

Relationship Between Multi-Factor Pricing And Equity Price Fragility: Evidence From Pakistan

Muhammad Mohsin, Uzma Zaidi, Qaiser Abbas, Hassan Mahfooz Rao Nadeem Iqbal, Imran Sharif Chaudhry

Abstract : Background: The study is investigating conventional and behavioral pricing multifactor impact on price fragility from the equity market of Pakistan. The impact of conventional factors is significant on price fragility. The recent research has not covered the desired scope of such relationship due to several issues such as sample size, lack of database resources and systematic reviews. Moreover, the available literature of price fragility is very limited. In Pakistan Stock Exchange (PSX), there is an immense need to develop corporate culture to promote standard modern financial practice to enhance financial productivity and sustainability. The current research having theoretical framework is valuable and is providing information about pricing multifactor impact on price fragility in reference to Pakistan. Method: The positivist approach is used as a research paradigm. In this correlational study, the probability sampling was used. While, systematic sampling was used for data collection of PSX, the sample was tested parallel to the mean-variance random walk theory. Results: It was found that the factors of value, size, Illiquidity and Price earning premium are significantly ($P < 0.01$) affecting the price fragility. Findings and Conclusions: Specifically, the herd behavior and disposition effects are found to be insignificant. However, the size, value, liquidity and the price earning resulted in a significant impact on the price fragility in short run. For the corporate culture, sound corporate governance boards should be established, family governance system should be replaced by an independent democratic board. Mispricing and arbitrage require serious control. The study is discussing implications in the light of results for the prosperity of PSX.

Key Words: Equity Price, Price Fragility, Conventional, Herd behavior, Systematic Sampling, PSX, disposition effects

1. INTRODUCTION

For the purpose of buying and selling common stock share, certain amount of money is required. The equity pricing tends to change throughout the trading day, especially during the times of the high trading volume. Equity pricing is a multifaceted factor that can determine the risk of price fragility within any of the stock market. The equity funds and their costs are based on the worth mechanism that is considered as extraordinarily valued and they continue to be rising in Asian countries because of the variant response of investors towards securities market (Bear & Curley, 2006). Extending to that, the participation of the Chinese economy in the Pakistani securities market is additionally getting the benefit from its dynamic role in equity worth mechanism that might speed up in the near future (Hau, 2011). China–Pakistan Economic Corridor (CPEC) is penetrating a sensory activity growth sentiment to the Pakistani economy via Chinese economic participation (Riaz & Mi, 2017). In addition to this, China has shown its participation in the PSX, particularly in exchange-listed equities. Thus, equity worth structure can be a protein for PSX. Lately, in Pakistan, third democratic transition part is functioning and building an institutionally

sustainable sentiment that is backing perceived sentiment of growth in the Pakistani economy. One of the famously proposed assumptions by Greenwood and Thesmar (2011), explained that, “arbitrageurs are willing to trade sharply against the liquidity shocks of different investors, therefore, making it certain that demand curves for individual money assets are flat”.. Although, liquidity plays an essential role within the stock exchange and an enormous empirical literature in finance tends to deal with and propose various assumptions. This fact cannot be overlooked that measuring liquidity is still tricky (Vidović, Poklepović, Aljinović, 2014). Due to the diverse nature of the context, a signal measure of liquidity is not possible. In this research, the study approach of price fragility by Greenwood and Thesmar will be followed. Evidence of asset prices is found aggressively arbitrated by investors with market capitalization, value premium and market momentum in a homogeneous manner in developed economies (Fama & French, 2012). In the eastern Europe, the stock price is clearly explaining Illiquidity, value, size, and market premium with insufficient momentum (Vidović, Poklepović, Aljinović, 2014). Therefore, previous researches proposed various methods for determination of asset price by value, size, market and Illiquidity premium resulting significant contribution with contextual heterogeneity and for long term benefits (Elton, et al., 2011). Concurrently, similar results were found in various countries (Abrate & Viglia, 2016). Hence, this contextual heterogeneity is significant reason to conduct current study in Pakistan. For the economy, integration of equity markets and potency is exceptionally vital. In the economic market, investors invest arbitrarily by capturing entire statistics returns wherever persistent information forecasts expected capital gains and liquidation (Gerstner & Hess, 2002). This projected financial gain is cointegrated with variations in quality costs (Lauridsen, Nannerup, & Skak, 2008) grounded by capitalist reaction with multiple models of rating. The assets rating models capture the truthful worth of equity funds in the market (Kim, Rahman & Shamsuddin, 2018; Raza, Abdullakutty, & Rathinam, 2016). These are the best models found preliminary for assets rating that is joined with quality growth and gain individually in long and short run. This is

- Muhammad Mohsin, PhD, School of Finance and Economics, Jiangsu University, Zhenjiang, China. E-mail: m.mohsin3801@yahoo.com (Principal Author)
- Uzma Zaidi, PhD, Associate Professor, Program Director Clinical Psychology, College of Health and Rehabilitation Sciences, Department of Health Sciences, Princess Nourah bint Abdulrahman University, Saudi Arabia. E-mail: uazaidi@pnu.edu.sa (Corresponding Author)
- Qaiser Abbas, PhD, Department of Economics, Ghazi University, Dera Ghazi Khan, Pakistan. Email: qabbas@qudghk.edu.pk
- Hassan Mahfooz Rao, DBA, Sheffield Business School at Sheffield Hallam University Sheffield, United Kingdom. E-mail: lettland@gmail.com
- Nadeem Iqbal, PhD, Department of Business Administration, Ghazi University Dera Ghazi Khan, Pakistan. Email: drnadeemiqbal1@gmail.com
- Imran Sharif Chaudhry, PhD, School of Economics, Bahauddin Zakariya University, Multan, Pakistan. Email: Imran@bzu.edu.pk

