The Impact of Institutional Development on Return Predictability in Pakistan

Abida Hafeez[1] Mohammad Nishat[2]

Abstract

This study analyzes the impact of institutional development on firm-specific return predictability using daily stock prices from 2004 to 2018. The objective of the present study is to investigate return volatility after the institutional development in the Pakistan Stock Exchange from 2009 onwards. The empirical research methodology adopted for firm-specific return predictability includes the Fama and French (FF) three-factor model (1992), the Augmented Fama and French (AFF) three-factor model, containing time-varying component, along with the Chow test for policy changes. The results exhibit a significant relationship between stock returns and risk during all sub-periods (non-reform period: January 2004 to June 2008, reform period I: January 2009 to December 2013, and reform period-II: January 2014 to December 2018). One of the significant findings of this study is that the time-varying component in betas is changing over time, which leads the researchers, security analysts, and portfolio managers to consider the time-varying risk factor in their analysis. It is also found that the volatility in return increases significantly during the second reform period (January 2014 to December 2018), which is a manifestation of institutional development and financial liberalization, a peculiar characteristic of emerging markets. Moreover, the Chow test and the coefficient of the dummy variable indicates a significant impact of institutional development and financial liberalization on return predictability. The results of the study are consistent with the behaviors of the emerging markets.

Keywords: Institutional development, Return predictability, Emerging market, Asset pricing models, Volatility, Reforms

Introduction

The predictability of asset return is rudimentary for a probe of the market and firm-specific characteristics in emerging markets. Emerging markets have important characteristics: high risk and high returns, and are more volatile than the developed financial markets (Bekaert & Harvey, 1997). During the 1980s, the Efficient Market Hypothesis (EMH) put up the theoretical base for much of the research, and most research studies throughout the decade concentrated on return predictability through historical stock prices, whereas other studies were undertaken to predict stock returns based on specific characteristics related to firm behavior, such as size (i.e. market capitalization or market equity-price of a stock times outstanding shares) and value (i.e.

[1] Applied Economics Research Centre, University of Karachi, E-mail: abida_aerc@yahoo.com
[2] Institute of Business Administration (IBA), Karachi, E-mail: mnishat@iba.edu.pk

ratio between book value and market value of a share) of a firm, depicted by SMB (i.e. Small Minus Big) and HML (i.e. High Minus Low) respectively, along with the market risk (Fama & French, 1996). Therefore, stock market efficiency, when stock prices are no more predictable and reflecting all available information (Fama, 1970), is largely contingent on institutional development, financial liberalization and technological modernization (Lagoarde-Segot & Lucey, 2008). However, it has been long-familiar that stock prices from emerging markets are characterized differently compared to developed markets. That is the reason that emerging market returns have characteristics of higher volatility and higher predictability of returns. Such characteristics of emerging markets highlight the need for financial liberalization/reforms and institutional development to perform as efficient markets.

After 1988, regulatory policy changes and institutional developments started in Pakistan. As a result, the Pakistan Stock Exchange (PSX) was characterized as an emerging market, with high returns and high volatility of stock returns (Nishat, 2000). According to Bekaert and Harvey (1997), and De Santis and Imrohoroglu (1997), the main motivation for liberalization/reforms is to attract foreign capital, which appears highly volatile in response to the changes in capital market reforms/liberalization. Volatility affects the development of financial markets significantly and supplies a stimulus for financial liberalization/reforms, development of financial institutions, portfolio management and options pricing (Poon & Granger, 2003). Financial liberalization/reforms and institutional development in Pakistan have increased the volatility of stock returns, which is an important factor in the pricing of the securities (Nishat, 2000).

Prior to the early 2000s, the capital inflow was tightened up due to bounded arbitrage, very high transaction costs, lacking liquidity, inadequate response to various fiscal and concessional incentives, and conservativeness in the legal framework towards the PSX. Consequently, the accessibility of foreign investors was very limited in the stock market of Pakistan. Financial regulations, rigid regulatory policies, along with government control deterred the efficient and competitive behavior of the stock market of Pakistan. Pakistan was in dire need of an efficient capital market for productive investment and resource mobilization. The principal objective of deregulation/reforms and institutional developments was to attract international/foreign investors, encourage domestic investment and remove the barriers in the way of efficient resource allocation and economic growth.

