Impact of Stock Market-specific and Macro-economic Variables on Stock Return[1]

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Abstract

The study was aimed to examine the impact of stock market-specific variables and macro-economic variables on stock return. It has analyzed the data of 25 countries for a period of 22 years from 1995 to 2016. The major three tests; regression analysis, co-integration analysis, and causality have been examined. The results have shown from the evidence of regression analysis and causality that the impact of the stock market-specific and macro-economic variables have been varied as per the different situation and country. Whereas, the impact of stock market-specific and macro-economic variables have been found to be consistent in the long run. Therefore, the conclusion was drawn that in the long run the relationship between stock return and stock market-specific, as well as macro-economic variables can be generalized but in the short run better not to generalize. The findings have shown that stock market-specific variables have better explaining and predicting power than macro-economic variables. In the case of stock market-specific variables, size and stock traded turnover ratio have found equally important to understand the behavior of sock return. In the case of macro-economic variables, GDPGR has found the most important variable followed by money supply, exchange rate, interest rate, trade openness, and inflation rate respectively. Finally, it has been concluded that the behavioral aspects of the investors have been missing. So, the financial theories incorporating the behavioral aspects would explain and predict better rather than economic physiognomy only.

Keywords: regression, co-integration, causality, stock market-specific variables, and macro-economic variables.

Introduction

Background of the study

Stock markets are the barometer of the overall economy. It has been holding immense attention to scholars, academicians, and policymakers. The huge literature has been proved that the stock market replicates the overall economy of the nation. History has shown that the stock market is an important aspect of dynamic economic activities and has been performing a crucial role in the economy of any country. Moreover, many researchers have argued that the stock market has been playing an important role in economic prosperity; fostering capital formation and sustaining the economic growth of the economy. Stock return affects; the wealth of households, their consumption, savings, and investment decisions. Among all the pillars of the economy, the stock market is one of the most important ingredients of a free market economy. It has been supporting capital formation through shareholders and in turn, providing the return and ownership to them. People invest their money in stock to get the return, which is influenced by various unknown forces. The absolute number of these variables has not tagged so far.

Fundamentally, the discussion regarding predictions of stock price behavior has been started with the study of (Markowitz, 1952) the article of Portfolio Selection. Markowitz assumed that the estimation of stock return is possible by developing a model. However, such assumptions do not exist in the real world. The model developed by Markowitz allows measuring the risk and return. The investors maximize returns for the given level of risk or reduce the cost for the given level of return. As per the Markowitz Portfolio Theory, investors choose the optimum investment portfolio, which is available in the curve. The risk seeker investors choose the upper part of the curve and risk averter investors choose a lower part of the curve. It has mentioned that variance in the rate of return is measured by market risk. The model argued that the total risk has been reduced by portfolio selection.

The literature on determinants of stock returns in the empirical capital markets has been indicated that several factors potentially interpreted the abnormality in stock return beyond a single market factor. In this regard two notable theories are very common in predicting the relationship between stock return and fundamental variables, the first one is Capital Asset Pricing Model (CAPM) and the second is Arbitrage Pricing Theory (APT).

Till the 1990s the variables were used to be chosen on the basis of popularity among the practitioners, instead of explicit theoretical study. But Fama (1981) suggested reasons behind choosing variables, to explain stock return through explicit theoretical study. However, there are other empirical evidences, (Basu, 1977), (Banz, 1981). (Fama& French, 1992), among others which demonstrate the inability of market risk factor (beta) in fully explaining the common stock returns as opposed to that suggested by the CAPM. The CAPM was developed in the 1960s (Sharpe, 1964), (Lintner, 1965) and (Mossin,

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1966) have been specified Markowitz mean-variance portfolio theory into a testable prediction regarding the relationship between risk and expected rate of return by identifying a portfolio. The issue here is the difference in an individual's experience and level of knowledge might differ in setting logical parameters and values in every human being. It indicates that two different individuals might come up with different conclusions and results from the same evidence and information. This has explored two sides of the market. An investor who has a significant amount of money in the stock market may prefer to stay out of an overextended stock regardless of information.