less explained contextually and is supported by arbitrage rating theory which explains the arbitrage issue and diversification of portfolio (Vogiazas & Alexiou, 2017). The Pakistani stock market is less efficient, inconsistent, and mean variant in its operations due to multiple behavioral instincts of investors, arbitrageurs, and short sellers (Tina, 2011). Most of the studies have revealed investors behavior as herding and disposing of during investment and speculative decisions. Herding behavior is a psychological attitude among equity asset holders following similar investing or speculating patterns in equity funds within a same set of market, portfolio or group and it prevails in Asian context (Leathers, 2016). Thus, it revealed the presence of herding behavior and sound efficiency in Asian stock markets. This behavior is observed conditionally variant in Karachi Stock Exchange (KSE) during the short run by creating pride and regret behavior named as disposition effect (Chartered Institute of Management Accountants, 2013). These behaviors construct investor's sentiment having a significant association with market volatility downside risk and performance of asset pricing (Markets, 2012). Therefore, market behaviors are found changing into non-fundamental way resulting price structure as fragile, less rewarding, excessive liquidation of assets reducing long-run investment and capital gain preferences due to equity price fragility (Accounting & Nengzih, 2016) causing non-speculative price bubbles leading equity market to crash (Vogiazas & Alexiou, 2017); Accountant, Financial, & Bruce, 2004). PSX has less uniformity in the equity price structure of stock markets due to contextual variations and higher volatility. Due to the growth factors, social and political sustainability, the participation of the Chinese economy is emerging in the price structure of equity funds in Pakistan. Moreover, truly, the perception of these factors is found positive in Pakistan, theoretically. However, in PSX, since few decades, random walk is highly observed in market trading - based on various behavioral anomalies deviating trading mechanism of PSX from fundamentals to the non-fundamental side that draws deep thinness in equity prices named as price fragility. These sentiments have high arbitrage influence on market trading; affecting equity prices negatively for three reasons, (i) external shareholders being well-informed individuals holding majority of shares and participating less actively in PSX but having majority of share proportionate and losing their corporate earnings and multiple scores in comparison to International business concerns. (ii) Most of the listed companies in Pakistan are family limited companies having unsound corporate board with unspecified long-term objectives. (iii) In result, general/minority shareholders speculating their trading on daily market price to have return, has become short term by responding less seriously with corporate annual dividends and reinvestment plans that maximize their capital gain (Emery, Finnerty, & Stowe, 2007). For the purpose of tackling these sound reasons that are heterogeneous with pricing mechanism to response ideally. Hence, the current study aims to resolve these reasons and their consequences on prices of equities in PSX under random walk behavior. The objectives of the research are, to measure the traditional pricing proponents of equity funds; to identify multifactor pricing models consisting of conventional and behavioral antecedents, and to investigate the contribution/association of multifactor

pricing models in equity price fragility. On the basis of study scope, we have segmented equity pricing theories into two categories

i.e. Neo-Classical pricing theories and behavioral theories. Such segmentation is planned to cover both conventional and behavioral dimensions of equity prices. For the recent investigation, from Neoclassical theories to cover the conventional aspects of pricing factors theoretically, general equilibrium theory, mean-variance theory and arbitrage theory is supporting to address the issue of random walk in the pricing of equity funds (Nuryanah & Islam, 2015). Moreover, to support behavioral aspects of this research, behavioral theories are included in the study. As far as the general theory of equilibrium is concerned, it elaborates as equities are priced up, the nature of procedural risk with the notion of "high return Vs high risk". This theory is having its scope from single-factor pricing to multifactor pricing. However, Harry Markovitz, extended this interplay of risk in 1952 by Mean-variance theory and stated that there is interplay between risk and returns because market investors are rational but are risk-averse individuals. They trade and are prone to choose to mean return with variance risk of their financial part. Hence, they are followers of mean-variance behavior in trading. Apparently, there is a limitation in mean-variance theory which is that it tends to only deal with the risk assets. Ross has challenged it in the year 1977, by proposing Arbitrage Theory in a way that equities are valued by multifactor instead of one factor and the sensitivity of these factors is highlighted by their beta coefficient. Moreover, the rate of return of the portfolios accurately defines assets prices, and if the prices ramify, then the arbitrageurs recover it out.

Moreover, on the side of behavioral aspects limits to arbitrage theory covers pricing of equity funds that the arbitrage limits that would often be used by rational investors, but the price may work in a limit of protection in non-equilibrium position. This theory further explains that when due to noise traders, a shift in equity prices prevails, prices are prone as misprices where a rational investor is found helpless to eradicate it. A similar condition of arbitrageurs also exists at a time. For the purpose of elaborating such phenomena, scholars turned to the behavioral side and they have revealed that there are particular preferences and attitudes in trading and market prices. In order to address these preference-oriented behaviors, there is a need to study other behavioral aspects, where various sentiments of investors are associated with equity trading activities negating efficiency, mean-variance, and equilibrium of equity tradeoffs. Hence, the idea to merge behavioral aspects of investors with equity or equity price cannot be removed and it has its unique representation with classical finance (Shi, Darrat, Li, & Chung, 2013). This research will suggest the best fit model for Pakistani stock market on the basis of random walk behavior for assets pricing and will also suggest the reasons of the fragility of equity funds prices with the contribution of these pricing factors; in order to ensure that desired policies can be made to overcome random behavior and to boost productive consistency in equity prices of PSX.

2. LITERATURE REVIEW

Stock price fragility was initially introduced by (Greenwood & Thesmar, 2011). It tends to measure the non-fundamental risk. Thus, it aims to segregate and measure

the causal effect of stocks volatility beyond the traditional financial measures, specifically examining the concentrated stock ownership and correlated liquidity shocks on price volatility. These measures would be applied in the Pakistani market (Hameed & Ashraf, 2006). This investigation can be extended to the entire globe because it has more extensive room available geographically which has not been investigated much (Dumas & Sengupta, 1994). Moreover, by extending the investigation of fragility, it would be explored by checking covariance and beta of returns by co-fragility and fragility beta in current investigation (Wang, Wang, & Huang, 2015). Hence, the previous investigations suggested that ownership structure has an impact on these forecasts. Finally, fragility is also suggested to investigate with total return volatility to have an impact of arbitragers on stock prices, and it is found significant in the African context (Petkova, 2006). Such a contextual effect of volatility is another main factor that affects stock returns, including other market motives and sentiments i-e Herd behavior, disposition situation, and news effects. The issue regarding whether the stock returns may be foreseen by the changes in energy costs has been the topic of interest within a literature on the stock come foregone conclusion (refer to, for instance, (Dubé, Gignac, & Racicot, 2008) and (Jiao & Lilti, 2017)). Despite the variety of studies being carried out on this issue, no explicit agreement has been arrived on the presence of an associate economically fruitful association between the stock returns and the energy worth changes (Sharif, Purohit, & Pillai, 2015). We tend to argue that the empirical results stated in past studies may be subjected to the model uncertainty as well as parameter instability. The difficulty of model uncertainty victimization extreme bounds analysis (EBA) will also be addressed in this study. In addition to this, the parameter instability is evaluated by carrying out the rolling subsample analysis. We will provide robust proof for the prognostic talents of energy costs for future U.S.A. stock returns (Campbell, Giglio, & Pathak, 2011). These behaviors and sentiments follow the trends in quantified shape rather than the movement of trades (Gharghori, Chan, & Faff, 2007). To quantify these movements in market prices, there is a need to design market segmentation in trades and trading products (Happ, 1996). This segmentation in products raises firm expectancy of life that enhances book to the market value of the firm and it has a sound relation with price fragility (Jaffee, Stanton, & Wallace, 2018). However, such life expectancy is variant in times and it has several consequences on various equity natures that break the momentum of assets prices (Trimech et al., 2009). Thus, the crash of momentum results inconsistently about working of five factors of assets prices inequity market (Liang, 2018). Moreover, these five factors size, value, momentum, Illiquidity, and market premium are the best explaining variation of portfolios in the international world. Similar findings have resulted in China. Moreover, in North America and Asian countries, five factors are accurately explaining their role in market prices causing fragility but in Japan, momentum is not working significantly due to market inconsistencies (Jaffee et al., 2018). However, these inconsistencies are due to firm-level decomposed sensitivities that float fragility in market prices of equity funds. Moreover, it leads to arbitrage behavior in market prices – another reason for price fragility (Karolyi &