Since 2009, the PSX experienced a series of regulatory policy changes/reforms and institutional developments. Among those major institutional developments were the successful corporatization and demutualization of stock exchanges in 2012, during the

first reform period, to reduce segmentation, and the integration of stock exchanges (KSE, LSE, and ISE) into a unified stock market, namely the Pakistan Stock Exchange Limited (PSX) during 2016, in the second reform period under the Stock Exchanges (Corporatization, Demutualization, and Integration) Act (2012) to reduce fragmentation. Moreover, various financial reforms and developments were made institutionally by the State Bank of Pakistan (SBP) and the Security and Exchange Commission of Pakistan (SECP) with a view to facilitate the efficient working of the PSX during reform period-I and reform period-II. These included developments in the Primary Dealer (PD) system, Know-Your-Customer (KYC), and Customer-Due-Diligence (CDD). These also included trading through the Karachi Automated Trading System (KATS) under the T+2 settlement system and online trading through order routing systems. To strengthen the base of institutional capital, paid-up capital was increased. Small enterprises were also facilitated for the development of portfolios.

The primary objective of this study is to explore the impact of these institutional developments and financial reforms on firm-specific return predictability, including SMB (size premium) and HML (value premium), where emphasis is on the comparison of volatile behavior of security returns during the sub-periods of financial reforms and institutional developments (Reform Period I: January 2009 to December 2013, and Reform Period-II: January 2014 to December 2018), with the non-reform sub-period when no developments were made institutionally, and the stock market was highly regulated and segmented (non-reform period: January 2004 to June 2008)[3]. Furthermore, the reform period is divided into two sub-periods (Reform Period I and Reform Period-II), to differentiate the impact of frequent and aggressive policy measures/reforms and major institutional developments found in the later (second) period of reforms. The basic motive of the research paper is to find asset pricing anomalies and return volatility after institutional development. The associated hypothesis for firm-specific return predictability is that if a number of firm characteristics (size and value premiums) are related to excess returns, then the magnitude of the risk premia is higher during the reform period than non-reform period. It is also hypothesized that institutional development and financial reforms have contributed to higher risk premiums and stock volatility in Pakistan.

This paper focuses on stock return predictability using a large sample of 305 non-financial firms from the period of January 2004 through December 2018. Such a study is important for policymakers and financial market regulators to conduct the cost and

[3] This classification is based on newly implemented rules and regulations and institutional developments made (reform sub-periods), along with the period when no developments were made institutionally and lack of new rules & regulations (non-reform sub-period) to make the PSX more efficient by both the SBP and the SECP during 2004 to 2018.

benefit analysis of different financial reforms and institutional developments towards the mobilization of capital and pricing of risk. This is the first study based on updated daily stock prices of the non-financial sector to predict firm-specific returns and time variation in return volatility. This study significantly contributes to the prediction and understanding of various firm characteristics such as size and value. The empirical findings confirm the established hypothesis that the behavior of stock prices is explained by factors like size, value and market risk in the PSX. Therefore, the time-varying behavior of volatility in expected returns is highly significant and predictable during the reform period. These findings of the established hypothesis are according to theory. In theory, the financial institutions that emerged from the reforms/deregulation and institutional developments are sometimes characterized by large inefficiencies. The deregulation/reforms and developments may increase volatility in stock returns due to these inefficiencies and lead to high risk premiums. The study contains the following sections: Section 2 reviews the literature, while data description and methodology are provided in Section 3. The discussion of results is given in Section 4. Conclusion and proposed policy implications are given in Section 5.

Literature Review

Firm-specific Return Predictability

Empirical work conducted both in developed and emerging markets on firm-specific return predictability has been reviewed in this section. This study sheds light on firm-specific predictors of excess returns, including size (SMB) and book-to-market (B/M). Many researchers (Cakici *et al.*, 2013; Fama & French, 1992; Fama & French, 1993; Fama & French, 1996; Hasan & Javed, 2011; Mirza & Shahid, 2008; Zaremba & Konieczka, 2017) used the Fama and French three-factor model to find the firm-specific return predictability in both developed and emerging markets. Fama and French (1992) predicted that the value premium exhibited a stronger effect than the size effect. When both risk premia were combined, the model gave better results. Cakici *et al.* (2013) predicted a strong value effect in eighteen emerging markets and Zaremba and Konieczka (2017) also found a strong effect of the value premium, but a weak size effect appeared in the Polish stock market. However, other researchers (Banz, 1981; and Claessens *et al*., 1995) found a strong size effect.

The studies of Fama and French (1993, 1996) also predicted the size and value effects in stock returns and found firm-specific return predictability. The studies of Mirza and Shahid (2008), and Hasan and Javed (2011) also found return predictability in the emerging markets of Pakistan.

Impact of Institutional Development on Return Predictability

This section reviews the studies regarding the impact of financial reforms and institutional development on return predictability, both in developed and emerging markets. Institutional development and financial liberalization centered on various trading-oriented matters, which comprised of investor protection in securities regulations, business management for investment firms, facilitating transactions, enhancement of efficiency and seeking financial stability (Napolitano, 2011; Snider, 2011; Trachtman, 2010). For the protection of the consumer, the useful regulatory intervention was discussed by Benjamin (2010) to introduce different standards to overcome market failure and inefficiency. Morck, Yeung, and Yu (2000) highlighted the important role of institutional development while justifying the synchronous movements of stock prices and return predictability in both developed and emerging markets. The synchronicity of stock returns and return predictability appeared higher in emerging markets as compared to developed markets due to less respect for property rights.