Considering the suggestion of Akpo (2015) that the multi-factor model does explain how to maximize return at least cost, this study has been conducted considering the multi-variable model, in the context of Asian countries' stock market. This study has been attempting to examine, the influential stock market-specific variables; size and stock traded turnover ratio and macro-economic variables; money supply, trade openness, GDP-GR, inflation rate, exchange rate and interest rate from the evidence of Asian Stock Markets. The financial theory showed there has been a negative relationship between stock return and size, whereas the positive relationship between stock return and stock traded turnover ratio. Similarly, there has been a positive relationship between money supply, GDP-GR, exchange rate and negative relationship between stock return and trade openness, inflation rate, and interest rate. This study has been attempting to examine the relationship between stock return and fundamental variables from the evidence of Asian countries. Thus, let's put some light on the Asian countries' economy.

Asian countries and stock markets

Asia Continent has been holding a significant position in terms of area, population, and economic activities in the global context. This continent consists of fifty-one nations as per the report of IMF (2017). Based on the GDP per capita, Qatar has been standing in the first position with 78,829 US dollars per capita followed by Singapore and Israel, whereas Afghanistan has been taking place at last with the lowest GDP per capita with 528 US dollars followed by Nepal and Tajikistan. On the other hand, considering GDP national, China has been standing in the first position with 11,384,763 billion US dollars followed by Japan and India. But from the least GDP Timor has been followed by Bhutan and Maldives. Considering the listed companies in the stock market India has been holding the first position with 7,391 listed companies, followed by Japan and China. While considering the investment opportunities globally, there has been a penalty of opportunities to invest outside North America and Europe. Asia has been holding immense attention of investors to invest, by developing robust financial markets representing trillions of dollars. Any market has to offer some interesting investment opportunities to be large. The region of Asia has been divided into developed and developing economies. The highly developed countries included Japan and four countries; often referred to as the Asian Tigers (Hong Kong, Singapore, South Korea, and Taiwan). Major players, among the other powerhouse, include China, India, and Malaysia. These nations are a major economic power, but academics often have been debating whether or not they can be classified as developed. Malaysia, for example, has been a major source of scientific innovation yet failed to be fully recognized as a developed nation.

The Asian market had a stock exchange for more than ten decades; they did not rise to prominence until the Second World War. Japan set the pace with protectionist policies and a strong central government-led development effort that turned the country into an exporting powerhouse. In time its neighbors soon took notice of the trend. A host of other nations, including Hong Kong, Singapore, South Korea, Taiwan, Vietnam, Thailand, India, and China began a period of industrialization in the early 1960s that has been continued still in the twenty-first century. These nations increased the global marketplace by exploring mass production, with the injection of a large amount of foreign direct investment capital; the Asian Tiger's economy grew substantially between the late-1980s and mid-1990s.

Statement of the problem

This study has focused on the relationship and causality between stock return and its fundamental variables over the period 1995 to 2016, across the Asian Countries. The primary assumption is that stock return can be interpreted as a proxy for the overall performance of the national economy. The explaining variables have been chosen macro-economic and stock market-specific. It has attempted to examine the short-term relationship, long-term relationship, and causality between stock return and its fundamental variables, in Asian stock markets. The size has been a negative relationship with the stock return (Chang, 1991). The relationship between volatility and stock returns has been found mixed result, the association between stock return and stock traded turnover ratio has been negative (Kouwenhorst, 1998). There has been a positive association between stock return and stock traded turnover ratio (Dey, 2005). The empirical relationship between stock traded turnover ratio and stock return in the Chinese stock market by using Granger Causality and VAR Model found that turnover ratio has little influence on stock return. There was a positive relationship between the stock return and the money supply. Haque (2013) examined the significant determinants of equity returns in Pakistan by using an unbalanced panel data of 394 non-financial firms, listed in the Karachi Stock Exchange throughout 1998-2009. The result showed that volatility has a positive relationship with stock return. The pooled mean group estimators have used to test for unbalanced panel data for 87 countries, over the period (1960-2005), the study shows that the long-run relationship between two policy variables. There has been less association between trade openness and economic growth (Sarkar, 2008). The study has examined the relationship between trade openness and economic growth of 51 less developed countries. There was a lack of consistent positive relationship between the stock return

and inflation, (Gultekin, 1983). The gross domestic product, which holds significant explaining power to the stock returns. The relationship between economic growth and stock returns of the selected Asian Countries has positive relations (Chancharoenchai, 2005). The observed relationship between stock returns and exchange rate and has established a negative relationship (Tian, 2010). The study was done by using the ARDL co-integration approach.