Stulz, 2003) and (von Habsburg, Goodman, Johns, & McAndrew, 2015). The following are research hypotheses,

H1: There is a significant impact of size premium on price fragility

H2: There is a significant impact of value premium on price fragility

H3: There is a significant impact of momentum on price fragility

H4: There is a significant impact of illiquidity on price fragility

H5: There is a significant impact of Price-earnings premium on price fragility

H6: There is a significant impact of market premium on price fragility

H7: There is a significant impact of investor sentiment on price fragility

H7(a): There is a significant role of herding behavior building investor sentiment in PSX.

H7(b): There is a significant role of Disposition affect behavior in building investor sentiment.

3. RESEARCH METHODOLOGY

3.1 Research Design, sample and data collection

Ontological framework of the study is to assess the multifactor of equity pricing and its impact on stock price fragility. The epistemological position is positivism to develop the knowledge having singular reality due to contextual specified reasons of randomly mean-variance and arbitrage behavior in Pakistani stock market. Hence, the rhetoric of the manuscript is formal. The approach of the study is deductive, and the study is aimed to test assets pricing factors and price fragility in PSX on recent data. The study is explanatory about price fragility and multifactor equity pricing; by explaining (i) generalized findings of stock market investors that are complex and multifactor by quantitative method (ii) Trading sentiments less investigated contextually with asset pricing factors and price fragility. For this, the systematic sampling technique is used, and the sample is selected consisting of the companies being listed in PSX for more than or equal to two quarters of the financial year during the sample duration. The population of the study is listed companies at PSX in 100 Index. While, the sample is selected as per criteria defined being heterogeneous as per nature of business comprising healthcare, Oil & Gas Marketing, Oil & Gas Exploration, Cement Sector, Fertilizers, Banking Sector, Telecommunication, and Electrical sector. Therefore, monthly data of listed stocks in PSX are selected from 1/2008 to 12/2017 with the discretion of being continuously listed and having at least two-quarter liquidity to conclude sensitivity in results.

3.2 Construction of Portfolios and Empirical Construction of Variables

A comprehensive model is used to assess multifactor with the fragility of price. The investor sentiment is computed by developing sentiment index comprising of two behavioral proxies as herd behavior and disposition effect (Ho, Kim Hin; Sun, 2014). Thus, seven factors are factorized i-e value premium, Size premium, , momentum, Illiquidity, Price Earning premium, market premium, and Investor sentiment premium (Misund, 2018). Also, to check the

factorial exposure of factors, these are used on t time and to sort them are used on t-1 June of the year (Shen, Pretorius, & Chau, 2018). Hence, these factors are formed named as $\frac{S}{H}, \frac{S}{M}, \frac{S}{L}, \frac{B}{H}, \frac{B}{M}, \frac{B}{L}$.

$$\text{Size Premium} = \text{SP} = \frac{1}{24} X \left[\frac{S}{H} + \frac{S}{M} + \frac{S}{L} + \frac{B}{H} + \frac{B}{M} + \frac{B}{L} \right] \quad (01)$$

$$\text{Value Premium} = \text{VP} = \frac{1}{08} X \left[\frac{S}{H} + \frac{S}{M} + \frac{S}{L} + \frac{B}{H} + \frac{B}{M} + \frac{B}{L} \right] \quad (02)$$

$$\text{Momentum} = \text{MOM} = \frac{1}{12} X \left[\frac{S}{H} + \frac{S}{M} + \frac{S}{L} + \frac{B}{H} + \frac{B}{M} + \frac{B}{L} \right] \quad (03)$$

$$\text{Illiquidity} = \text{ILLQ} = \frac{1}{24} X \left[\frac{S}{H} + \frac{S}{M} + \frac{S}{L} + \frac{B}{H} + \frac{B}{M} + \frac{B}{L} \right] \quad (04)$$

$$\text{Market Premium} = \text{Mkt} = R_m - R_f \quad (05)$$

$$\text{Price Earning Premium} = \text{PEP} = \frac{1}{24} X \left[\frac{S}{H} + \frac{S}{M} + \frac{S}{L} + \frac{B}{H} + \frac{B}{M} + \frac{B}{L} \right] \quad (06)$$

$$\text{Inv-Sentiment} = \text{ISP} = \frac{1}{24} X \left[\frac{S}{H} + \frac{S}{M} + \frac{S}{L} + \frac{B}{H} + \frac{B}{M} + \frac{B}{L} \right] \quad (07)$$

For size premium, equity portfolios were categorized into three subcategories on in comparison to the median value of the portfolio with the market capitalization (Boger, 2001).

$$\frac{S}{L} = \epsilon \int t < \bar{x} \quad (08)$$

$$\frac{S}{M} = \epsilon \int t = \bar{x} \quad (09)$$

$$\frac{S}{H} = \epsilon \int t > \bar{x} \quad (10)$$

These are three categories of portfolios on the base of the size where \int symbol of the portfolio, ϵ represents market capitalization and \bar{x} indicates median of portfolios at t time (Sharma & Prashar, 2013). Portfolio having low market capitalization than the median is ranked as "Small", being equal to ϵ is named as "middle/midpoint" and portfolio having higher capitalization is named as "Large". On book to market ratio, these portfolios are subdivided into three categories (Mariano, Niziel, Sardon, & Ray, 2016),

$$\frac{B}{L} = \int t = 30\%h < \hat{B}M \quad (11)$$

$$\frac{B}{M} = \int t = 40\%h = \hat{B}M \quad (12)$$

$$\frac{B}{H} = \int t = 30\%h > \hat{B}M \quad (13)$$

Afterwards, each portfolio (Chakraborty, Elgammal, & McMillan, 2019) is extended to two further categories by adapting market return R it as fourth pricing factor. Returns of PSX are subdivided into "H" indicating high return and "L" as low market return on historical bases. Moreover, the portfolio is considered as winner having peak return is represented by "U". It made 12 portfolios where S is about the small size, B is for Big, H is for the high book to market ratio, M shows the mid-ratio of book to market and L represents the lower ratio of it. So, the index formation of portfolios of market, size, value, and momentum is following, δ_{it} is capital pricing model of assets, δ_{mt} is the market return, and δ_{ft} is the risk-free return of market at t sample assessment time of the study.

