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An Empirical Examination of Six-Factor Asset Pricing Model and Stock Market Anomalies in Emerging Equity Markets of India and Korea

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Abstract

Presence of anomalies in stock market is very evident but their existence is coupled with the asset pricing model used to estimate normal returns on the stocks. The domain of return estimation models is still evolving and there no consensus on one parsimonious model suitable for all asset classes or countries. It creates a need for revisiting the anomalies in light of Six-factor asset pricing model which in our study adds the turnover or liquidity factor to the Fama-French Five-factor model. This study analyses the equity anomalies in India and Korea, the leading emerging markets as per equity market capitalization. The equity stock market data during an eight-year horizon of July 2015 - June 2023 is comprehended to find the anomalies using the six-factor asset pricing model built on the Fama & French approach. It is a turnover augmented Fama-French Model. Hundred (25×4) quintile dependent portfolios of companies listed at the leading stock exchanges of the two countries - National Stock Exchange and Korea Stock Exchange, were formulated on 30th June each year using bivariate sorting. The multiple cross-sectional regression of monthly returns of the portfolios on independent factor variables yields alpha returns and beta coefficients for the select anomalies – size, value, profitability, investment and turnover. Presence of excess or abnormal returns on bivariate dependent portfolios is an indicator of presence of anomalies in India and Korea. The results show prevalence of only profitability effect and turnover effect in India, whereas, Korea depicts all but turnover anomaly. The profitability anomaly has the highest return in both the emerging markets. The liquidity-augmented Fama-French Five Factor model seems relevant for the both equity markets but performs better for Indian markets. The new model is capable of explaining majority of portfolio returns in this study. It implies that investors need to shift to six-factor model to estimate expected returns of their portfolios rather than the traditional models. The policy makers of these countries need to take into account the anomalies while taking initiatives to enhance the market microstructure of stock exchanges. This study also creates a base for further research in this field because some anomalies are surviving even after the six-factor model. There is scope for creating and testing new models especially for emerging markets.

Keywords: Stock market anomalies, Emerging markets, Multifactor asset pricing model, Market efficiency, turnover effect.

Introduction

It is evident that risk-return trade-off is the precursor of all investment decisions in financial markets. It means high risk securities must yield commensurately high return to the investor. Traditional models like Capital Asset Pricing Model (CAPM) state that expected return of security is a linear function of risk. However, investors are still able to beat the market by contrasting rational theory of investment. Investors in real market formulate profitable trading strategies based on numerous other non-risk factors, viz. company fundamentals, economic conditions, personal knowledge, intuition & experience, analyst recommendations, seasonal patterns, etc. Presence of anomalies related to size, value, profitability, liquidity, prior return patterns, under-reaction or overreaction, etc implies either market inefficiency or a mis-specified asset pricing model. Therefore, discovery of a parsimonious model to explain equity returns will enhance formulation of fool-proof trading strategies for investors.

On the estimation model front, Fama-French Three Factor model is a great progress over CAPM by inculcating size and value factors as explanatory variables but it still is not able to completely explain expected returns universally. So, the research journey continues to look for missing factors to increase explanatory power of asset pricing models. Fama-French Five Factor model is the most recent framework which is still under testing by current researchers. This paper thus augments literature in this area by researching on presence of stock market anomalies in select emerging markets and their dynamics with asset pricing models. India and Korea are amongst the top five largest emerging stock markets by market capitalization. Moreover, they have a nearly comparable size also. China, being multiple times in market cap, was left out from the sample. Saudi Arabia, though similar in size, has scant data available to support research. So, this leaves us with the two sample countries chosen. Emerging economies are a cynosure of global investors for high returns and risk

diversification. So, research results will assist global fund managers, analysts, investors and policy makers in portfolio construction, diversification and policy formulation respectively.

Literature Review

The whole story of anomalies in equity share market begins with asset pricing models used to predict the normally expected return on the equity share. Asset pricing models date back to 1952 when Harry Markovitz propounded Mean-Variance efficient portfolio theory which established a link between security return and its risk. It was extended by William Sharpe in 1964 with his Single index model which used market return as the only explanatory variable for a security's return. Thereafter, CAPM set forth a linear cross-sectional relationship between expected return and systematic risk (beta) of the security. However, CAPM was under constant testing and scrutiny for not being able to explain security returns in certain cases.

Major contradictions to CAPM were Banz (1981), Stattman (1980) DeBondt & Thaler (1985) and others. Such instances where security returns can't be fully explained by estimation model are called as anomalies. Equity anomalies like size, value, prior return are heavily documented whereas there is scarce research on liquidity, profitability, turnover, accruals, etc. Size of a firm inversely affects its stock's average returns. According to Banz (1981), firms with lower market value yield higher securities return, i.e., small firms outperform large firms. Value anomaly is presence of higher returns in firms with high Book equity-to-Market equity ratio. [Statman (1980)]. Such value stocks can also be identified using Earnings to Price ratio [Basu (1983)] or Dividend to Price Ratio [Bhandari (1988)]. It is the tendency of value stocks to outperform growth stocks. Value effect is well documented and accepted, however, debate continues about what explains value premium.

Table: 1 Existing Asset Pricing Models

Model	Equation
CAPM	$R_i = R_f + \beta_i[R_m - R_f] + \mu_i$
Single Index	$R_i - R_f = \alpha_i + \beta_i[R_m - R_f] + \mu_i$
Fama-French Three Factor Model	$R_i - R_f = \alpha_i + \beta_i[R_m - R_f] + s_i SMB_t + h_i HML_t + \mu_i$
Fama-French Five Factor Model	$R_i - R_f = \alpha_i + \beta_i[R_m - R_f] + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + \mu_i$

Source: Authors' compilation

Presence of CAPM anomalies led the researchers to find a new asset pricing model which could absorb size and value premium. Fama-French Three Factor Model (FFTF) (1996) is capable of explaining many previously reported anomalies by expanding CAPM with size and value factors. Inclusion of size and value coefficients in asset pricing model enabled it to completely justify security returns and thus solve the question of equity anomalies.

However, the respite from anomalous returns was short and in no time many other equity anomalies were discovered. Various other firm characteristics like Liquidity, Accruals, Stock repurchases, Stock issues, Profitability and Investments are also proven to affect security returns. Amihud & Mendelson (2002), Hwang & Lu (2007) find that investors demand premium for less liquid firms. There is a negative relation between liquidity of stock in market and its stock returns. When tested on emerging markets, liquidity augmented FFTF model does well only in Indian Context. (Sehgal et. al. 2014)

Profitability, undoubtedly, is a determinant of security returns. However, there are contrasting theories which state that the relation may be positive (mature markets) or negative (developing markets). Fama-French (2008) has incorporated it in their asset pricing model using Return on Equity as a proxy. Returns on a security depict earnings of the firms which are closely dependent on its investment decisions. Fama & French (2006) as well as Singh & Yadav (2015) demonstrate an inverse relation between investment by a company and its stock returns. A high ratio depicts aggressive investment while a low ratio shows conservative investment.