Various structural changes, technological and institutional developments along with financial liberalization and return predictability were identified by Kanasro and Chandio (2011) from 1986 to 2010 in the PSX. The study highlighted the positive impact of institutional development on return predictability, as shown by size and other factors after introducing the KATS and Central Depository System (CDS). Abbas and Imtiaz (2017) highlighted the impact of institutional investment on return predictability from 2008 to 2013 and found a significant and stabilizing role of institutional investment/investors on stock return volatility. Khorana, Servaes, and Tufanod (2005) predicted the negative relationship between institutional investors (risk-averse) and stock return volatility, which encouraged institutional investment. The study also highlighted the growing role of institutional investors, both in developed and emerging markets.

Nishat (2000) predicted the impact of financial liberalization and institutional development on stock prices in Pakistan from 1980 to 1994. The study observed that after institutional development, there was a significant increase in the risk premium during the reform period, particularly between July 1991 and December 1994. The volatility in returns and the persistence in volatility were found only during the reform period.

In addition, Nishat (2001) highlighted the impact of institutional development and financial reforms on industry-based stock return predictability and confirmed the hypothesis that the opening up of financial markets contributed to higher risk premia at the industry level in the period of reforms in the PSX. The stronger relation of higher returns to higher risk appeared in the reform period (July 1988 to December 1994) than that of the non-reform (January 1980 to June 1988). The volatility in industry returns was more pronounced in the period of reforms.

Hafeez and Nishat (2019) predicted the significant impact of regulatory developments on risk premia from 2004 to 2016 and confirmed the presence of market, size and value premiums along with volatility in the average returns in the PSX. Moreover, Hafeez (2019) investigated the significant impact of institutional development on the stock return predictability of the non-financial sector in the PSX, using data from 2003 to 2016. It was observed that higher stock returns were found in the second reform period after aggressive and frequent policy changes during the period 2013 to 2016. Therefore, stock returns were more predictable during the reform period than that of the non-reform.

Data Description and Methodology

Data Source

Data on the daily KSE 100 index on firm-level daily share prices are extracted from January 2004 to December 2018, having the same number of companies for the entire study period, from "DataStream" and "Data Portal" of the PSX. The data consists of the daily updated firm-level share prices of the non-financial sector, consisting of a large sample of 305 daily stocks over 15 years. The 6-month Treasury bond is used for the risk-free rate of return, which is published in the Banking Statistics of the SBP. Accounting data (number of outstanding shares, shareholder's equity, paid-up capital and face value of share) has been accumulated from different bulletins of the SBP, named the "Balance Sheet Analysis" and various "Analysis Reports" of the PSX. The adjusted close prices have been used to calculate daily returns.

Sample Selection and Criteria Limitation

The selected sample consists of the companies listed on the PSX. The sample is finalized on the basis of the following criteria:

- for the selected firms, daily share prices, book and market values of stocks along with market capitalization should be available;
- the sample consists of stocks from only non-financial firms as used by Fama and French (1992, 2015);
- the selected companies should last over a period of 15 years (2004-2018);
- to obviate thin trading, the sample consists of the stocks which have reasonable liquidity and have at least 90% to 95% of the trading span of the overall period of this study.

Equally Weighted Portfolios

Equally weighted portfolios enhance the performance of the FF3-F model, as compared to the value-weighted portfolios, formulated by different researchers including Lakonishok *et al*. (1994), Fama and French (1996), and Plyakha *et al*. (2012). Thus, the present study computes equally weighted portfolios.

Portfolio Formation

The methodology of portfolio formation has been adopted as proposed by Fama and French (1992, 1993) to capture the effect of size and value premiums, along with the market premium. The method of the formation of a portfolio is as follows:

- To calculate SMB, known as size premium, the portfolios are sorted on the basis of size (i.e. market capitalization). The market capitalization of each security is computed at the end of December of year t_{-1}, then followed by the stocks, which are sorted in ascending order. The sample is then divided into two portfolios on the basis of the calculated median. The first portfolio is called "Small", which comprises of stocks that consist of a market capitalization less than the estimated median. The second portfolio is called "Big", which is comprised of stocks containing a market capitalization (size) of more than the estimated median.
- For the calculation of value premium (i.e. HML), size sorted portfolios are further sub-divided into three portfolios. This division is based on the average yearly BMV (Book-to-Market Value), where the book value of each share is divided by its market value. Firms are sorted in the descending order of their BMV. Then, the "Small" firms' portfolios are further divided into three portfolios, categorized as Small/High (S/H), Small/Medium (S/M) and Small/Low (S/L) on the basis of BMV. Likewise, the "Big" firms' portfolios are also sub-divided into three portfolios such as Big/High (B/H), Big/Medium (B/M) and Big/Low (B/L) on the basis of BMV.