3.3 Econometric Model

Thus, we aim to assess proportionate of momentum, value, market, size and sentiment premium in pricing model of Pakistani stock exchange by assessing the following model,

$$\delta_{it} = \alpha + \varphi_{2it} + \varphi_{3it} + \varphi_{4it} + \varphi_{5it} + \varphi_{6it} + \varphi_{7^*it} + \epsilon_{it} \quad (14)$$

δ is the net result as a difference of risky and risk-free return (C.A.P.M) as a dependent variable, α is constant φ_2 is size premium factor, φ_3 is value premium, φ_4 Illiquidity premium, φ_5 is price earning factor & φ_7 is investor sentiment of I portfolios on t time. We measured φ_{7^*it} (Investor sentiment) by five proxies i-e market returns, divided premium, equity shares, Herding behavior, and the disposition effect.

$$\varphi_{7^*it} = \omega_1 \text{PSXR}_{it} + \omega_2 \text{DIP}_{it} + \omega_3 \text{EQS}_{it} + \omega_4 \text{HB}_{it} + \omega_4 \text{DE}_{it} \quad (15)$$

We measure herd behavior by the model presented by Malvido Perez Carletti, Hanisch, Rommel, & Fulton (2018). We operate with value deviation model to infer with true dispersion in findings. We assess value deviation of portfolios returns γ as high returns Π^U and declining returns Π^D , m is about market returns. Here measure DE^* is another proxy to measure investor sentiment that declares investor feeling regret in loss and declares pride in winning, also known as disposition effect. We use holding periods of the investor having particular equity in portfolios Δt is holding period, θ_t are outstanding shares, V_t market volume daily in Rupee & η_j trading duration of portfolios in days. Behavioral finance argues that value deviation of herd behavior in market factor resulting herd behavior and pride regret behavior; is not only self-drive attitude of the investor or defining investor sentiment it also pinches market prices severely to non-fundamental practice resulting fragility in equity prices (Soprancetti, 2015). Therefore, we adopted price fragility model from Greenwood & Thesmar research presented in 2011 in which, G_{it} is equity fragility in prices, θ_{it}^2 is square of market capitalization, W'_{it} is vector of $(K \times 1)$ ownership of portfolio equities, Ω_t is metrics of equity funds on variance-covariance bases as $(K \times K)$ and K is the number of equities in a portfolio. Moreover, to evaluate the factorial contribution of pricing proponents of equity in price fragility of equity, where G_{it} is dependent, constant as α and we have seven factors of equity price from φ_1 to φ_7 comprising on value, market, size, momentum, illiquidity, price earning and investor sentiment premium with ϵ_{it} error representation (Peterson, 2013).

$$G_{it} = \alpha + \varphi_{1it} + \varphi_{2it} + \varphi_{3it} + \varphi_{4it} + \varphi_{5it} + \varphi_{6it} + \varphi_{7^*it} + \epsilon_{it} \quad (16)$$

3.4 Statistical Analysis

The Descriptive Tests, Correlation Tests, Variance inflation factor Test, Serial Correlation at Lags, Unit Root Tests, ARDL Test, Robustness Test deployed for analysis of study data.

4. RESULTS AND DISCUSSION

Table 1: Descriptive Analysis

	PF	VP	SP	PEP	MP	MOM	ISP	ILLQ
Mean	1.393	0.865	117.3	2.3	139.3	193.3	0.22	943.1
Median	0.004	0.880	113.2	2.3	133.3	233.3	0.37	841.3
Maximum	45.599	1.450	731.3	4.6	406.9	457.9	62.6	17.5
Minimum	0.000	0.078	39.9	0.2	5.3	2.05	-92.2	44.4
Std. Dev.	7.220	0.188	36.5	0.9	89.6	9.6	13.2	48.4

In table 1, mean value of Price Fragility, Value Premium, Price Earning Premium and Investor Sentiment Premium is ranging from 0.2 to 2.3 and Size Premium, Market Premium, Momentum Premium & Illiquidity are ranging 117 to 943. Median values PF is 0.004, VP, 0.88, SP is 113.2, PEP as 2.3, MP 133.3, MOM 233.3, ISP 0.37 and ILLIQ as 841.3. The maximum range of the values is from 1.45 to 458, and the minimum range of values is 0.000 to 44.4. Standard deviation is ranging from 0.2 to 48.4, where the maximum deviation is found in Illiquidity.

Table 2: Correlation Analysis

	PF	VP	SP	PEP	MP	MOM	ISP	ILLQ
VP	0.026	1						
SP	0.073	0.047	1					
PEP	0.186	-0.021	-0.238	1				
MP	0.071	0.013	0.328	-0.103	1			
MOM	0.071	0.0137	0.328	-0.103	1.00	1		
ISP	0.003	0.098	-0.002	0.023	-0.005	-0.005	1	
ILLQ	0.150	0.104	0.043	0.071	-0.095	-0.095	-0.095	1

**P < 0.01, *P < 0.05

The value premium is negatively correlated with price fragility at 0.026. Size premium is correlated with price fragility as 0.073 and with value premium as 0.047. Price earning premium is correlating fragility of prices as 0.186, negatively correlating -0.021 with value premium, -0.238 with size premium. Market premium is 0.071 correlated with price fragility, 0.013 with value premium, 0.238 with size premium. Momentum premium is correlated with funds fragility of price as 0.071, 0.013 with a premium of the fund value, 0.328 with size, negatively correlated as -0.137 with price-earnings premium. Moreover, investor sentiment premium is correlated with fragility 0.003, with value premium as 0.098, -0.002 with size premium, 0.023 with market premium and -0.05 with momentum premium. Similarly, Illiquidity is correlated 0.15 with fragility, 0.104 with value premium, 0.043 with size premium, 0.071 with price earning premium, -0.95 with market premium, momentum and investor sentiment

Table 3: Unit Root Test

Variable	R ²	DW	SE	Prob*
ILLIQ	0.36	2.07	0.09	0.000
MOM	0.66	2.04	0.14	0.000
MP	0.17	2.02	0.05	0.002
PEP	0.36	2.00	0.09	0.000
SP	0.22	2.05	0.09	0.016
VP	0.35	2.00	0.09	0.000
PF	1.04	2.00	0.09	0.000

The table used Augmented Dicky Fuller – Mackinnon, (1996) test that clarifies the serial correlation via Durbin Watson as 2.07 of Illiquidity, 2.04 of Momentum, 2.02 of Market premium, 2.00 of Price-Earnings Premium, 2.05 of Size premium, 2.00 of value premium and 2.00 of price fragility. Moreover, the results are discarding the null hypothesis of the unit root that value premium, size premium, price fragility, price earning, momentum, and illiquidity has no unit root 0.000 (p < 0.01). Residual Squares are ranging in 0.17 of momentum to 1.04 of price fragility. Also, the standard error is 0.05 to 0.14. Hence, the results explained no unit root in data.