This study aims to fill this void and attempted to indicate the expected result of such an award. The following specific issues have been dealt:

1. How the fundamental variables, size (MC in the percentage of GDP), stock trade turnover ratio, trade openness, money supply, inflation rate, GDP-GR, interest rate, and exchange rate explain the relationship with the stock return?
2. What is the long-term relationship and direction between stock return and its fundamental variables?
3. Whether there is bidirectional, or unidirectional or no causal relationship existed between stock return and its fundamental variables?

Objectives of the study

The study has a core objective to examine the relationship, long-term relationship, and causality between the stock returns and its fundamental variables cross-over the countries from the evidence of Asian Stock Markets. The following specific objectives have been dealt:

1. To examine the relationship between stock return and fundamental variables; size (MC in the percentage of GDP), stock trade turnover ratio, trade openness, money supply, inflation rate, GDP-GR, interest rate and exchange rate from the evidence of Asian Stock Markets.
2. To analyze the long-term relationship and direction between stock return and its fundamental variables.
3. To observe the causal relationship between stock return and its fundamental variables.

Figure-1: Theoretical Framework
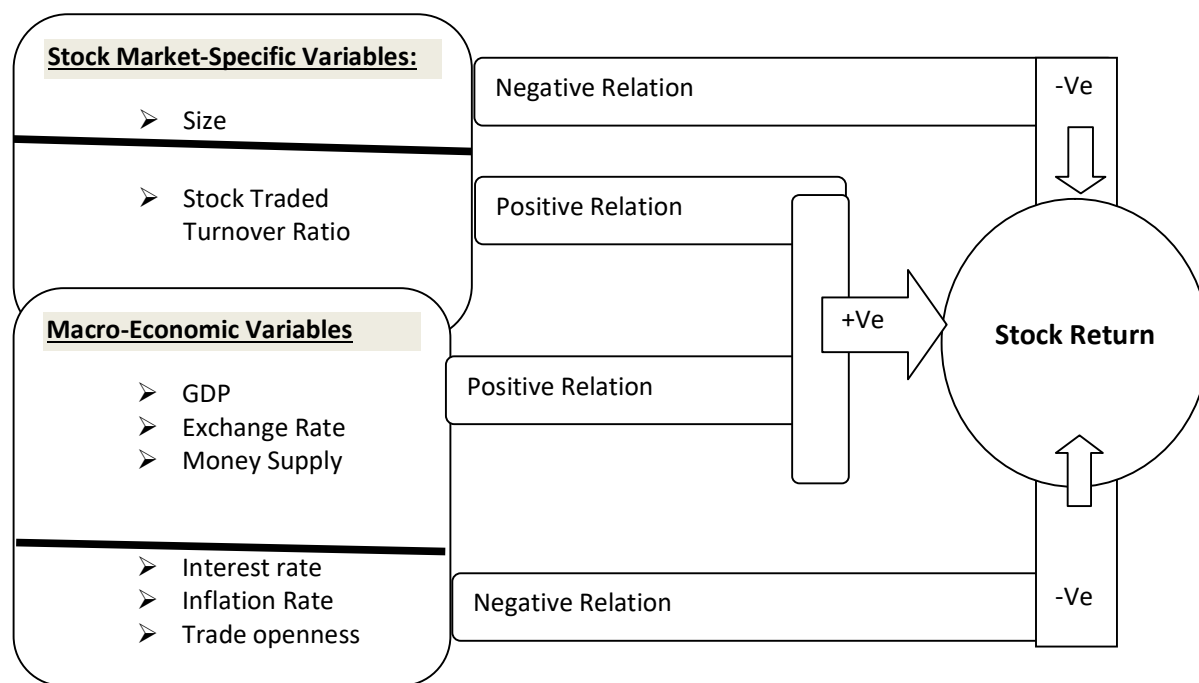
Methodology

Aergis, Filippidis & Economidou (2007) argued that there have been four views on financial growth. The first one was the supply-leading view, which supports a positive impact of financial development on economic growth. According to this approach, there has a robust effect that runs from financial intermediation to economic growth and is expressed either by raising the efficiency of capital accumulation or by raising the saving rate and thus the investment rate. Secondly, the demand leads view, which stated that finance responses to change that happened in the real sectors or where enterprise leads, financial flow. The supply leading views has not denied that there might be reverse causation from growth to finance rather it stresses that the financial-growth was robust to such reverse causation. The third one is that somewhere between these two views have a mutual impact. Some of the studies have argued that there has been a bi-directional relationship.This study has been standing in line with a relationship between financial development and economic growth.The stock market has replicated the economic condition of the nation.