Variable Construction

The factor premiums are constructed as follows:

- Market premium is calculated as return on the KSE 100 index minus the return on the risk-free asset. It is computed in the following way:

$$RP_t = R_{Mt} - R_{Ft}$$

- Size premium is calculated by subtracting the average return of the three portfolios of the big market capitalization from the expected returns of the equally weighted three portfolios of small market capitalization. Mathematically, size premium can be expressed as:

$$SMB = 1/3 \times [(S/H - B/H) + (S/M - B/M) + (S/L - B/L)]$$

- Value premium (HML) is calculated by subtracting the mean return on two portfolios having low BMV, from the returns on (two) portfolios of big BMV. It is estimated as follows:

$$HML = 1/2 \times [(S/H - S/L) + (B/H - B/L)]$$

Models and Empirical Methods

The financial theory believes in the proportional trade-off between the return of a stock and its risk, which needs an equilibrium model for a risk-return trade-off. Since the nativity of the EMH, the only equilibrium model was the Capital Asset Pricing Model (CAPM) as shown in equation (1):

$$E(R_i) = R_F + \beta_i * [E(R_M) - R_F] + \varepsilon_i \quad (1)$$

Where β_i shows the stock's sensitivity to the (market) risk and ε_i represents the residual return. Fama and French (1992, 1996) indicate that their multifactor and three-factor models are based on the CAPM. The model in equation (2) shows the security's excess return [i.e. $E(R_i) - R_F$], which is determined by the responsiveness of the return to risk factors/premiums. The average excess return on portfolio *i* is specified as,

$$E(R_i) - R_F = b_i * [E(R_M) - R_F] + s_i * E(SMB) + h_i * E(HML) \quad (2)$$

Where expected risk premiums are represented by $[E(R_m) - R_F]$, $E(SMB)$ *and* $E(HML)$ and factor sensitivities or loadings are exhibited by b_i, s_i, h_i.

$$R_{it} - R_{Ft} = \alpha_i + b_i * (R_{Mt}) - R_{Ft} + s_i * (SMB_t) + h_i * (HML_t) + \varepsilon_{it} \quad (3)$$

Where α_i is the intercept of the equation representing the non-market return and ε_{it} is the random return. The augmented FF3-F model includes the time-varying component in betas i.e. R_{Mt}/σ^2_{Mt}. The significant impact of the size and value premiums may disappear or reduce as the time-varying component is adjusted in the systematic risk. The augmented model containing time-varying component is written as:

$$R_{it} - R_{Ft} = \alpha_i + b_i * (R_{Mt}) - R_{Ft} + s_i * (SMB_t) + h_i * (HML_t) + \delta_i * (R_{Mt}/\sigma^2_{Mt}) + \varepsilon_{it} \quad (4)$$

The study of Schwert and Seguin (1990), known as the SS model (market model) is derived in the following way:

$$R_{it} = \alpha_i + \beta_{it} R_{Mt} + e_{it} \quad (5)$$

The SS model uses a heteroscedastic model of the market, depicting that variation in betas is directly related to market volatility as follows:

$$\beta_{it} = \beta_i + (\delta_i / \sigma^2_{Mt}) \quad (6)$$

Where δ_i/σ^2_{Mt} represents the time-variant and the constant factor is shown by β_i. Replacement of Equation (6) into Equation (7) gives the SS model as shown below:

$$R_{it} = \alpha_i + \beta_i R_{Mt} + \delta_i (R_{Mt}/\sigma^2_{Mt}) + \varepsilon_{it} \quad (7)$$

Where R_{it} is the security return, R_{Mt} represents the market return, σ^2_{Mt} is the conditional variance/volatility, ε_{it} is the stochastic term and α, β and δ indicate coefficients of regression. σ^2_{Mt} is the conditional market volatility and can also be calculated through the GARCH (1,1) model. The Chow test has been employed to find

the significant impact of institutional development and policy/structural changes between reform and non-reform periods. The test has been applied after satisfying both assumptions, including error terms $\boldsymbol{u}_{1t}$ and $\boldsymbol{u}_{2t}$ in the regressions of sub-periods, which are independently and identically distributed (IID). Moreover, the dummy variable is also introduced in equation (4) to find the impact of reforms and institutional development on return predictability as shown below:

$$R_{it} - R_{Ft} = \alpha_i + b_i*(R_{Mt}) - R_{Ft} + s_i*(SMB_t) + h_i*(HML_t) + \delta_i*(R_{Mt}/\sigma^2_{Mt}) + d*(INS) + \varepsilon_{it} \quad (8)$$

Where D =1 for the period of institutional development, and D = 0 for otherwise.