Table 4: Auto Regressive Distributed Lag

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
PF (-1)	-0.18	0.09	-1.9	0.0520
VP (-1)	-7.71	3.7	-2.09	0.0384
SP (-4)	-0.02	0.007	-2.33	0.0214
PEP	1.18	0.66	1.76	0.0800
MOM	-0.004	0.008	-0.48	0.6299
ISP	-0.02	0.05	-0.43	0.6679
ILLQ(-1)	4.58	1.5	3.10	0.0025
R-sq.	0.31	MD Var		1.41
Adjusted R-sq.	0.20	S.D. Var		7.34
S.E.	6.55	Akaike info criterion		6.72
Log LH	-364.19	Hannan-Quinn Criterion		6.89
Prob(F-statistic)	0.011	DW		1.99

In the previous table, results are resulting serial correlation in data indicating to use more specified and sophisticated tools for further data analysis. However, as per unit root in data ARDL is deployed that resulted variables of study on the level and at first difference. Thus, price fragility, value premium, Illiquidity, and price earning premium are found negatively significant at first lag with 0.0520, 0.0384, 0.0025 & 0.0800 (p < 0.05). Size premium is found significant at SP (-4) 0.0214 (p < 0.05) with price fragility. Market premium is excluded from analysis due to the singular matrix having its contribution as zero. And momentum of equity funds and sentiments are found insignificantly affecting price fragility as 0.63 & 0.67 (p > 0.10). F stats is 0.011 (p < 0.01). There is low serial correlation compositely as 1.99 that the data is normal with 6.55 standardized errors of estimates, and R Square is low at 0.31. Therefore, trends of pricing multi-factors with price fragility is as follows,

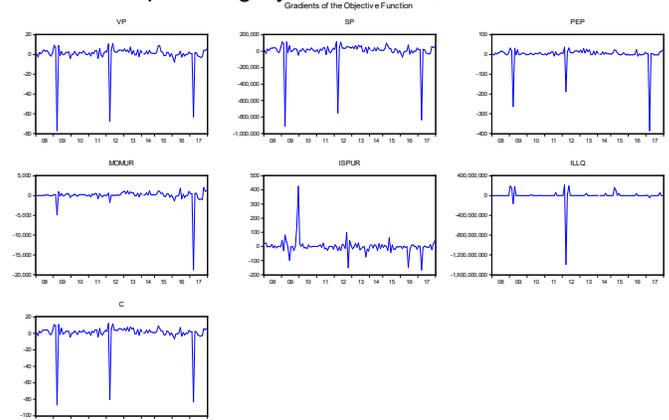


Figure 1: Gradient Graph of Pricing Factors and Price Fragility at Level and First Difference ARDL

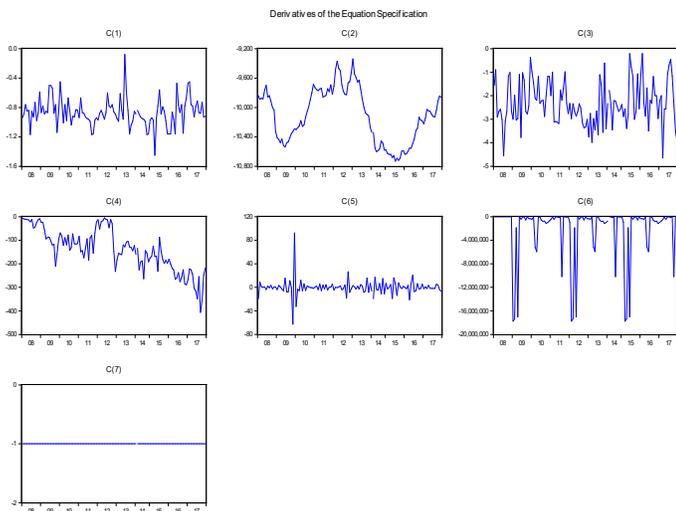


Figure 2: Coefficient Graph of Variables at First Difference and at Level in ARDL

Table 5: Variance Inflation Factor

VP	1.025888
SP	1.188325
PEP	1.069551
MOM	1.137008
ISP	1.022915
ILLQ	1.046536

To further elaborate lags at first difference, at level and graphics of study variables tested heteroskedasticity tests and found there is no heteroskedasticity with the values in desired criteria. Moreover, variance inflation factor is tested ranging 1.03 to 1.18 supporting results of ARDL test that the data is standard with no serial correlation compositely but exists variable wise individually and therefore to remove item wise serial correlation pricing factors are found significant at lags with price fragility.

Table 6: Robustness Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Break 1: 2008/01 – 2009/05				
VP	-44.9	17.6	-2.55	0.0122
PEP	4.7	1.84	2.60	0.0107
SP	0.04	0.01	4.03	0.0001
MOM	-0.09	0.08	-1.11	0.2716
ILLQ	1.09	3.34	3.27	0.0014
ISP	-0.36	0.30	-1.18	0.2381
C	-467.7	114.0	-4.10	0.0001
Break 2: 2009/06 – 2017/12				
VP	-2.18	3.46	-0.62	0.5306
PEP	0.99	0.74	1.33	0.1860
SP	-0.002	0.001	-0.99	0.3215
MOM	0.002	0.008	0.22	0.8212
ILLQ	3.37	1.56	2.16	0.0327
ISP	0.018	0.045	0.38	0.6980
C	19.4	19.87	0.97	0.3297
R-squared	0.34	Mean dependent var	1.39	
Adjusted R-squared	0.14	S.D. dependent var	7.22	
S.E. of regression	6.68	Akaike info criterion	6.74	
Sum squared resid	4603.26	Schwarz criterion	7.08	
Log-likelihood	-380.84	Hannan-Quinn criteria	6.88	
F-statistic	2.48	Durbin-Watson stat	2.098	
Prob (F-statistic)	0.005			