Similar results across nations and time period on equity anomalies called for a revision of our traditional risk based models. Therefore, after almost a decade of its birth, Fama-French Three Factor model has further been augmented to Fama-French Five Factor Model (FFFF) by inculcating profitability and investment factors. However, the FFFF model is still being subject to rigorous testing and research for universal applicability and reliability. Sehgal et. al (2014) and Singh & Yadav (2015) find that FFTF model is still working well in India and other emerging markets. Five factor model does better when portfolios are formed on variables not included in three factor model. Some other prominent works are Maiti & Balakrishnan (2018) Das & Mahakud (2015) which presents a comprehensive picture on asset pricing models and anomalies in Indian stock markets. All the anomalous relations of CAPM and FFTF model and limitations of Five-factor model call for further research to build a robust multifactor model.

As evident in all the studies referred above, prominent anomalies like size, value, prior return and accruals have been intensively researched in emerging markets but others are yet to find some depth in their empirical

evidence. Some great advancement in this direction has been Patel (1988), Rowenhorst (1999), Pasaribu (2009), Vu (2012), Hoffman (2012), Chen, Kim, Yao & Yu (2010), Sobti (2018) and Pandey (2020).

Concurrent research is underway on development of a Multifactor asset pricing model in context of Emerging markets. Balakrishnan, Maiti and Panda (2018) concluded that all the four firm fundamentals used in five factor asset pricing model are a significant determinant of returns. It states that the FFTF model still holds ground despite of various multifactor models being developed recently. Singh & Yadav (2015) presents a comparative view of CAPM, FFTF, Fama French Five Factor model on Indian stock markets by using time series hierarchical multiple regression on CNX 500 companies during 1999-2014. Four factor model (excluding investment) is better than FFFF model. Sehgal, Subramaniam & Desting (2014) tests prominent equity market anomalies for six emerging markets, namely, Brazil, India, China, South Africa, Indonesia and South Korea. Its results based on Fama French Three Factor Model show that size, value and liquidity anomaly is present in Korea, while size, momentum and stock repurchases anomaly is revealed in India. Dedicated research is also available on both the countries. Pandey (2020) studied the five popular anomalies in Indian equity market from July 2001 to June 2019 and found that though all the anomalies - size, value, profitability, investment and momentum are present in Indian markets, the size and value anomaly yield substantially significant returns. It found three factor model to be the relevant model for India as CAPM fails to explain alpha while the four and five factor model don't add any explanatory power to stock returns.

Han, Lee and Kang (2020) worked on 148 anomalies to study the performance of the Korea Stock Exchange. They found 57 equity anomalies to have statistically significant returns at 5% level of significance. They emphasise on the role of microcap stocks on anomaly returns. The study suggests use of value weighted portfolios and exclusion of microcaps from the sample. It gives pertinent conclusion related to tactical asset allocation by use of equity anomalies in a creative way, for instance, factor returns are cyclical and thus can be used on rotation basis to build profitable strategies. Kim, Kang and Roh (2024) tests the presence of 26 anomalies in Korea using a mispricing measure. It finds that trading behaviour of individual investors (noise traders) generates anomalies. The institutional investors and foreign investors are more sophisticated than retail traders and thus make profits using anomalies. The review of literature gives insight about the need to study anomalies in light of a more relevant asset pricing model which is capable of explaining security returns.

Research Questions

In light of the survey of literature and thought process developed thereafter, this research has the following questions:

- To re-examine the presence of select equity anomalies in India and Korea.
- To examine if Six factor model can explain stock returns in India and Korea.
- To find a parsimonious multifactor asset pricing model to explain security returns India and Korea.

Data & Research methodology

The population of interest for this research is emerging economies of the World. Using various parameters like size of economy, five leading emerging economies identified are China, India, Saudi Arabia, South Korea and Taiwan. China, being multiple times in market cap, was left out from the sample. Saudi Arabia, though similar in size, has scant data available to support research. So, this leaves us with the two sample countries chosen. India and Korea have a nearly comparable size also. The paper analyses presence of prominent anomalies – size, value, profitability, investment and turnover, using the six factor model.

Data for the study will comprise of monthly closing stock prices of all the companies listed on leading stock exchanges – National Stock Exchange (NSE) and Korea Stock Exchange (KSE). Risk free rate of return will be proxied by country-specific short term interest rates as available on the website of OECD (Organisation for Economic Co-operation and Development). It is an additional contribution of this paper over available literature which uses US treasury-bill (t-bill) rate for all emerging markets. Authors believe that use of US treasury bill rate will result in underestimation of excess returns because interest rates are on higher side of spectrum for emerging markets viz.-a-viz. developed nations like US. Independent variables used in the study are proposed to be measured as follows:

Table: 2 Independent factor variables and their measurement

Variable	Metric
Market	Return Premium
Size	Market Capitalization
Value	Price to Book Ratio
Profitability	Return on equity
Investment	Change in assets to total assets ratio
Turnover	Trading Volume (as % of market float)

Source: Authors' compilation

Methodology involves creation of double-sorted quintile portfolios using the five variables chosen for the study. The asset pricing model used should be able to explain the average portfolio returns. Presence of abnormal portfolio returns, i.e., in excess of expected returns indicates towards existence of an anomaly. The whole research design uses multiple regression tools and portfolio formulation as per Fama-French (2015) methodology.

All the securities in a market are sorted on a chosen variable, say, size on 30th June each year. Using Fama-French approach, Median is used for first bifurcation based on size and then within large size companies, 30th and 70th percentile is used to create 3 portfolios. This gives 6 (2×3) independent portfolios. Secondly, 25 (5×5) dependent portfolios are created using double sorting and quintiles. Monthly portfolio returns are then calculated from closing stock prices for the period of July to June of next year.

Independent factor variables are computed as follows:

SMB = Average return of 12 small stock portfolios - Average return of 12 large stock portfolios

$$SMB\ (Small\ Minus\ Big)\ = \frac{1}{3}\ (SMB_{VAL} + SMB_{PROF} + SMB_{INV} + SMB_{TURN})$$

Where,

$$SMB_{VAL} = \tfrac{1}{3}\ (SV + SN + SG) - \tfrac{1}{3}\ (BV + BN + BG)$$

$$SMB_{PROF} = \frac{1}{3}\ (SR + SN + SW) - \frac{1}{3}\ (BR + BN + BW)$$

$$SMB_{INV} = \frac{1}{3}\ (SC + SN + SA) - \frac{1}{3}\ (BC + BN + BA)$$

$$SMB_{TURN} = \frac{1}{3}\ (SI + SN + SL) - \frac{1}{3}\ (BI + BN + BL)$$

Similarly,

$$HML\ (High\ Minus\ Low) = \frac{1}{2}\ (SV + BV) - \frac{1}{2}\ (SG + BG)$$

$$RMW\ (Robust\ Minus\ Weak) = \frac{1}{2}\ (SR + BR) - \frac{1}{2}\ (SW + BW)$$

$$CMA\ (Conservative\ Minus\ Aggresive) = \frac{1}{2}\ (SC + BC) - \frac{1}{2}\ (SA + BA)$$

$$IML\ (Illiquid\ Minus\ Liquid) = \frac{1}{2}\ (SI + BI) - \frac{1}{2}\ (SL + BL)$$

Thereafter, dependent portfolio returns are regressed on factors using six factor model. The excess returns on each of the portfolio must be fully explained, otherwise it indicates towards presence of anomaly.

$$R_i - R_f = \alpha_i + \beta_i[R_m - R_f] + s_i SMB_t + h_i HML_t + r_i RMW_t + i_i CMA_t + \mu_i$$

…… (Fama French Five Factor Model) (Equation 1)

Similar procedure is followed for rest of the variables also. To test for turnover anomaly, i.e., less liquid stocks outperform more liquid stocks, the above equation is applied on liquidity sorted portfolios. In presence of the anomaly, equation 1 is extended by adding a liquidity factor (IML_t) as in the following equation:

$$R_i - R_f = \alpha_i + \beta_i[R_m - R_f] + s_i SMB_t + h_i HML_t + r_i RMW_t + i_i CMA_t + l_i IML_t + \mu_i$$

…… (Six Factor Model) (Equation 2)

Hypotheses

This study uses the following alternate hypotheses to answer its research questions:

H1: Stocks of small firms outperform those of large size firms.