Discussion of the Results

This section empirically shows the results of the examined hypothesis to see the impact of institutional development and financial liberalization/reforms on return predictability and variation in returns before and after the reforms. The regression results shown in Table 1 are estimated through the FF-3F model to find out the risk premia. Table 1 indicates the regression results; there exist size (SMB) and value (HML) premia along with the market (risk) premium for the sample period. The signs of the variables are according to theory for most of the portfolios in particular during the reform periods. The explanatory power for the six portfolios ranges from 22% to 73% for the overall study period.

During the reform period-I, size effect dominates the value effect in predicting stock returns, exhibiting that size effect is positive and significant for five out of six portfolios. It implies that size effect adds to explain return predictability more than the value effect and also indicates that small-capitalization stocks outperform the big capitalization stocks as the SBP facilitates small enterprises through various financial reforms during the reform period-I. This is similar to Banz (1981). However, during the reform period-II, the value premium is dominant in comparison with market and size premia. It exhibits that market equity and risk-factor beta do not add to predict stock returns. Moreover, the value premium is positive and significant for four out of the six portfolios indicating that value stocks outperform the growth stocks and value effect has a stronger role in predicting returns as compared to the size effect. As the SECP introduces various reforms to increase paid-up capital and shareholder's equity to strengthen the institutional capital base, it directly affects the (BM) value of the firm. It also suggests that stock risk is multidimensional (size is one and value is another dimension). The results of the study are in line with that of Fama and French (1992), with respect to the dominance of the value effect over the size effect. In short, the correct signs and significant t-values of SMB and HML, in most of the cases, represent the existence of return predictability in the PSX after institutional development and financial reforms.

The increased risk premia in form size and value effects during both reform periods (reform period-I & reform period-II) indicate higher compensation (higher average returns), which is required for bearing higher risk after financial liberalization and institutional development.

Market premium is also present and high in both reform sub-periods as compared to non-reform periods. The results indicate the presence and significance of size, value and market premiums and also exhibit that the risk premia are higher during the reform period than the non-reform period. These findings confirm the established hypothesis that institutional development and financial reforms lead to higher risk premia in the reform periods, in particular, in the second sub-period of reform in Pakistan. Therefore, the institutional development and reforms could not stabilize the stock price movements in the PSX. This finding appears similar to Nishat (2000) and Hafeez's (2019). Moreover, the findings of Chow test (F-statistics) exhibit the significant impact of institutional development and regulatory policy changes on risk premiums in the case of Pakistan.

The regression results shown in Table 2 are estimated through the augmented FF3-F model to find the return volatility. As expected, few coefficients which capture the effects of market, SMB and the HML premiums appeared significant. These effects largely disappear. The augmented FF-3F model is thus detecting the volatility in market return, which is not captured by the FF-3F model, and the explanatory power represented by R^2 of the estimated model of different portfolios ranges from 12% to 89%. The findings from Table 2 of the present study indicate that the δ coefficient indicating time varying risk premium is significant for almost all the portfolios for all the periods undertaken. This provides information about the time variation in systematic risk (beta), which is priced. As expected, all the values appear with the negative sign except a few which are not statistically significant. However, it is expected to be theoretically positive for the big-size (market-capitalization) portfolios and appeared negative for the small-size (market-capitalization) portfolios. It is important to mention the study of Grieb and Reyes (2001) in this context, which finds that thirty-two out of the total 38 stocks listed on the Brazilian Stock Exchange, an emerging market like the PSX with respect to size, have negative δ's. The conclusion can be drawn that the PSX performs as a small-size (capitalization) market, and leads to a higher average return like the Brazilian Stock Exchange. This finding is also in line with that of Banz (1981).

The results of the augmented FF-3F model, therefore, coincide with the findings of Grieb and Reyes (2001) to a large extent. Thus, the PSX can be regarded as a small-capitalization market because most of the δs are negative. The explanatory power of the different pricing models used in this study is shown in Table 3. The market model, CAPM, shows weak validity with reference to the Pakistan stock market, as compared to

the FF3-F model, which is generally acceptable. It is also evident that the augmented FF-3F model substantially explains the portfolio returns, and its explanatory power reaches up to 89%. The results of the dummy variable highlight that the institutional development and financial reforms have a significant impact on stock return predictability in the PSX.

