross-sectional regression of R-square on information environment variables for portfolio 5

	25 Coeff.	26 Coeff.	27 Coeff.	28 Coeff.	29 Coeff.	30 Coeff.	31 Coeff.	32 Coeff.	33 Coeff.	34 Coeff.	35 Coeff.	36 Coeff.	37 Coeff.
Const.	-31.96	-5.34	-5.40	-1.90	-4.88	-4.66	-2.14	-16.23	-16.17	-14.22	-23.65	-23.44	-19.76
Prob.	-	(0.59)	(0.58)	(0.83)	(0.55)	(0.57)	(0.77)	(0.03)	(0.03)	(0.03)	(0.00)	(0.00)	(0.00)
Ins. Own.	-0.10	-0.04	-0.04	-0.07	-0.05	-0.05	-0.07	-0.04	-0.04	-0.06	-0.03	-0.03	-0.07
Prob.	(0.33)	(0.66)	(0.69)	(0.47)	(0.59)	(0.60)	(0.43)	(0.65)	(0.66)	(0.52)	(0.72)	(0.75)	(0.48)
Age	0.03	0.00	0.00	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.02	0.01	0.02
Prob.	(0.40)	(0.89)	(0.97)	(0.81)	(0.67)	(0.63)	(0.73)	(0.63)	(0.61)	(0.67)	(0.60)	(0.67)	(0.50)
Trade cost	-0.05	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.03
Prob.	(0.03)	(0.36)	(0.33)	(0.22)	(0.61)	(0.61)	(0.45)	(0.61)	(0.60)	(0.48)	(0.33)	(0.31)	(0.17)
Size	0.07	-0.01	-0.01	-0.01	-0.03	-0.03	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01
Prob.	(0.00)	(0.50)	(0.53)	(0.55)	(0.18)	(0.18)	(0.20)	(0.28)	(0.28)	(0.29)	(0.61)	(0.64)	(0.67)
BTM	7.10	4.71	4.68	4.03	3.77	3.75	3.19	4.23	4.22	3.79	5.12	5.09	4.26
Prob.	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Vol.													
Prob.													
Turn. rate	5.15												
Prob.	(0.00)												
Value traded		0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Prob.		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Illiq.		5.01	4.36		4.23	4.01		3.25	3.15		6.47	5.86	
Prob.		(0.40)	(0.46)		(0.46)	(0.48)		(0.57)	(0.58)		(0.28)	(0.33)	
Zero Vol.	-0.31	0.09		0.08	0.03		0.02	0.01		0.01	0.08		0.07
Prob.	(0.00)	(0.31)		(0.35)	(0.74)		(0.81)	(0.89)		(0.94)	(0.37)		(0.43)
Daily Ret.		-23.64	-23.26	-24.23									
Prob.		(0.00)	(0.01)	(0.00)									
Weekly Ret.					-18.00	-18.14	-18.20						
Prob.					(0.00)	(0.00)	(0.00)						
Monthly Ret.								-4.61	-4.63	-4.66			
Prob.								(0.00)	(0.00)	(0.00)			
Abs. Ret.	-0.05										-0.11	-0.09	-0.10
Prob.	(0.92)										(0.79)	(0.84)	(0.83)
Adj. R	0.22	0.39	0.39	0.39	0.42	0.42	0.42	0.42	0.43	0.43	0.37	0.37	0.37
F stat.	12.43	24.20	27.09	27.16	27.33	30.81	30.72	27.96	31.55	31.48	22.74	25.49	25.42
F Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00