H2: Stocks of value firms (low P/B ratio) outperform those of growth firms (high P/B ratio).

H3: Stocks of weak profitability firms outperform those with robust profitability.

H4: Stocks of firms with low investment outperform those with high investment.

H5: Less Liquid stocks outperform more liquid stocks.

H6: Six-factor asset pricing model can fully explain returns on stocks.

H7: Six factor asset pricing model performs better than Fama-French Model(s).

The first five hypotheses correspond to the first research question and so on for the second and third research question.

Results & Empirical Discussion

The discussion on results of generalised least square regression are presented in this section. In each table, 25 dependent portfolio regression coefficients and intercepts are mentioned with their p-values. The portfolio 1 being winner portfolio and portfolio 5 being loser portfolio in all cases of value, profitability, investment and turnover. Prima facie, anomalies are more prominent in Korean markets. Small company portfolios show

significantly high return in Korea only. This is a marked departure from past literature which shows size effect in India. It may be due to use of a true representative as risk-free rate of return which is higher than the US t-bill rate used in past literature. It has led to disappearing of size effect. Indian stock markets show only profitability and turnover effect. It means the high earning numbers and low stock turnover in the trading market is a good identifier of investment options in Indian Stock markets. As expected, market premium is still the prominent factor represented by highly significant p-value in both the countries. On the other hand, Korean stock markets seem to be characterised by all anomalies except turnover effect.

Univariate results shown in descriptive statistics (Table 3) point towards positive excess returns on all anomalies in Korea. Profitability effect yielding the highest returns to the tune of 1.02%. Small firms yield 0.51% more than the large firms. Value investing in Korean markets is also equally promising because it gives 0.64% more by investing in low P/B value stocks than high P/B stocks. Equity of firms with conservative investment strategy earns 0.46% more returns than those with aggressive investment strategy. It implies that we can reject the first four null hypotheses for Korea.

Table: 3 Average factor returns and their p-value

Mean and S.D. of factor returns						
INDIA	Mrkt	SMB	HML	RMW	CMA	IML
Mean	-4.913	0.5547	0.3489	0.6778	-0.0329	0.5185
S.D.	6.3903	3.9816	3.2432	2.8507	1.8279	2.6536
S.E. (mean)	0.6527	0.4067	0.3313	0.2912	0.1867	0.2711
t (mean)	-7.533	1.3649	1.054	2.3295	-0.1764	1.9145
p-value	**0.00**	0.18	0.29	**0.02**	0.86	**0.05**
KOREA						
Mean	-1.5161	0.5104	0.6439	1.0219	0.4568	0.0141
S.D.	6.6778	2.4057	2.9296	2.4232	1.9428	2.9371
S.E. (mean)	0.6821	0.2457	0.2992	0.2475	0.1984	0.3000
t (mean)	-2.2244	2.0789	2.1536	4.1319	2.3036	0.0469
p-value	**0.03**	**0.04**	**0.03**	**0.00**	**0.02**	0.96

Source: Authors' Calculation

So, Korean stock markets have presence of the four anomalies – size, value, profitability and investment. Whereas, p-value for fifth hypothesis is 0.96 so we don't reject the null hypothesis that stock returns of illiquid firms outperform liquid firms. Our results deny presence of turnover effect in Korea. Indian markets also reveal a strong profitability effect with average excess returns of 0.68% having a p-value of 0.02. Similarly, investors can also make more money by investing in firms having low liquidity in stock markets. A p-value of 0.05 makes the turnover effect significant. Therefore, our results reject third and fifth null hypothesis for Indian Stock markets.

Refer Table 4 here

Turnover factor being significant in one of the countries gives ample ground for testing its ability to explain security returns. We test the sixth hypothesis that six factor model can explain security returns. In panel A of Table 4, the absence of significant alpha in majority of the 100 dependent portfolios shows that at 5% level of significance, we reject the null hypothesis – "six factor model can't fully explain security returns". So, the six-factor model developed by augmenting Fama-French five factor model with turnover factor is found suitable to explain the return in all the case of size-value portfolios, size-investment portfolios, size-profitability portfolios and size-turnover portfolios. However, as an exception, highly significant p-values in corner portfolios indicates six factor model has difficulty explaining high returns generated by some of the lowest and highest quintiles. The beta coefficients and size coefficient are significant in all cases so, market premium and size of company still remain the most prominent explanatory variable for security returns. The value coefficients are mostly significant towards the section of low P/B ratio portfolios only. It means that the new model is not suitable for growth stocks. The new addition to this list is the turnover factor which comes out to be significant in most Indian portfolios. The turnover coefficients are mostly negative and significant (p value < 0.05) which means that there is an inverse relation between liquidity in stock market and stock's returns. An additional observation pinpoints an investment strategy for readers. In panel B, the intercepts of the model are significant at 5% level for corner portfolios representing small size-growth stocks and big size-value stocks. Similarly, in Panel D, small size-illiquid stocks generate significant excess returns for investors in Indian stock markets.

The value factor and investment factor seem to be present but weak in Indian stock markets as the results show only a few significant coefficients. Profitability factor is also not very significant in explaining returns in Indian stock markets. Though weak profitability firms are showing significant profit coefficients irrespective of size of

the firm, but size-profitability portfolios depict insignificant profit coefficient. The intercept on size-profitability sort portfolios is not significant for 22 out of 25 portfolios in panel C below. The turnover or stock liquidity factor has explanatory power because the six factor model is able to explain 24 out of 25 size-turnover sorted portfolio returns shown in panel D.

Refer Table 5 here

Moving on to Korean counterpart of Indian stock markets, the first observation is that in Korean stock market, there is presence of significant excess returns on 51 out of 100 portfolios. So, the investors have wider options for formulating their investment strategy based on anomalies. Panel A of Table 5 shows results for regression run on size-value double sorted portfolios. Six factor model gives mixed results here. It seems successful to a large extent in explaining small and big portfolio returns though the middle quantiles show unexplained returns. In panel B, C and D of Table 5, results present a different picture where the six factor model doesn't seem to do well for middle sized quintiles of dependent portfolios. Similar to the factor variable results, turnover anomaly is found to be significant at 5 % level for majority of dependent portfolios created based on size-value, size-investment, size-profitability and size-turnover sorting of Korean stocks. Turnover factor is significant for 73 out of 75 bivariate portfolios created using factors other than turnover. This depicts the relevance of turnover, as an indicator of liquidity, in creation of the Six factor model. Therefore, we don't have a strong evidence to reject the sixth null hypothesis in Korean markets. The six factor model is not able to fully explain all portfolio returns in Korea.