To robust, the study findings in ARDL results from Bai - Perron test is deployed by using the least square method

with breaks of data. Here R-Square is 0.34 in comparison to R square in table 4 as 0.31 as quite near to it. Durbin Watson is 2.098, and F Stats is quite parallel as 0.05 with 0.011 in ARDL table results. Thus, the results are robust as size premium, Price earning a premium, and Illiquidity is positively significant with price fragility at break one. While, value premium and constant are negatively significant, but momentum and investor sentiments are found insignificant with fragility. In second break results are non-robust, and data is found volatile in this break where VP, SP, PEP, MOM, ISP are insignificant, and Illiquidity is significant here. Market premium is found on a singular matrix and is excluded from the analysis. The findings are novel as resulting pricing factors participation in price fragility is more in short-run and less in the long run. Moreover, there are no fundamental and systematically adaptive trends in Pakistani stock exchange nor sentimental rituals with equity prices of funds. There is a random walk in market with generally equilibrium behavior.

4.1 Study Model after Results

The results of the study are proposing the following research model,

$$G_{it} = \alpha + \varphi_1(Vp)_{it} + \varphi_2(SP)_{it} + \varphi_3(PEP)_{it} + \varphi_4(ILLiq)_{it} + \varepsilon_{it} \quad (17)$$

The study found four variables impacting price fragility in generally equal mean variant and random trading behavior of Pakistani stock market. The abbreviations of variables are, G_{it} = Equity Price Funds Fragility, VP = Value Premium, SP = Size Premium, PEP = Price Earning Premium, Illiq = Illiquidity Premium, ε_{it} = error of i intersection at t time. The study aims to assess the role of equity fund prices on price fragility by investigating Pakistan stock exchange from January 2008 to December 2017. This research is segmented into two classification i-e conventional pricing factors and behavioral antecedents affecting price fragility. Literature indicated multiple pricing factors of conventional pricing system and behavioral anomalies affecting equity prices by making it fragile. Thus, it is framed to test these pricing factors affecting equity prices fragility in Pakistan. However, this testing procedure is facilitated to test market portfolios by decomposing them into the book to market ratio and size. Therefore, this research is answering about what pricing multifactor comprehend to use and what nature of their effects are on price fragility. Thus, Size, value, Illiquidity, market, and momentum premium are suggested by literature as conventional pricing factors. Price earning premium is another vital conventional factor of pricing included to uncover various unique issues. Moreover, investor sentiment is included as a behavioral factor consistent on herding behavior and disposition role of market players. Various theoretical gaps and empirical issues in PSX motivated to investigate this model to address price fragility conflict and short-term trading reversal attitude of market investors in PSX. The results are revealing that Value, size, Illiquidity are significantly affecting price fragility at p-value less than 0.10 level. It explains that an adverse change in equity price will be found by the change in size, value, and Illiquidity of equity funded portfolios. The results are supporting previous findings (Li, Wang, & Li, 2019) and hypothesis one, two, and four are accepted. Price earning premium is also found significant on price fragility revealing

that extensive cross trading of investors of short-term investors is enhancing fragility in funds prices. Moreover, it guides the trading path to arbitrage investor to follow this short-term trend and contribute to building thinness in equity prices that being far away from fundamental trading behavior, causes miss pricing in the market. Hence, it is the actual reason for less score of PSX price multiples in comparison to developed markets. Therefore, hypothesis five is also accepted. Market premium is excluded during data analysis by its uniform matrix nature, and the hypothesis is rejected. The results are also suggesting that there is insignificant participation of investor's sentiment and momentum in price fragility because investors are working with short term approach. Moreover, these sentiments are not consistent in the long run to predict momentum and sentimental behavior in equity portfolios. Moreover, investors are following a short trend and minutely disposing of their trading position that is uneasy to explain on consistent bases on price fragility of equities. Hence, hypothesis seven is also rejected. While marginal inconsistency failed to predict behavioral aspects effect on the fragility of prices. So, we used a Bi person test of robustness with the least square approach of breaks in data to capture sensed change in causal response. Thus, results concluded that conventional market factors of pricing are found significant on price fragility in short run but entirely insignificant in the long run. While there is no momentum and procedural behavior in kind of sentiments prevailing in PSX in both short-run and long run time break.

4.2 Research Implications & Limitations

The local exchange market is dynamic and theoretically, there is dire need to propose multiple contextual models for equity pricing and address mispricing issue in developing exchange markets. These models should cover contextual, conventional, anomalistic behaviors, earning motives, investor type, time-variant, sensitive, volatile, and liquidity-oriented determinants of equity prices. Secondly, Securities & Exchange Commission of Pakistan (SECP) and PSX should systematically develop a framework for the improvement of earnings multiples score because less score of PE multiples and price earning effect on price fragility of equities has an alarming signal. Thirdly, security exchange commission should impose tight limitations and legal bindings on extensive price-earnings by short investors and should motivate capital gain acquisition in investors by these. Forth, to maximize capital gain focus of short investor, there is a need to amend company laws of governance, and there is a high need to introduce corporate democratic culture. Fifth, to capture investor's sentiments a well versed and dynamic instrument should be launched by PSX because already available sentiments covering ingredients are not covering the scope and global sentiments proxies are not capturing real picture of local investor behavior. The literature is biased to study the

equity pricing factors of portfolios constructed by the stock market of Pakistan instead of studying single equity funds. To study the equity prices of portfolios are only to mean prices/returns of the portfolios due to investment diversification. There is no other way out for diversification. Moreover, rare studies have found that equity prices prediction is less efficient due to portfolios and have recommended to study equity wise, comparatively. Due to the entire focus on portfolio prices, firm characteristics are presenting insufficient information about to diversify funds and portfolio analysis. For more in-depth study, macroeconomic pricing factors and rational behavioral factors are not incorporated in the investigation model. The study is limited to the Pakistani context that is a contextual limitation.

4.3 Future Recommendations

The current study has found that pricing factors and fragility are predictable in short-run than long run because Pakistan has inconsistent economic system influenced by inconsistent political situations. In future research, political regimes of past ten to fifteen years and the public financial policies can be included. Moreover, a comparison of past policies with recent model can produce in-depth knowledge. Such analysis of political and financial aspects with price fragility can also segregate that either random walk and mean-variance behavior is an internal flaw of the stock market or it is spilt over by political policies fragility of national governments. Another study on price fragility and miss pricing in Pakistan and cross countries comparison can also present unique findings.