Christopoulos & Tsionas (2004) examined the panel cointegration analysis to examine whether a long-run relationship between financial development and economic growth exists. The findings were supportive of a unique

cointegration vector between growth, financial development, investment shares, and inflation. The use of panel cointegration tests (Pedroni, 1999) allowing for heterogeneity in coefficients and dynamics across units, which enabled to determine the long-run structure of the financial development and economic growth avoiding well known lacking that occur in using traditional (time-series) cointegration testing low power due to small samples. The cointegration vectors are estimated using dynamic OLS procedure, which allows for consistent and efficient estimators and takes into account the integration and cointegration properties of the data. However, the time-series analysis has been done for the long-run relationship and direction of the causality of each nation to robust the findings. The co-integration relationship has been examined by using Johnsen Co-integration Test.

Nature and sources of data

The secondary data have been used for the analysis and examination of results. However, after getting certain findings from the secondary data analysis, the findings have been compared with the findings of the previous studies. Secondary data have been collected from reliable sources; the World Bank data set, which had provided by the selected nations. The sources have been quoted as per the necessity.

Population and samples

As per the report of the World Bank in 2017, there have been fifty-one countries in Asia which have been presented in the following table:

Table-2: Asian countries in alphabetical order

A	Afghanistan	I	India	M	Macau	S	Saudi Arabia
	Armenia		Indonesia		Malaysia		Singapore
	Azerbaijan		Iran		Maldives		Sri Lanka
B	Bahrain		Iraq		Mongolia		Syria
	Bangladesh		Israel	N	Nepal	T	Taiwan
	Bhutan	J	Japan		North Korea		Tajikistan
	Brunei		Jordon	O	Oman		Thailand
C	Cambodia	K	Kazakhstan	P	Pakistan		Turkey
	China		South Korea		Palestine		Turkmenistan
	Cyprus		Kuwait		Philippines	U	UAE
E	East Timor		Kyrgyzstan	Q	Qatar		Uzbekistan
G	Georgia	L	Laos	R	Russia	V	Vietnam
H	Hong Kong		Lebanon			Y	Yemen

Source: World Bank Report, 2017

The analysis of merely the secondary data could be questionable. But the findings have been compared with the previously established theories and a logical conclusion. So, it was presumed that the study has been holding the essence of systematic study. Among all the fifty-one nations of Asia Continent, the following three criteria have been set to draw the sample countries:

1. The country should have a separate identity as a separate nation.
2. The country should have submitted their statistical information to the World Bank.
3. The country should have located in Asia Continent only.

Considering the above-mentioned criterion, Taiwan, Hong Kong, and Macau have excluded from the study because these countries have belonged to China. This study has not considered dependencies as separate nations. So, the total population of the study has been all forty-eight nations of Asia Continent. Out of them Russia, Georgia, Turkey, Azerbaijan, Armenia, and Cyprus have been excluded from the study because these countries occupy some parts of Asia and some parts in other continent. Furthermore, Afghanistan, Bhutan, Brunei, Cambodia, East Timor, Georgia, Iraq, Laos, Maldives, Magnolia, Myanmar, North Korea, Palestine, Syria, Tajikistan, Turkmenistan, Uzbekistan, and Yemen have not been submitted their report to World Bank and their information are not available so, these countries have been also excluded. Remaining twenty-five nations have considered as the sample for the study. The categorization and selection of the sample countries has been based on the IMF report. The detailed information of sampled countries has been presented in the following table.