Refer Table 6 here

The six factor pricing model performs poorer in Korean market as is evident from the significant intercepts of regression equation indicating presence of unexplained excess returns on Korean stocks. Size-turnover sorted portfolios are promising here also as shown by highly significant turnover coefficient, especially for illiquid portfolios. Lastly, the average values of Adjusted R^2 of regression equations is lower for Korean stock portfolios when compared to Indian Stock portfolios. Table 6 shows comparative analysis of the three-factor model, five factor model and the six-factor model used in the study. Results indicate that, on an average, six factor model can explain 83% of the portfolio return in India whereas only 74% of return is explained by the six factor model. It can be concluded that the Six-factor model performs better for India while there is only marginal improvement for Korea.

Conclusion & Future scope

This study done on eight years' data of National Stock Exchange and Korean Stock Exchange gives useful insights on equity market anomalies of these two leading emerging stock markets. The empirical results throw sufficient light on the objectives of the study. The results show prevalence of only profitability effect and turnover effect in India, whereas, Korea depicts all but turnover anomaly. The profitability anomaly has the highest return in both the emerging markets. The new model is capable of explaining majority of portfolio returns in this study. It implies that investors need to shift to six-factor model to estimate expected returns of their portfolios rather than the traditional models. This research work also tells that the turnover augmented six factor model is performing better in explaining returns on securities in India as compared to Korea. When looking at Korean markets, the abnormal returns are lower than India but all the anomalies except turnover are present in their stock markets. So, this study concludes that the emerging markets still show asset pricing anomalies. It implies that investors and portfolio managers can exploit them to generate higher investment returns. Moreover, the policy makers of these countries need to take into account the anomalies while taking initiatives to enhance the market microstructure of stock exchanges.

ANNEXURES

Table:4 Regression Coefficients of Six Factor Model on 25 Indian portfolios

Panel A Size-value portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-1.0735	-0.3544	-0.5995	-0.4329	-0.3155	**0.01**	0.43	0.16	0.35	0.43
2	-0.1697	-0.5041	-0.0160	0.2890	-0.2329	0.68	0.30	0.97	0.55	0.60
3	-0.2876	-0.0181	-0.1342	-0.0865	-0.4870	0.52	0.97	0.77	0.85	0.30
4	0.1371	-0.2134	-0.4375	-0.0733	-0.6464	0.78	0.64	0.42	0.86	0.17
Big	-0.2519	-0.4485	-0.2361	-0.3033	-0.8312	0.51	0.16	0.42	0.39	**0.02**
	Beta					p value				
Small	0.8546	1.0024	0.9104	0.9259	0.8611	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.0095	1.0599	1.0726	1.0850	1.0497	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	1.0085	1.0950	1.0799	1.0903	1.0424	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	1.1463	1.0098	0.9833	1.0284	1.0135	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	0.9989	0.9546	0.9251	0.9869	0.8861	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	1.4656	1.7641	1.9070	1.5850	1.5285	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.3405	1.1933	1.2845	1.3702	1.2952	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.6805	0.9011	0.9265	0.9121	1.1992	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.3516	0.3975	0.5417	0.5374	0.5622	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**
Big	-0.0373	0.1810	0.2612	0.2562	0.3537	0.74	**0.05**	**0.00**	**0.01**	**0.00**
	H					p value				
Small	0.8824	0.4571	0.2444	0.3226	0.0634	**0.00**	**0.05**	0.26	0.18	0.75
2	0.6026	0.6426	0.5599	-0.0470	-0.0149	**0.00**	**0.01**	**0.03**	0.85	0.95
3	1.1874	0.6235	0.5745	0.2322	-0.1302	**0.00**	**0.01**	**0.01**	0.30	0.59
4	0.9473	0.7263	0.3634	0.1830	-0.0529	**0.00**	**0.00**	0.19	0.39	0.82
Big	0.8289	0.2540	-0.0279	-0.1811	-0.4673	**0.00**	0.11	0.85	0.31	**0.01**
	P					p value				
Small	-0.5803	-0.3358	-0.2438	-0.1296	-0.4512	**0.01**	0.14	0.27	0.58	0.03
2	-0.5339	0.0913	0.1985	-0.1526	-0.0214	**0.01**	0.71	0.43	0.54	0.93
3	-0.3212	0.1098	-0.1460	-0.2768	-0.3898	0.16	0.66	0.53	0.22	0.11
4	-0.0236	-0.0320	-0.3315	-0.5148	-0.2087	0.93	0.89	0.23	**0.02**	0.38
Big	-0.1357	-0.1730	-0.1959	-0.2265	-0.1663	0.49	0.28	0.19	0.20	0.36
	I					p value				
Small	0.3398	0.3934	0.4817	0.5321	0.5982	0.23	0.18	**0.08**	**0.08**	**0.02**
2	0.8541	0.1020	0.5407	0.6727	0.4749	**0.00**	0.75	0.09	**0.03**	0.10
3	0.7521	0.7253	0.9078	0.7991	1.0607	**0.01**	**0.03**	**0.00**	**0.01**	**0.00**
4	0.4453	0.5354	0.9196	0.7959	0.5194	0.17	0.07	**0.01**	**0.00**	0.09
Big	0.2800	0.3742	0.4606	0.3778	0.0639	0.26	0.07	**0.02**	0.10	0.78
	T					p value				
Small	0.2888	-0.0814	-0.3859	-0.3503	-0.2125	**0.03**	0.56	**0.00**	**0.02**	0.09
2	-0.6010	-0.5028	-0.6826	-0.7484	-0.5076	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	-0.6248	-0.5149	-0.7069	-0.6291	-0.6756	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	-0.6807	-0.4956	-0.5311	-0.4405	-0.4068	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Big	-0.5549	-0.2654	-0.3047	-0.0707	-0.1528	**0.00**	**0.01**	**0.00**	0.51	0.17