4.4 Conclusion

The results of the study are indicating that there is inconsistent behavior in Pakistani exchange, whereas, value fragility is a less known issue that has dynamic and volatile effects on different monetary elementary behaviors. The results highlighted that typical factors are moving around value fragility negatively in the short-run, and there are less momentum and mawkish behavior in it. In the long haul, there is no such quite important operating of typical and activity facet economic system. The per-unit amendment in size, illiquidity, price premium is inflicting uniform amendment in equity funds value structure in a short-run. However, market premium, momentum, and sentiments are not moving it. Moreover, value earning premium has considerably resulted in price fragility and have approved hypothesis that there is short run behavior in Pakistani exchange market inflicting multiple problems. Value earning premium is additionally found insignificant in the long haul. Hence, the findings of this analysis are coherent with theoretical bases in the native context.

REFERENCES

- [1] Abrate, G., & Viglia, G. (2016). Strategic and tactical price decisions in hotel revenue management. *Tourism Management*, 55, 123–132. <https://doi.org/10.1016/j.tourman.2016.02.006>
- [2] Accountant, C. M., Financial, C., & Bruce, R. (2004). What Does an Accountant in Business Do?

- Strategic Finance, 86(6), 21. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=28231533&site=ehost-live>
- [3] Accounting, E. M., & Nengzih. (2016). Corporate governance, Environmental Management Accounting and Financial Performance of

- Indonesia's State Owned Companies. *International Journal of Business, Economics and Law*, 9(1), 1–9.
- [4] Bear, R. M., & Curley, A. J. (2006). Unseasoned Equity Financing. *The Journal of Financial and Quantitative Analysis*, 10(2), 311. <https://doi.org/10.2307/2979038>
- [5] Boger, S. (2001). Quality and contractual choice: a transaction cost approach to the polish hog market. *European Review of Agriculture Economics*, 28(3), 241–262. <https://doi.org/10.1093/erae/28.3.241>
- [6] Campbell, J. Y., Giglio, S., & Pathak, P. (2011). Forced Sales and House Prices. *American Economic Review*, 101(5), 2108–2131. <https://doi.org/10.1257/aer.101.5.2108>
- [7] Chakraborty, N., Elgammal, M. M., & McMillan, D. (2019). Rational functions: an alternative approach to asset pricing. *Applied Economics*, 51(20), 2091–2119. <https://doi.org/10.1080/00036846.2018.1540848>
- [8] Chartered Institute of Management Accountants. (2013). Report puts business models at the heart of integrated reporting. *Financial Management*, 63(1), 63.
- [9] Bowman, C., Ward, K., & Kakabadse, A. (2002). Congruent, Divergent and Incoherent Corporate Level Strategies. *European Management Journal*, 20 (6) 671-679
- [10] Dubé, E., Gignac, C., & Racicot, F.-E. (2008). Revisiting the Fama and French model. In *Funds of Hedge Funds* (pp. 287–307). <https://doi.org/10.1016/b978-075067984-8.50021-3>
- [11] Dumas, B. (2003). Financial modelling in corporate management. *European Journal of Operational Research*, 13(1), 103–104. [https://doi.org/10.1016/0377-2217\(83\)90010-3](https://doi.org/10.1016/0377-2217(83)90010-3)
- [12] Elton, E. J., Gruber, M. J., Elton, E. J., Gruber, M. J., & Blake, C. R. (2011). Common Factors in Active and Passive Portfolios. In *Investments and Portfolio Performance* (pp. 279–304). https://doi.org/10.1142/9789814335409_0014
- [13] Faff, R. W. (2003). Creating fama and french factors with style. *Financial Review*, 38(2), 311–322. <https://doi.org/10.1111/1540-6288.00048>
- [14] Fama, E., & French, K. (2012). Size, Value, and Momentum in International Stock Returns *Journal of Financial Economics*, 105 (3). <https://doi.org/10.2469/dig.v42.n4.49>
- [15] Fehle, F., Fournier, S. M., Madden, T. J. & Shrider, D. G. (2008). Brand value and asset pricing. *Quarterly Journal of Finance & Accounting*, 47(1), 59–82. <https://doi.org/http://www.qjbe.unl.edu/>
- [16] Emery, D. R., Finnerty, J. D., & Stowe, J. D. (2007). *Corporate Financial Management*. 3rd ed. Person.
- [17] Gerstner, E., & Hess, J. D. (2002). Why do Hot Dogs Come in Packs of 10 and Buns in 8s or 12s? A Demand-Side Investigation. *The Journal of Business*, 60(4), 491. <https://doi.org/10.1086/296410>
- [18] Gharghori, P., Chan, H., & Faff, R. (2007). Are the Fama-French Factors Proxying Default Risk? *Australian Journal of Management*, 32(2), 223–249. <https://doi.org/10.1177/031289620703200204>
- [19] Greenwood, R., & Thesmar, D. (2011). Stock price fragility. *Journal of Financial Economics*, 102(3), 471–490. <https://doi.org/10.1016/j.jfineco.2011.06.003>
- [20] Hameed, A., & Ashraf, H. (2006). Stock market volatility and weak-form efficiency, evidence from an emerging market. *Pakistan Development Review*, 45(4). 1029–1040
- [21] Happ, J. (1996). Presentation: Fama & French (1996). *The Journal of Finance*, LI(1), 55–84. <https://doi.org/10.2307/2329302>
- [22] Hau, H. (2011). Global versus local asset pricing: A new test of market integration. *Review of Financial Studies*, 24(12), 3891–3940. <https://doi.org/10.1093/rfs/hhr094>
- [23] Ho, K. H., Sun, J. (2014). Explaining Housing Market Dynamics within a Dynamic Factor Approach: Economic Interpretation and Estimation. *Journal of Real Estate Portfolio Management*, 20(1), 47–66.
- [24] Jaffee, D., Stanton, R., & Wallace, N. (2018). Energy Factors, Leasing Structure and the Market Price of Office Buildings in the U.S. *Journal of Real Estate Finance and Economics*. <https://doi.org/10.1007/s11146-018-9676-x>
- [25] Jiao, W., & Liliti, J.-J. (2017). Whether profitability and investment factors have additional explanatory power comparing with Fama-French Three-Factor Model: empirical evidence on Chinese A-share stock market. *China Finance and Economic Review*, 5(1). <https://doi.org/10.1186/s40589-017-0051-5>
- [26] Karolyi, G. A., & Stulz, R. M. (2003). Chapter 16 Are financial assets priced locally or globally? *Handbook of the Economics of Finance*. [https://doi.org/10.1016/S1574-0102\(03\)01025-2](https://doi.org/10.1016/S1574-0102(03)01025-2)
- [27] Kim, K.-H., Kim, M., & Qian, C. (2018). Effects of Corporate Social Responsibility on Corporate Financial Performance. *Journal of Management*, 44(3), 1097–1118. <https://doi.org/10.1177/0149206315602530>
- [28] Kim, J. H., Rahman, M. L & Shamsuddin, A. (2018). Can energy prices predict stock returns? An extreme bounds analysis. *Energy Economics*, 81, 822-834
- [29] Lauridsen, J., Nannerup, N., & Skak, M. (2008). Dynamic and Geographic Variation in Determinant Effects on Home Ownership. *Discussion Papers on Business and Economics*.
- [30] Leathers, C. G. (2016). A Guide to What's Wrong with Economics. *Journal of Economic Issues*, 40(3), 841–843. <https://doi.org/10.1080/00213624.2006.11506956>
- [31] Li, Z., Wang, J., & Li, K. (2019). Digital Assets Price Forecast Based on POW Mining Mechanism. *Open Journal of Social Sciences*, 7(2), 185–198. <https://doi.org/10.4236/jss.2019.72016>
- [32] Liang, S. X. (2018). The systematic pricing of market sentiment shock. *European Journal of Finance*, 24(18), 1835–1860. <https://doi.org/10.1080/1351847X.2018.1491875>
- [33] Malvido Perez Carletti, A., Hanisch, M., Rommel,