Table 3: *Comparative Statement of* R^2

	Portfolios	**CAPM**	**FF-3FM**	**AFF-3FM***
Overall (2004-2018)	*S/H*	.005	.470	.505
	S/M	.018	.224	.309
	S/L	.033	.512	.577
	B/H	.103	.733	.804
	B/M	.008	.249	.390
	B/L	.091	.218	.319
Non-Reform Period	*S/H*	.079	.605	.791
	S/M	.048	.153	.175
	S/L	.025	.495	.579
	B/H	.069	.213	.285
	B/M	.007	.236	.360
	B/L	.028	.273	.292
Reform Period-I	*S/H*	.049	.241	.319
	S/M	.004	.105	.120
	S/L	.029	.139	.653
	B/H	.107	.230	.444
	B/M	.167	.263	.666
	B/L	.055	.275	.869
Reform Period-II	*S/H*	.047	.243	.265
	S/M	.066	.088	.178
	S/L	.005	.110	.890
	B/H	.019	.388	.710
	B/M	.140	.167	.340
	B/L	.172	.483	.409

**FF-Three Factor Model has been augmented to capture time-variation in Beta.*

Table 1: *Fama and French Three-Factor Model-Regression Results for Size and Book-to-Market Sorted Portfolios*

Periods		***α***	***b***	***s***	***h***	***t (α)***	***t (b)***	***t (s)***	***t (h)***	R^2	**F-stat****
Overall (2004-2018)	*S/H*	.019	.755	2.24	2.45	.477	5.74*	5.00*	13.6*	.470	18.5*
	S/M	.038	.577	3.29	1.33	1.57	2.80**	4.67*	5.97*	.224	7.22*
	S/L	.040	.931	-.135	3.48	1.28	9.14*	-1.91	9.07*	.512	10.5*
	B/H	.016	.842	-.371	-.127	3.61*	8.90*	-8.86*	-3.40*	.733	5.02*
	B/M	.025	.638	.253	.226	1.19	2.14**	3.47*	3.93*	.249	4.02*
	B/L	.048	.138	-.182	-.216	2.44**	2.70**	-2.49**	-4.00*	.220	8.15*
Non-Reform Period	*S/H*	-.092	.672	-.603	-.398	-.479	2.82**	-13.4*	-12.5*	.605	-
	S/M	-.046	.697	.302	.132	-.989	1.28	3.53*	1.87***	.153	-
	S/L	-.084	.662	-.635	.192	-1.34	1.95	-8.64*	3.63*	.495	-
	B/H	-.078	.755	.076	.293	-1.75	1.82	.698	4.30*	.213	-
	B/M	-.019	.618	-.019	.227	-0.30	4.22*	-.144	4.02*	.236	-
	B/L	.028	.595	.151	.130	.861	1.40	1.97**	2.07**	.273	-
Reform Period-I	*S/H*	.014	.654	.299	.374	.367	.790	2.56**	3.93*	.241	-
	S/M	-.039	.493	.197	.025	-.853	1.19	3.47*	.475	.105	-
	S/L	.023	.679	2.31	.121	.474	5.58*	9.96*	4.74*	.139	-
	B/H	-.052	.499	1.39	-.009	-1.47	3.99*	10.9*	-.303	.230	-
	B/M	.005	.995	.150	.194	1.50	9.81*	3.77*	5.50*	.263	-
	B/L	.022	.914	-.232	-.070	1.27	6.30*	-7.68*	-3.77*	.275	-
Reform Period-II	*S/H*	-.007	.685	.141	.063	-0.80	3.67*	2.93*	2.68**	.243	-
	S/M	.045	.258	-.159	1.22	.020	6.60*	-2.52**	4.44*	.088	-
	S/L	.056	1.06	-.181	.145	2.02**	5.40*	-5.63*	5.77*	.110	-
	B/H	-.023	.747	.187	2.06	-.790	6.98*	2.82**	1.19	.388	-
	B/M	-.002	1.25	-.083	1.02	-.054	3.92*	-1.53	.376	.167	-
	B/L	.050	.816	.077	2.24	3.30**	2.93**	1.29	5.86*	.483	-