Source: Author's calculation

Panel B Size-Profitability portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-0.0895	0.2755	-0.5224	-0.6345	-1.8348	0.86	0.53	0.28	0.15	**0.00**
2	0.0382	-0.3134	0.0553	-0.2532	-0.1432	0.94	0.48	0.91	0.60	0.77
3	-0.0666	0.0257	0.0592	-0.1479	-0.8805	0.89	0.96	0.90	0.75	0.06
4	-0.9025	-0.3027	-0.0901	-0.0206	0.0849	0.07	0.51	0.86	0.96	0.58
Big	-0.9103	-0.6204	-0.5098	-0.3868	0.2809	**0.05**	**0.05**	0.09	0.18	0.48
	Beta					p value				
Small	0.9026	0.9619	0.9148	0.9372	0.8322	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.0844	1.0253	1.1234	0.9726	1.0697	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	1.1163	1.1099	0.9972	1.0676	1.0279	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.9902	0.9681	1.0521	1.0789	1.0955	**0.00**	**0.00**	**0.00**	**0.00**	0.87
Big	0.9238	0.9481	0.8892	0.9607	1.0174	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	1.6044	1.6591	1.5616	1.7152	1.7164	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.2995	1.3816	1.3314	1.1725	1.2977	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.9791	1.0631	0.9977	0.8520	0.7215	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.5068	0.5772	0.4192	0.3214	0.5621	**0.00**	**0.00**	**0.01**	**0.02**	**0.00**
Big	0.2749	0.2112	0.2935	0.1696	0.0376	**0.02**	**0.02**	**0.00**	**0.05**	0.75
	H					p value				
Small	0.7516	0.2431	0.5786	0.2805	0.1216	**0.00**	0.27	**0.02**	0.21	0.61
2	0.5094	0.4022	0.1496	0.5335	0.1633	**0.05**	0.07	0.53	**0.03**	0.51
3	0.5115	0.4309	0.2244	0.5550	0.7781	**0.03**	0.07	0.34	**0.02**	**0.00**
4	0.5143	0.3035	0.5475	0.5623	0.2493	**0.04**	0.19	**0.03**	**0.02**	0.36
Big	-0.0198	0.0993	-0.0825	0.1603	0.2906	0.53	0.53	0.58	0.28	0.15
	P					p value				
Small	0.4201	-0.2542	-0.3870	-0.6147	-0.9220	0.09	0.25	0.11	**0.01**	**0.00**
2	0.5627	0.3385	0.0780	-0.4640	-0.9603	**0.03**	0.13	0.74	0.06	**0.00**
3	0.2037	0.1409	-0.2915	-0.3836	-0.7024	0.39	0.56	0.21	0.11	**0.00**
4	0.1566	-0.1471	0.0404	-0.3857	-0.7775	0.53	0.53	0.87	0.10	**0.01**
Big	0.1245	0.1687	-0.1514	-0.2419	-0.8221	0.28	0.28	0.31	0.10	**0.00**
	I					p value				
Small	0.7464	0.4070	0.5938	0.7164	-0.1134	**0.02**	0.15	0.06	**0.01**	0.71
2	0.3730	0.4600	0.2398	0.8869	0.7039	0.25	0.11	0.43	**0.01**	**0.03**
3	0.8747	0.8830	0.8886	0.9291	0.6508	**0.00**	**0.00**	**0.00**	**0.00**	**0.03**
4	0.6497	0.7208	0.8382	0.5774	0.4249	**0.04**	**0.02**	**0.01**	**0.05**	0.22
Big	-0.1528	0.2423	0.2922	0.4010	0.5341	0.23	0.23	0.13	**0.03**	**0.04**
	T					p value				
Small	-0.3085	-0.3531	-0.1327	0.0671	-0.0192	**0.05**	**0.01**	0.37	0.62	0.89
2	-0.5432	-0.6790	-0.5896	-0.7553	-0.4703	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	-0.5757	-0.7016	-0.7115	-0.5906	-0.5665	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	-0.4659	-0.4732	-0.4383	-0.3927	-0.7787	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**
Big	0.0995	-0.0546	-0.2758	-0.2773	-0.6169	0.57	0.57	**0.00**	**0.00**	**0.00**

Source: Author's calculation

Panel C Size-Investment portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	0.4465	-0.2693	-0.9571	-1.1033	-0.8748	0.25	0.57	**0.03**	**0.01**	0.06
2	-0.5674	-0.0807	0.0446	0.1218	-0.1423	0.21	0.86	0.93	0.78	0.79
3	-0.8373	-0.2318	0.1359	-0.2647	0.2232	0.07	0.57	0.77	0.57	0.62
4	-0.3998	-0.0329	-0.5456	-0.4061	0.1639	0.38	0.95	0.25	0.34	0.73
Big	-0.3982	-0.6327	-0.2632	-0.4559	-0.2779	0.31	**0.04**	0.39	0.12	0.40
	Beta					p value				
Small	0.8693	0.9281	0.9092	0.9291	0.9185	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.0349	1.0687	1.0601	1.0521	1.0605	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	1.0255	1.0309	1.0727	1.0877	1.1026	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	1.0679	1.0825	0.9675	0.9867	1.0809	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	1.0111	0.9162	0.9327	0.9133	0.9800	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	1.4627	1.6200	1.7994	1.6934	1.6813	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.3485	1.3852	1.2753	1.2228	1.2506	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	1.1035	0.9450	0.9229	0.8250	0.8186	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.5977	0.4403	0.3383	0.5100	0.5021	**0.00**	**0.01**	**0.02**	**0.00**	**0.00**
Big	0.2304	0.2747	0.1771	0.2245	0.1047	**0.05**	**0.00**	**0.05**	**0.01**	0.28
	H					p value				
Small	0.6632	0.4104	0.5026	0.3482	0.0418	**0.00**	0.09	**0.03**	0.10	0.86
2	0.4297	0.3049	0.3855	0.2319	0.4087	0.06	0.20	0.12	0.30	0.13
3	0.3865	0.4008	0.3872	0.8179	0.5021	0.10	0.06	0.10	**0.00**	**0.03**
4	0.5071	0.2978	0.6650	0.3632	0.3391	**0.03**	0.28	**0.01**	0.09	0.17
Big	0.0340	-0.0385	0.0156	0.0891	0.3098	0.86	0.80	0.92	0.55	0.06
	P					p value				
Small	-0.6399	-0.2254	-0.2843	-0.2277	-0.3680	**0.00**	0.35	0.21	0.28	0.12
2	0.1275	-0.0783	-0.0547	-0.1839	-0.2412	0.58	0.74	0.82	0.41	0.36
3	-0.3358	-0.1084	-0.1302	-0.0582	-0.4026	0.15	0.60	0.58	0.81	0.08
4	-0.1581	-0.3489	-0.1798	-0.0049	-0.4199	0.50	0.20	0.46	0.98	0.09
Big	-0.2872	-0.0564	-0.2347	-0.1310	-0.1577	0.15	0.72	0.13	0.38	0.34
	I					p value				
Small	1.6893	0.3906	0.7245	-0.0389	-0.4293	**0.00**	0.21	**0.01**	0.89	0.16
2	0.6092	0.9113	0.6595	0.1635	0.3222	**0.04**	**0.00**	**0.04**	0.57	0.34
3	1.6269	1.0185	0.7418	0.5522	0.2895	**0.00**	**0.00**	**0.01**	0.07	0.33
4	1.0798	1.0452	0.8750	0.0919	0.1144	**0.00**	**0.00**	**0.01**	0.74	0.71
Big	0.6708	0.3338	0.2825	0.1604	0.0669	**0.01**	0.10	0.16	0.40	0.75
	T					p value				
Small	-0.1694	-0.2357	-0.0625	-0.1673	-0.1097	0.16	0.11	0.65	0.20	0.45
2	-0.6245	-0.6215	-0.6359	-0.5913	-0.5683	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	-0.7126	-0.6269	-0.6525	-0.6234	-0.5308	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	-0.4229	-0.4518	-0.5395	-0.5852	-0.5439	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**
Big	-0.2452	-0.1835	-0.2041	-0.4128	-0.2904	**0.04**	0.06	**0.03**	**0.00**	**0.01**