- J., & Fulton, M. (2018). Farm Gate Prices for Non-Varietal Wine in Argentina: A Multilevel Comparison of the Prices Paid by Cooperatives and Investor-Oriented Firms. *Journal of Agricultural and Food Industrial Organization*, 16(1). <https://doi.org/10.1515/jafio-2016-0036>
- [34] Mariano, C., Niziel, Q., Sardon, J., & Ray, C. (2016). Investigation of the Factors Affecting Real Exchange Rate in the Philippines. *Review of Integrative Business and Economics Research Online CDROM*, 5(4), 171–202. Retrieved from http://sibresearch.org/uploads/3/4/0/9/34097180/riber_s16-073_171-202.pdf
- [35] Markets, F. (2012). Corporate governance and the market value of firms. *Economics, Management and Financial Markets*, 7(4), 227–232.
- [36] Misund, B. (2018). Common and fundamental risk factors in shareholder returns of Norwegian salmon producing companies. *Journal of Commodity Markets*, 12, 19–30. <https://doi.org/10.1016/j.jcomm.2017.12.007>
- [37] Mondal, A., & Ghosh, S. K. (2012). International journal of financial management. *International Journal of Financial Management*, 2 Retrieved from <http://www.i-scholar.in/index.php/ijfm/article/view/40889>
- [38] Nuryanah, S., & Islam, S. M. N. (2015). Corporate Governance and Financial Management. *Corporate Governance and Financial Management*. <https://doi.org/10.1057/9781137435613>
- [39] Peterson, D. (2013). Three Approaches to Valuing A Privately Held Company. *Financial Executive*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=84669364&lang=ru&site=eds-live&authtype=uid>
- [40] Petkova, R. (2006). Do the Fama-French factors proxy for innovations in predictive variables? *Journal of Finance*, 61(2), 581–612. <https://doi.org/10.1111/j.1540-6261.2006.00849.x>
- [41] Raza, S. A., Abdullakutty, F. C., & Rathinam, S. (2016). Joint determination of process mean, price differentiation, and production decisions with demand leakage: A multi-objective approach. *Applied Mathematical Modelling*, 40(19–20), 8446–8463. <https://doi.org/10.1016/j.apm.2016.02.043>
- [42] Riaz, A. & Mi, H. (2017). China-Pakistan Economic Corridor and Its Social Implication on Pakistan: How Will CPEC Boost Pakistan's Infrastructures and Overcome the Challenges?. *Arts & Social Science Journal*, 8: 265. doi:10.4172/2151-6200.1000265
- [43] Sharif, T., Purohit, H., & Pillai, R. (2015). Analysis of Factors Affecting Share Prices: The Case of Bahrain Stock Exchange. *International Journal of Economics and Finance*, 7(3). <https://doi.org/10.5539/ijef.v7n3p207>
- [44] Sharma, M., & Prashar, E. (2013). A Conceptual Framework for Relative Valuation. *The Journal of Private Equity*, 16(3), 29–32. <https://doi.org/10.3905/jpe.2013.16.3.029>
- [45] Shen, J., Pretorius, F., & Chau, K. W. (2018). Land Auctions with Budget Constraints. *Journal of Real Estate Finance and Economics*, 56(3), 443–471. <https://doi.org/10.1007/s11146-017-9618-z>
- [46] Shi, Q., Darrat, A. F., Li, B., & Chung, R. (2013). Technology prospect and the cross-section of stock returns: Evidence from the Australian market. *Corporate Ownership and Control*, 11(1 C), 295–303. <https://doi.org/10.22495/cocv11i1c2art7>
- [47] Sopranzetti, B. (2015). Liquidity Risk and Performance Attribution. *Journal of Performance Measurement*, 20(2), 7–10. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=119577239&site=ehost-live>
- [48] Tina C. Chiao. (2011). How the information precision and the information frequency observed affect the stock market equilibrium., *African Journal of Business Management* 5(29). <https://doi.org/10.5897/ajbm11.968>
- [49] Trimech, A., Kortas, H., Benammou, S., & Benammou, S. (2009). Multiscale Fama-French model: application to the French market. *Journal of Risk Finance*, 10(2), 179–192. <https://doi.org/10.1108/15265940910938251>
- [50] Vidović, J., Pokleповić, T., & Aljinović, Z. (2014). How to Measure Illiquidity on European Emerging Stock Markets?, *Business Systems Research*, 5(3), 67-81. DOI: 10.2478/bsrj-2014-0020
- [51] Vogiazas, S., & Alexiou, C. (2017). Residential Property Price Determination and Bubble Detection: Evidence from Seven Advanced Economies. *Atlantic Economic Journal*, 45(1), 119–131. <https://doi.org/10.1007/s11293-017-9531-0>
- [52] von Habsburg, E., Goodman, R., Johns, G., & McAndrew, C. (2015). Art Appraisals, Prices, and Valuations. In *Fine Art and High Finance* (pp. 31–62). <https://doi.org/10.1002/9781119204688.ch2>
- [53] Wang, Y. C., Wang, C. W., & Huang, C. H. (2015). The impact of unconventional monetary policy on the tail risks of stock markets between U.S. and Japan. *International Review of Financial Analysis*, 41, 41–51. <https://doi.org/10.1016/j.irfa.2015.05.020>