** Significant at 1% level;** significant at 5% level; ***significant at 10% level.*

***F-stat represents Chow test indicating a significant change in risk premia between reform and non-reform periods.*

Table 2: *An Augmented Fama and French Three-Factor Model: Regression Results*

Periods		***α***	***b***	***s***	***h***	**δ**	***d***	***t (α)***	***t (b)***	***t (s)***	***t (h)***	***t (δ)***	***t (d)***	R^2
Overall	S/H	.058	.620	.280	.115	-.087	.302	1.33	1.51	.076	4.05*	-3.40*	5.74*	.505
(2004-18)	S/M	.878	.390	.391	.044	-.018	.055	2.92*	1.28	.066	.011	-7.46*	.785	.309
	S/L	.146	.942	.125	.171	-.017	.096	1.09	1.45	.075	1.22	-5.86*	2.44**	.577
	B/H	.096	.965	.173	-.072	-.036	.520	1.57	1.23	1.41	-.071	-2.07**	7.74*	.804
	B/M	1.61	.441	.152	.060	-.032	.137	1.06	1.52	.003	.063	-5.06*	1.73***	.390
	B/L	.006	.328	-.232	-.189	.065	.278	.319	1.49	-1.02	-.066	1.37	3.75*	.319
Non-Reform	S/H	.086	1.15	-.195	-.148	-.004	.005	1.39	.035	-1.20	-.307	-2.35**	.085	.791
Period	S/M	.087	.502	.200	.048	-.067	.056	1.36	1.03	3.62*	.889	-0.62	.749	.175
	S/L	.089	1.04	-.072	-.006	-.072	.298	3.93*	1.37	-1.19	-.134	-6.06*	1.60	.579
	B/H	.108	.607	.033	.273	-.089	.113	.094	3.94*	.534	5.75*	-2.74**	1.25	.285
	B/M	.673	.568	.079	-.033	-.026	.123	1.19	1.46	1.45	-.786	-.644	2.21**	.360
	B/L	.096	.560	.088	.059	-.014	.002	1.12	1.20	.180	1.52	-.278	.078	.292
Reform	S/H	.126	.467	.165	-.040	-.085	.130	.760	.010	.056	-.772	-3.88*	1.55	.319
Period-I	S/M	.705	.367	.069	-.010	-.003	.151	.675	.047	1.13	-.282	-6.22*	2.08**	.120
	S/L	.011	.768	.077	.150	-.201	.032	1.18	.072	9.32*	6.93*	-8.92*	6.68*	.653
	B/H	.005	.601	.657	-.156	-.032	.224	1.33	7.47*	9.03*	-1.18	-2.82**	3.79**	.444
	B/M	.004	1.09	.280	.097	-.004	.009	.120	.070	.414	3.15*	-1.84***	.144	.666
	B/L	-.055	1.01	.199	2.08	-1.39	.066	-.265	6.90*	1.16	4.77*	-5.65*	.561	.869
Reform	S/H	.102	1.07	2.88	.084	-.072	.145	.677	4.83*	6.58*	2.21**	-1.92***	2.87**	.265
Period-II	S/M	.003	.166	1.99	-.881	.087	.260	.043	.094	8.58*	-1.05	1.25	3.07*	.178
	S/L	.006	1.06	2.22	-.037	.004	.447	1.30	4.97*	7.36*	-1.27	.357	12.1*	.890
	B/H	.021	1.01	.214	-.080	-.093	.078	3.06*	4.14*	.097	-.825	-4.02*	4.95*	.710
	B/M	.010	1.11	2.07	-.056	-.203	.407	2.53**	3.77*	2.61*	-1.42	-5.45*	3.86*	.340
	B/L	.029	.993	1.95	2.06	-.083	.231	2.76**	7.55*	3.07*	1.51	-2.03**	2.83**	.409

**Significant at 1% level; ** significant at 5% level; ***significant at 10% level.*

Conclusion and Policy Implications

This study investigates the firm-specific return predictability from 2004 to 2018 in the PSX, an emerging market of Pakistan. Different asset pricing models have been employed in predicting asset returns in the PSX under the impact of institutional development. The FF3-F is investigated to find out the joint effect of market, size and value premiums and the augmented FF3-F model is employed to capture return volatility. The observation shows that portfolio managers and investors can use the size and value premia as investment strategies. Furthermore, returns on the PSX can be better explained by the augmented FF3-F model which also reveals that the time-variation in risk factor (beta) is priced. The time-varying component in betas is changing over time, which leads the researchers, portfolio managers, and security analysts to consider the time-varying risk factor in their analysis. It is, therefore, important while examining long holding periods.

This study also provides important insights to investors, financial market regulators, and financial analysts. The prediction regarding return and volatility would enable investors to make rational decisions while buying and selling securities in the PSX. It is also found that the augmented FF3-F model performs better in predicting return and volatility for investment strategies. One of the important and main findings of the present study is that the volatility in returns increased significantly during the second reform period. This is similar to that of Nishat (2000) and Hafeez (2019). Thus, it is recommended that the augmented FF3-F model could be used to predict return volatility in the PSX. Moreover, the Chow test and the coefficient of the dummy variable indicate a significant impact of institutional development on return predictability and the findings are consistent with the behavior of emerging markets. Further research is required to be conducted on return predictability by comparing the stocks of both financial and non-financial sectors under the umbrella of institutional development. Further research is also required by taking into account other dimensions of risk.