Source: Author's calculation

Panel D Size-Turnover portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-1.1717	0.2064	-0.1752	-0.8787	-0.7381	**0.02**	0.64	0.65	0.06	0.07
2	-0.2889	-0.0198	0.2056	-0.2659	-0.2733	0.53	0.97	0.69	0.59	0.56
3	-0.6379	0.2780	-0.3705	-0.0324	-0.2330	0.16	0.58	0.42	0.95	0.63
4	-0.7483	0.1689	-0.1432	-0.3337	-0.1685	0.13	0.72	0.78	0.49	0.69
Big	-0.1301	-0.4532	-0.3942	-0.5207	-0.5321	0.73	0.12	0.20	0.09	0.16
	Beta					p value				
Small	0.8643	0.9505	0.9872	0.9171	0.8353	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.0771	1.0185	1.1170	1.0044	1.0565	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	1.0720	1.0922	1.0465	1.0665	1.0401	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.9971	1.0487	1.0273	1.0429	1.0693	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	0.9733	0.9149	0.9761	0.9312	0.9576	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	1.2622	1.8777	1.7407	1.6022	1.7834	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	1.2992	1.1688	1.4180	1.2989	1.2976	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.7872	1.0703	0.9412	0.8341	0.9818	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.5301	0.5221	0.4165	0.4171	0.5047	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**
Big	0.2177	0.2573	0.1030	0.1787	0.2515	**0.05**	**0.00**	0.26	**0.05**	**0.03**
	H					p value				
Small	0.8286	0.1073	0.5954	0.5158	-0.0937	**0.00**	0.63	**0.00**	**0.03**	0.65
2	0.2902	0.4775	0.1113	0.5429	0.3443	0.21	**0.04**	0.67	**0.03**	0.15
3	0.7583	0.1370	0.3184	0.7533	0.5285	**0.00**	0.59	0.18	**0.00**	**0.04**
4	0.1856	0.3318	0.4941	0.6145	0.5514	0.46	0.16	0.06	**0.01**	**0.01**
Big	-0.0093	-0.1182	0.2360	0.1265	0.1753	0.96	0.42	0.13	0.41	0.36
	P					p value				
Small	-0.1776	-0.6748	-0.2998	-0.1135	-0.4816	0.49	**0.00**	0.13	0.63	**0.02**
2	0.0222	-0.1315	-0.1664	-0.0069	-0.1454	0.92	0.57	0.53	0.98	0.54
3	-0.0093	-0.3492	-0.1924	-0.3444	-0.1292	0.97	0.17	0.41	0.16	0.60
4	-0.2744	-0.2785	-0.1819	-0.0293	-0.3398	0.27	0.24	0.48	0.90	0.12
Big	-0.3301	-0.0969	-0.0509	-0.1345	-0.2587	0.08	0.51	0.74	0.38	0.18
	I					p value				
Small	0.0143	1.1144	0.3340	0.1899	0.7096	0.97	**0.00**	0.18	0.53	**0.01**
2	0.2297	0.6217	0.4572	0.6780	0.6845	0.44	**0.04**	0.18	**0.03**	**0.03**
3	0.8600	0.6874	0.7426	1.0459	0.9009	**0.00**	**0.04**	**0.01**	**0.00**	**0.01**
4	0.6264	0.6879	0.8487	0.4864	0.5626	**0.05**	**0.02**	0.01	0.12	**0.04**
Big	0.5955	0.1938	0.2694	0.3322	0.1236	**0.01**	0.30	0.17	0.10	0.61
	T					p value				
Small	0.7178	0.0607	-0.2083	-0.5194	-0.7963	**0.00**	0.66	0.08	**0.00**	**0.00**
2	-0.1445	-0.4669	-0.5886	-0.8926	-0.9501	0.31	**0.00**	**0.00**	**0.00**	**0.00**
3	-0.0117	-0.4656	-0.5959	-0.9847	-1.0967	0.93	**0.00**	**0.00**	**0.00**	**0.00**
4	0.6264	-0.2877	-0.4785	-0.6945	-0.8791	0.17	**0.05**	**0.00**	**0.00**	**0.00**
Big	0.1301	-0.0658	-0.1028	-0.3736	-0.9187	0.26	0.46	0.28	**0.00**	**0.00**

Source: Authors' Calculation

Table:5 Regression Coefficients of Six Factor Model on 25 Korean portfolios

Panel A Size-value portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-0.5166	-0.6691	-0.1598	-0.2950	-0.9779	0.23	0.09	0.75	0.52	**0.03**
2	-0.8289	-0.8256	-1.2709	-0.8277	-1.2025	**0.05**	**0.04**	**0.01**	0.06	**0.01**
3	-0.7654	-1.2712	-1.0140	-1.3584	-1.0950	0.07	**0.00**	**0.02**	**0.00**	**0.02**
4	-0.9464	-1.1271	-0.8954	-0.6909	-0.5506	**0.03**	**0.01**	0.07	0.13	0.29
Big	-0.6509	-0.3822	-0.5926	-0.6947	-0.9222	0.14	0.28	0.06	0.07	**0.01**
	Beta					p value				
Small	0.8442	0.8122	0.7511	0.8153	0.7677	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.7169	0.8539	0.8047	0.8556	0.8061	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.7818	0.8157	0.7953	0.7805	0.7529	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.8245	0.7591	0.7823	0.8013	0.7795	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	0.9063	0.8776	0.8040	0.8004	0.8928	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	1.0774	0.8128	1.0695	1.0223	1.3012	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.4919	0.5897	0.6626	0.7448	0.8637	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.0667	0.3367	0.2059	0.1961	0.2152	0.69	**0.05**	0.24	0.28	0.24
4	-0.1963	-0.3526	-0.2799	-0.3953	-0.3172	0.24	**0.03**	0.16	**0.03**	0.13
Big	-0.3633	-0.3168	-0.1247	-0.3212	-0.3322	**0.04**	**0.03**	0.32	**0.04**	**0.03**
	H					p value				
Small	0.7413	0.7566	0.7058	0.2398	-0.1419	**0.00**	**0.00**	**0.00**	0.28	0.51
2	0.9726	0.5875	0.6148	0.3782	-0.2725	**0.00**	**0.00**	**0.01**	0.07	0.18
3	0.9935	0.6692	0.6940	0.5705	-0.0085	**0.00**	**0.00**	**0.00**	0.01	0.97
4	1.0712	0.7758	0.5167	0.0960	-0.0513	**0.00**	**0.00**	**0.03**	0.66	0.83
Big	0.9560	0.7885	0.4296	-0.1076	-0.3832	**0.00**	**0.00**	**0.00**	0.55	**0.03**
	P					p value				
Small	-0.3659	-0.6956	-0.7550	-0.6674	-0.5336	0.08	**0.00**	**0.00**	**0.00**	**0.02**
2	-0.6176	-0.3517	-0.4798	-0.7021	-0.4658	**0.00**	0.07	**0.03**	**0.00**	**0.03**
3	-0.6253	-0.3413	-0.7517	-0.5890	-0.6960	**0.00**	0.09	**0.00**	**0.01**	**0.00**
4	-0.6499	-0.8018	-0.3917	-0.6062	-0.5899	**0.00**	**0.00**	0.10	**0.01**	**0.02**
Big	-0.6560	-0.7078	-0.4395	-0.2579	-0.2777	**0.00**	**0.00**	**0.00**	0.16	0.12
	I					p value				
Small	0.1131	0.5927	0.6307	0.3372	0.2733	0.68	**0.02**	**0.05**	0.25	0.35
2	0.5198	0.2315	0.2917	0.1458	0.2090	**0.05**	0.35	0.32	0.60	0.44
3	0.2612	0.0635	0.3699	0.4005	0.5369	0.32	0.81	0.19	0.17	0.06
4	0.3676	0.3405	0.2446	0.3689	0.3325	0.17	0.18	0.43	0.21	0.31
Big	0.2955	0.3012	0.2336	0.2761	0.5752	0.29	0.18	0.23	0.26	**0.02**
	T					p value				
Small	-0.5725	-0.6209	-0.9517	-0.8136	-0.5481	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**
2	-0.8770	-0.7651	-0.9465	-0.6375	-0.5557	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
3	-0.8004	-0.8325	-0.9132	-0.9612	-0.7222	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	-0.8395	-0.8335	-0.8484	-0.6908	-0.8457	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	-0.7048	-0.6477	-0.5764	-0.4709	-0.3705	**0.00**	**0.00**	**0.00**	**0.01**	**0.04**