Table-3: Sampled countries

B	Bahrain	J	Japan	N	Nepal		Saudi Arabia
	Bangladesh		Jordon	O	Oman	S	Singapore

C	China		Kazakhstan	P	Pakistan		Sri Lank
	India	K	South Korea		Philippines	T	Thailand
I	Indonesia		Kuwait	Q	Qatar	U	UAE
	Iran	L	Lebanon			V	Vietnam
	Israel	M	Malaysia				

Model specification

Regression model

$(SR)_i = \beta 0 + \beta 1(SIZE)_{1i} + \beta 2\ (STTR)_{2i} + \beta 3(MS)_{3i} + \beta 4(TO)_{4i} + \beta 5\ (GDPG)_{5i} + \beta 6(INF)_{6i} + \beta 7\ (ER)_{7i} + \beta 7\ (IR)_{8i} + u_i \ldots\ldots\ldots\ldots\ldots(1)$

The empirical work was based on panel data. Regression can then capture both variation on cross-section data, and variation over time. Another advantage of using panel data is that it allows for heterogeneity. Furthermore, the number of observations available when testing the stationary of the residual series in a level regression is greatly increased in a panel framework and this can substantially increase the explaining power of the determining variables.

Cointegration test

For the examination of the long-run relationship between the stock return and its fundamental variables, the cointegration test has examined.

$y_{it} = a0_i + a1_iF_{it} + a2_iX_{it} + e_{it}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$

Where y_{it} representing stock return; F_{it} refers to explaining variables; X_{it} stands for a set of control variables, and e_{it} is the error term. For the interpretation of the interesting and debatable issue, which variables do really on the influence the stock return. It has considered the two stock market-specific variables; size and stock traded turnover ratio and six macro-economic variables; GDP growth rate, inflation rate, exchange rate, trade openness, money supply and interest rate. The set of control variables, X_{it} has incorporated the years of schooling to control the level of human capital, foreign direct investment to incorporate international relation, use of internet, population growth rate, government and education.

$y_{i,t} = \rho_iy_{i,t-1} + \sum_{j=1}^{\rho} \emptyset_{ij}\Delta y_{i,\ t-j} + Z_{i,t}\gamma + \varepsilon_{I,t}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$

Where y_{it} stands for each variable under consideration in the model, ρ is the number of lags for correlation-free residuals, $z_{i,t}$ represented the vectors of determinist variables in the model including and fixed effects or individual trends and γ is the cross-ponding vector of coefficients.

The null hypothesis of a unit root is ($\rho_i = 0$ for all i) and the alternative hypothesis is no unit root ($\rho_i > 0$ for some i – 1, 2…..N_1 and $\rho_I = 0$ for i = N_1 +1,.., N, where N is the number of cross-sections) and then tested. Instate of pooling the data and assuming that ρ_i is the same for all members (as in Levin et al. 2002), IPS use separate unit root tests for the N cross-sections unit. The test statistic in a panel context suggested by IPS, denoted as t-bar, is the average of individual ADF statistics and is defined as: $\bar{t}\ = \frac{1}{N}\sum_{i=1}^{n}(t_{pi})\ldots\ldots(4)$

Where t_{pi} is the individual t-statistic for testing the null hypothesis. Under the null hypothesis of non-stationarity IPS show that the $\bar{t}$ – statistic followsasymptotically a standard normal distribution. IPS provide simulated critical values of $\bar{t}$ for different number of cross-sections N, series length T and Dickey-Fuller regression containing intercepts only or intercepts and linear trends.

Panel cointegration analysis

Once the order of stationarity has been defined, the next step is to apply panel co-integration methodology, developed by (Pedroni, 1999). The IPS unit-root test, panel co-integration tests also take heterogeneity into accountusing specificparameters, which are allowed to vary across individual members of the sample. The first step to applying (Pedroni, 1999) test for the null hypothesis of no cointegration is to compute the regression residuals from the hypothesized cointegrating regression. In the most general case, this may take the from:

$y_{it} = a'_i + \ddot{a}_{it} + \hat{a}_{1i}X_{1i,t} + \hat{a}_{2i}X_{2i,t} + \ldots\ldots + \hat{a}_{mi}X_{mi,t} + e_{i,t}\ldots\ldots\ldots(5)$

Where, y_{it} refers the stock return, a'_i denotes the constant, $\ddot{a}_{it}$ is the deterministic time trend that is specific to individual members of the panel. T refers to the number of observations over time; i refers to the number of individual members in the panel; $X_{1i,t}, X_{2i,t}, \ldots\ldots, X_{mi,t}$ refers to the number of regression variables; $\hat{a}_{1i}, \hat{a}_{2i}, \ldots.. \hat{a}_{mi}$ is the slope coefficients.