References

Abbas, M. & Imtiaz, B. (2017). Institutional investment and stock returns volatility at Pakistan stock exchange (PSX). *FWU Journal of Social Sciences*, *11*(1), 219-229.

Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics, 9*(1), 3–18.

Bekaert, G., & Harvey. (1997). Emerging equity market volatility. *Journal of Financial Economics*, *43*(1), 29-77.

Benjamin, J. (2010). The narratives of financial law. *Oxford Journal of Legal Studies, 30*(4), 787-814.

Cakici, N., Fabozzi, F. J., & Tan, S. (2013). Size, value and momentum in emerging market stock returns. *Emerging Markets Review*, *16*, 46–65.

Claessens, S., Dasgupta, S., & Glen, J. (1995). Return behaviour in emerging stock markets. *The World Bank Economic Review*, *9*(1), 131-151.

De Santis, G., & Imrohoroglu, S. (1997). Stock returns and volatility in emerging financial markets. *Journal of International Money and Finance*, *16*(4), 561-579.

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *The Journal of Financial Economics*, *116* (1), 1–22.

Fama, E.F. (1970). Efficient capital markets: a review of theory and empirical work. The *Journal of Finance*, *25*(2), 383–417.

Fama, E.F., & French, K.R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47*(2), 427-465.

Fama, E.F., & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. The *Journal of Financial Economics*, *33*(1), 3–56.

Fama, E.F., & French, K.R. (1996). Multifactor explanation of asset pricing anomalies. *The Journal of Finance*, *51*(1), 55-84.

Grieb, T., & Reyes, M.G. (2001). Time-varying betas in an emerging stock market: the case of Brazil. *American Business Review*, *19*(1), 118-124.

Hafeez, A. (2019). Institutional development and stochastic behavior of common stock prices in Pakistan. *Ph.D. dissertation*, Applied Economics Research Centre, University of Karachi, Pakistan.

Hafeez, A., & Nishat, M. (2019). The impact of regulatory developments on size and value premiums: the case of the Pakistan stock exchange. Paper presented at *National Conference on Business Research*, Bahawalpur-Pakistan.

Hassan, A., & Javed, M. T. (2011). Size and value premium in Pakistani equity market. *African Journal of Business Management*, *5*(16), 6747-6755.

Kanasro, H. A., & Chandio, J. A. (2011). Structural changes and institutional developments and their impact on capital market: a case study of Karachi stock exchange. *Australian Journal of Basic and Applied Sciences*, *5*(11), 480-485.

Khorana, A., Servaes, H., & Tufanod, P. (2005). Explaining the size of the mutual fund industry around the world. *Journal of Financial Economics*, *78*, 145–185.

Lagoarde-Segot, T., & Lucey, B.M. (2008). Efficiency in emerging markets-evidence from the MENA region. *Journal of International Financial Markets, Institutions and Money*, *18*(1), 94-105.

Lakonishok, J., Shleifer, A., & Vinshy, W. R. (1994). Contrarian investment, extrapolation, and risk. *The Journal of Finance*, *49*(5), 1541-1578.

Mirza, N., & Shahid, S. (2008). Size and value premium in Karachi stock exchange. *The Lahore Journal of Economics*, *13*(2), 1-26.

Morck, R., Yeung, B. & Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements?. *Journal of Financial Economics*, *58*(1), 215-260.

Napolitano, G. (2011). The two ways of global governance after the financial crisis: multilateralism versus cooperation among governments. *International Journal of Constitutional Law*, *9*(2), 310–339.

Nishat, M. (2000). Institutional development and risk premia in Pakistan. Paper presented at *Asia-Pacific Finance Association Conference*, Shanghai, China.

Nishat, M. (2001). Industry risk premia in Pakistan. *The Pakistan Development Review, 40*(4), 929–949.

Plyakha, Y., Uppal, R., & Vilkov, G. (2012). Why does an equal-weighted portfolio outperform value- and price-weighted portfolios?. *Working Paper*, 1787045.

Poon, H., & Granger, C. (2003). Forecasting volatility in financial market: a review. *Journal of Economic Literature, 41*(2), 478-539.

Schwert, G.W., & Seguin, P.J. (1990). Heteroscedasticity in stock returns. *The Journal of Finance*, *45*(4), 1129-1155.

Snider, L. (2011). The conundrum of financial regulation: origins, controversies, and prospects. *Annual Review of Law and Social Science*, 7, 121-137.

Trachtman, J. P. (2010). The international law of financial crisis: spillovers, subsidiarity, fragmentation and cooperation. *Journal of International Economic Law, 13*(3), 719-742.

Zaremba, A., & Konieczka, P. (2017). Size, Value, and momentum in polish equity returns: local or international factors?. *International Journal of Management and Economics*, *53*(3), 26-47.