Source: Author's calculation

Panel B Size-Profitability portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-0.0295	-0.5724	0.0509	-0.6463	-1.0299	0.95	0.31	0.90	0.10	**0.02**
2	-1.3068	-0.7298	-1.0113	-1.0227	-0.8677	**0.00**	0.10	**0.03**	**0.03**	**0.05**
3	-0.8727	-0.9523	-1.0808	-1.0374	-1.6092	**0.05**	**0.02**	**0.01**	**0.01**	**0.00**
4	-0.8730	-1.0168	-1.1159	-0.6013	-0.5899	**0.05**	**0.02**	**0.01**	0.21	0.27
Big	-1.1771	-0.6482	-0.6330	-0.4988	-0.3081	**0.00**	0.08	0.08	0.20	0.45
	Beta					p value				
Small	0.8055	0.7997	0.8269	0.7263	0.8498	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.7372	0.8250	0.8046	0.8393	0.8308	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.8159	0.7636	0.7678	0.7859	0.7901	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.7718	0.8343	0.7639	0.7875	0.7858	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	0.8667	0.8265	0.7936	0.8863	0.8942	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	0.8928	1.2411	1.1025	1.1020	1.1079	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.5553	0.3997	0.6119	0.7108	1.0823	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**
3	0.2339	0.2574	0.1867	0.3301	0.0204	0.19	0.10	0.26	**0.04**	0.91
4	-0.0857	-0.2333	-0.1453	-0.4735	-0.6031	0.63	0.16	0.37	**0.02**	**0.01**
Big	-0.1643	-0.2530	-0.2369	-0.3717	-0.4112	0.29	0.09	0.10	**0.02**	**0.01**
	H					p value				
Small	0.4779	0.7663	0.3145	0.4656	0.0292	**0.02**	**0.00**	0.09	**0.01**	0.89
2	0.7125	0.5232	0.5109	0.6774	-0.1427	**0.00**	**0.01**	**0.02**	**0.00**	0.50
3	0.5534	0.6499	0.6226	0.3786	0.6606	**0.01**	**0.00**	**0.00**	**0.05**	**0.00**
4	0.4524	0.3342	0.3193	0.5759	0.7295	**0.04**	0.09	0.10	**0.01**	**0.00**
Big	0.0164	0.1747	0.2804	0.5106	0.7308	0.93	0.32	0.10	**0.01**	**0.00**
	P					p value				
Small	-0.0165	-0.3087	-0.5477	-1.0450	-1.1274	0.94	0.25	**0.00**	**0.00**	**0.00**
2	-0.1711	-0.3675	-0.3389	-0.6594	-1.0731	0.37	0.08	0.12	**0.00**	**0.00**
3	-0.0287	-0.3498	-0.4825	-0.8359	-1.2844	0.89	0.07	**0.02**	**0.00**	**0.00**
4	0.0092	-0.3289	-0.3995	-0.7467	-1.5622	0.97	0.10	**0.04**	**0.00**	**0.00**
Big	-0.1958	-0.3143	-0.4407	-0.5922	-0.7881	0.29	0.08	**0.01**	**0.00**	**0.00**
	I					p value				
Small	0.2554	0.3603	0.2535	0.6234	0.4341	0.35	0.31	0.31	**0.01**	0.13
2	0.3873	0.2496	0.3344	0.3668	0.0622	0.12	0.37	0.25	0.20	0.82
3	0.3192	0.3093	0.1755	0.3513	0.4704	0.26	0.22	0.50	0.17	0.10
4	0.2297	0.5125	0.1745	0.1371	0.5668	0.42	**0.05**	0.50	0.65	0.10
Big	0.6036	0.3683	0.2308	0.4511	-0.0196	**0.01**	0.12	0.31	0.07	0.94
	T					p value				
Small	-0.7619	-0.9701	-0.5643	-0.6209	-0.3521	**0.00**	**0.00**	**0.00**	**0.00**	0.11
2	-0.9686	-0.6519	-0.7987	-0.9055	-0.4497	**0.00**	**0.00**	**0.00**	**0.00**	**0.04**
3	-0.8107	-0.7553	-0.8484	-0.6076	-1.2030	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	-0.9908	-0.6838	-0.5164	-0.7505	-1.1200	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**
Big	-0.5091	-0.4607	-0.4609	-0.5519	-0.8116	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**