Panel causality

Firstly, it has explored the direction of the panel causal links among the variables under consideration. To estimate using causality thePooled MeanGroup (PMG) estimator of (Pesaran et al., 1999) has employed. For this purpose, specified an error correction VAR model of the form:

$\Delta y_t = \alpha_0 + \alpha_1t + \beta_1y_{t-1} + \beta_2X_{t-1} + \sum_{i=1}^{p-1} \phi_i\Delta y_{t-i} + \sum_{i=1}^{q-1} \theta_i\Delta X_{t-I} + \omega\Delta X_t + \varepsilon_t\ldots\ldots\ldots\ldots\ldots(6)$

Where, y_t represents the dependents variable, X_t is a vector of possibly long-run forcing variables, β_1 and β_2 are the respective long-run multipliers and $\phi \& \theta$ represent the short-run dynamic coefficients. By interchanging y_t and X_t as dependent and independent variables in the above regression, it is possible to examine that null hypothesis of the non-existence of a long-run relationship $H_0: \beta_1 = 0 \& \beta_2 = 0$ and the $H_1: \beta_1 \neq 0 \& \beta_2 \neq 0$, the alternative hypothesis, the existence of a long-term relationship.

Results and discussions

Table-4: Regression result of the stock market of all sampled twenty-five countries

Model	Constant	Size	STTR	MS	TO	GFPGR	INF	ER	RIR	F-value
Model:1	−0.166	0.83	6.77	−0.123	−2.01	−1.382	5.565	−3.225	4.001	4.09
(Nepal)	(−1.0)	(1.2)	(1.9)	(−0.18)	(−0.8)	(−0.3)	(0.707)	(−1.50)	(1.205)	
Medel:2	0.110	−0.48	−0.002	0.179	2.674	0.591	4.542	0.825	−3.103	0.44
Pakistan	(0.76)	(−0.9)	(−0.06)	(0.122)	(0.81)	(0.34)	(1.08)	(0.635)	(−1.70)	
Model:3	0.156	2.02	−0.56	−0.57	0.216	0.437	−9.411	−5.022	−18.25	1.85
Bangladesh	(0.77)	(1.7)	(−0.7)	(−0.47)	(0.13)	(0.07)	(−0.45)	(−0.196)	(−4.73)	
Model:4	−0.64	1.07	0.22	1.058	−0.75	0.120	13.59	0.113	4.380	5.91
India	(−2.2)	(3.4)	(1.58)	(0.50)	(−0.3)	(0.01)	(1.355)	(0.212)	(0.714)	
Model:5	0.063	−1.6	1.20	−0.136	0.034	5.624	−6.98	−4.005	0.770	4.77
Vietnam	(0.67)	(−1.7)	(3.01)	(−0.177)	(0.03)	(3.03)	(−1.03)	(−1.92)	(0.348)	
Model:6	0.49	−0.43	−0.70	0.243	−0.02	−1.010	−8.377	−1.121	−2.903	2.08
Philippines	(2.4)	(−1.5)	(−1.2)	(0.104)	(−0.3)	(−0.1)	(−1.29)	(−0.86)	(−0.69)	
Model:7	0.75	−1.86	0.223	−4.734	1.880	3.138	2.106	0.284	0.331	2.22
Indonesia	(1.1)	(−1.4)	(0.22)	(−1.78)	(0.73)	(1.07)	(0.264)	(0.492)	(0.097)	
Model:8	−0.12	0.99	1.15	−5.21	−1.05	−4.514	−6.29	−2.050	−0.783	2.32
Sri Lanka	(−0.7)	(1.15)	(1.02)	(−2.68)	(−1.6)	(−2.5)	(−1.67)	(−1.24)	(−0.321)	
Model:9	0.85	−2.3	−0.70	0.079	−5.98	0.173	−8.100	0.496	1.00	2.34
Iran	(1.9)	(−2.1)	(−0.32)	(0.069)	(−1.1)	(0.09)	(−1.96)	(2.038)	(0.395)	
Model:10	−0.34	−0.78	1.38	−1.249	−0.33	−7.210	−8.251	0.441	−10.24	10.2
Thailand	(−0.9)	(−2.6)	(3.59)	(−0.79)	(−0.2)	(−1.1)	(−1.82)	(0.220)	(−2.33)	
Model:11	0.002	−0.03	−0.07	−0.116	−0.07	−0.612	0.534	2.081	0.092	30.3
Jordan	(0.44)	(−2.3)	(−1.589)	(−1.098)	(−0.2)	(−1.0)	(0.642)	(0.524)	(0.205)	
Model:12	0.14	0.336	0.260	1.476	2.086	5.314	−3.238	−8.669	7.037	14.1
China	(1.3)	(1.001)	(2.78)	(4.739)	(1.52)	(1.91)	(−0.51)	(−3.26)	(1.711)	
Model:13	−0.17	0.33	−0.67	0.573	0.012	−0.691	−2.115	−1.701	2.774	5.27
Malaysia	(−0.44)	(2.1)	(−0.88)	(0.314)	(0.04)	(−0.1)	(−0.72)	(−1.66)	(1.33)	