Source: Author's calculation

Panel C Size-Investment Portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-0.7679	-0.2639	0.0509	-1.0838	-0.5759	0.10	0.55	0.90	**0.01**	0.22
2	-0.8259	-0.9149	-0.8674	-0.9553	-1.3714	**0.04**	**0.04**	**0.03**	**0.04**	**0.00**
3	-0.8198	-1.0675	-0.9356	-1.3829	-1.3412	**0.05**	**0.02**	**0.03**	**0.00**	**0.00**
4	-0.9627	-0.8930	-0.7899	-1.0010	-0.5464	0.07	0.06	0.06	**0.02**	0.23
Big	-1.1044	-0.6289	-0.7000	-0.6777	-0.1293	**0.01**	0.07	**0.03**	0.08	0.74
	Beta					p value				
Small	0.7131	0.7798	0.8269	0.7835	0.8843	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.7767	0.8271	0.7726	0.8623	0.7947	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.8415	0.7799	0.7940	0.7123	0.7633	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.8366	0.8043	0.7499	0.7626	0.7898	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	0.8438	0.8038	0.8297	0.8841	0.9047	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	0.9904	1.0139	1.1025	1.0772	1.0748	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.5875	0.8662	0.5533	0.6473	0.6787	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	-0.0201	0.4820	0.2192	0.2138	0.1316	0.90	**0.01**	0.21	0.20	0.44
4	-0.2979	-0.3564	-0.2558	-0.2547	-0.3988	0.16	0.06	0.12	0.14	**0.03**
Big	-0.2239	-0.2318	-0.2729	-0.2525	-0.4726	0.16	0.10	**0.04**	0.11	**0.00**
	H					p value				
Small	0.6101	0.6612	0.3145	0.6496	0.0687	**0.01**	**0.00**	0.09	**0.00**	0.76
2	0.5471	0.4933	0.3865	0.3883	0.4782	**0.00**	**0.02**	**0.04**	0.08	0.03
3	0.7173	0.4212	0.6005	0.5439	0.5993	**0.00**	**0.05**	**0.00**	**0.01**	**0.00**
4	0.6237	0.3538	0.2581	0.5523	0.6321	**0.01**	0.11	0.19	**0.01**	**0.00**
Big	0.1950	0.1319	0.2854	0.6097	0.4955	0.29	0.42	0.06	**0.00**	**0.01**
	P					p value				
Small	-0.6881	-0.6453	-0.5477	-0.4884	-0.6455	**0.00**	**0.00**	**0.00**	**0.02**	**0.01**
2	-0.8763	-0.3978	-0.4583	-0.3554	-0.5079	**0.00**	0.06	**0.02**	0.12	**0.02**
3	-0.5830	-0.5743	-0.6442	-0.4651	-0.7243	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**
4	-0.7137	-0.6169	-0.4284	-0.6660	-0.6151	**0.01**	**0.01**	**0.03**	**0.00**	**0.01**
Big	-0.2719	-0.3928	-0.3339	0.5799	-0.7681	0.15	**0.02**	**0.03**	**0.00**	**0.00**
	I					p value				
Small	0.8864	0.5777	0.2535	0.2458	-0.0253	**0.00**	**0.04**	0.31	0.37	0.93
2	1.0289	0.5486	0.1744	0.0144	-0.3814	**0.00**	**0.05**	0.48	0.96	0.18
3	0.8011	0.4001	0.2048	0.1989	0.0260	**0.00**	0.17	0.46	0.45	0.92
4	1.0336	0.7722	0.0579	0.1013	-0.3451	**0.00**	**0.01**	0.82	0.71	0.24
Big	0.9464	0.2817	0.2487	0.3353	-0.1794	**0.00**	0.20	0.21	0.18	0.47
	T					p value				
Small	-0.8779	-0.9333	-0.5643	-0.8205	-0.3148	**0.00**	**0.00**	**0.00**	**0.00**	0.17
2	-0.8379	-0.6505	-0.7173	-0.6593	-0.9342	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	-1.0030	-0.7273	-0.6411	-0.8476	-1.0259	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	-0.9526	-0.6329	-0.6956	-0.7692	-1.0190	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**
Big	-0.6025	-0.3743	-0.4997	-0.6016	-0.7327	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**

Source: Author's calculation

Panel D Size-Turnover portfolios										
	1	2	3	4	5	1	2	3	4	5
Six Factor Model	Alpha					p value				
Small	-0.5529	-0.3224	-0.3878	-0.4996	-0.8780	0.21	0.43	0.36	0.25	0.10
2	-1.0782	-0.8516	-0.9903	-1.0594	-0.9763	**0.01**	0.06	**0.02**	**0.02**	**0.03**
3	-0.8716	-0.9971	-0.8277	-1.2459	-1.6307	**0.02**	**0.02**	0.08	**0.01**	**0.00**
4	-1.2351	-0.8095	-0.9998	-0.5069	-0.6193	**0.01**	0.08	0.04	0.31	0.12
Big	-0.9455	-0.5524	-0.4821	-0.5348	-0.7181	**0.01**	0.09	0.19	0.15	0.06
	Beta					p value				
Small	0.8075	0.8615	0.8286	0.8327	0.6524	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.7259	0.8366	0.7879	0.8525	0.8353	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.6822	0.8346	0.8401	0.8204	0.7417	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
4	0.7730	0.8083	0.8133	0.7649	0.7858	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Big	0.7928	0.9016	0.8037	0.8830	0.8936	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	S					p value				
Small	0.8615	1.1126	0.9939	1.2251	1.0864	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2	0.4648	0.6102	0.7300	0.7597	0.7873	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
3	0.0448	0.1841	0.3344	0.2891	0.1784	0.76	0.27	0.08	0.13	0.30
4	-0.1000	-0.1079	-0.2942	-0.4111	-0.6422	0.57	0.56	0.12	**0.04**	**0.00**
Big	-0.1011	-0.2262	-0.2605	-0.2807	-0.5885	0.45	0.09	0.08	0.06	**0.00**
	H					p value				
Small	0.1304	0.3677	0.4114	0.6611	0.7401	0.53	0.06	**0.04**	**0.00**	**0.00**
2	0.4092	0.6823	0.6961	0.4342	0.0631	**0.03**	**0.00**	**0.00**	**0.04**	0.77
3	0.4315	0.6269	0.5684	0.6964	0.5565	**0.01**	**0.00**	**0.01**	**0.00**	**0.01**
4	0.4118	0.5674	0.5903	0.5782	0.2541	**0.05**	**0.01**	**0.01**	**0.02**	0.18
Big	0.3169	0.3846	0.6309	0.1751	0.1787	**0.05**	**0.01**	**0.00**	0.32	0.32
	P					p value				
Small	-0.6789	-0.5026	-0.6575	-0.7757	-0.3978	**0.00**	**0.01**	**0.00**	**0.00**	0.12
2	-0.4951	-0.6673	-0.4283	-0.5637	-0.4475	**0.01**	**0.00**	**0.04**	**0.01**	**0.04**
3	-0.5228	-0.7353	-0.4491	-0.6268	-0.6622	**0.00**	**0.00**	**0.05**	**0.01**	**0.00**
4	-0.4912	-0.6415	-0.4427	-0.8794	-0.5865	**0.02**	**0.00**	**0.05**	**0.00**	**0.00**
Big	-0.2925	-0.6348	-0.7314	-0.2815	-0.4002	0.07	**0.00**	**0.00**	0.12	**0.03**
	I					p value				
Small	0.2837	0.6338	0.0717	0.6594	0.2929	0.31	**0.02**	0.79	**0.02**	0.38
2	0.3528	0.4214	0.3743	0.4609	-0.2125	0.15	0.15	0.17	0.10	0.46
3	0.1330	0.4609	0.2784	0.4249	0.3410	0.57	0.08	0.36	0.16	0.21
4	0.2309	0.1290	0.2962	0.6912	0.2859	0.41	0.66	0.32	**0.03**	0.26
Big	0.0333	0.4266	0.5261	0.2165	0.4445	0.88	**0.04**	**0.02**	0.36	0.07
	T					p value				
Small	-0.0612	-0.3515	-0.5405	-0.8811	-1.6801	0.77	0.08	**0.01**	**0.00**	**0.00**
2	-0.1354	-0.6171	-1.0060	-0.8596	-1.1621	0.47	**0.01**	**0.00**	**0.00**	**0.00**
3	-0.2162	-0.5447	-0.8631	-1.0651	-1.5387	0.22	**0.01**	**0.00**	**0.00**	**0.00**
4	-0.1950	-0.5149	-0.8607	-1.0503	-1.4221	0.36	**0.02**	**0.00**	**0.00**	**0.00**
Big	-0.2243	-0.2805	-0.5801	-0.6914	-1.0024	0.17	0.07	**0.00**	**0.00**	**0.00**

Source: Author's calculation

Table: 6 Comparative analysis of Asset Pricing models using average Adjusted R^2

Model	India	Korea
Fama-French Three Factor Model	Adj. R^2 = 70.57%	Adj. R^2 = 68.57
Fama-French Five Factor Model	Adj. R^2 = 77.23%	Adj. R^2 = 70.32%
Six Factor Model	Adj. R^2 = 83.58%	Adj. R^2 = 74.61%

Source: Authors' calculation

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