Model										
Model:14 Kazakhstan	−0.18 (−0.8)	3.55 (3.1)	−0.25 (−0.13)	1.166 (0.70)	0.418 (0.20)	0.422 (0.52)	5.029 (0.680)	−0.296 (−0.25)		5.42
Model:15 Lebanon	0.254 (1.46)	−0.86 (−1.1)	0.84 (0.72)	−0.322 (−0.39)	0.970 (1.05)	−5.956 (−1.1)	0.588 (0.204)	16.98 (0.678)	2.56 (1.63)	0.68
Model:16 Oman	−0.20 (−1.14)	0.69 (1.3)	0.64 (1.02)	−0.652 (−0.49)	0.255 (0.29)	−3.96 (−0.9)	4.115 (1.14)	16.77 (0.231)	−0.30 (−0.37)	2.39
Model:17 S. Arabia	0.001 (0.07)	0.16 (1.3)	−0.06 (−0.7)	−0.004 (0.020)	0.083 (0.40)	0.208 (0.24)	−0.188 (−0.406)			1.57
Model: 18 Bahrain	0.03 (0.29)	0.157 (0.90)	−2.3 (−1.02)	−0.435 (−1.23)	0.115 (0.43)	−6.052 (−1.7)	5.457 (1.50)		1.054 (1.45)	0.57
Modle:19 S. Korea	0.12 (0.24)	−0.61 (−1.3)	0.27 (1.58)	1.39 (0.748)	−0.43 (−0.5)	7.772 (0.93)	−0.553 (−0.085)	2.355 (1.215)	7.952 (2.250)	4.06
Model:20 Kuwait	0.05 (0.6)	0.219 (1.37)	−0.13 (−0.6)	0.512 (0.894)	−2.22 (−1.9)	−1.401 (−0.3)	−0.004 (−0.003)	−0.397 (−0.112)	−0.551 (−0.86)	1.02
Model:21 Japan	0.39 (1.6)	−0.47 (−1.5)	0.003 (0.02)	−0.139 (−0.29)	−0.93 (−0.7)	4.890 (0.58)	−5.611 (−1.63)	0.125 (0.165)	−3.809 (−0.37)	1.31
Model:22 UAE	−0.04 (−0.40)	1.47 (3.3)	−1.05 (−2.1)	−1.59 (−1.17)	0.388 (1.22)	0.058 (1.36)	−2.158 (−0.63)		−3.47 (−0.72)	5.46
Model:23 Israel	0.24 (1.1)	−0.5 (−2.1)	0.69 (1.5)	3.22 (2.782)	0.316 (0.30)	8.66 (2.91)	−2.34 (−0.64)	−0.701 (−0.57)	−3.623 (−1.33)	2.98
Model:24 Singapore	0.28 (0.57)	−0.19 (−1.2)	0.42 (0.78)	−0.34 (−0.68)	0.718 (2.54)	−0.73 (0.15)	−4.13 (−1.69)	1.33 (0.568)	4.56 (1.476)	2.10
Model: 25 Qatar	−0.002 (−0.10)	0.082 (1.33)	−0.31 (−1.9)	0.095 (0.387)	0.203 (0.61)	−0.761 (−1.4)	−0.008 (−0.029)		−0.247 (−1.07)	1.82
Model: 26 Overall	0.22 (3.1)	−0.001 (−1.6)	0.001 (1.6)	0.2458 (2.978)	0.005 (0.16)	−0.176 (−0.7)	−0.851 (−1.512)	0.4028 (4.519)	−0.54 (−1.84)	2.52

The relationship between stock return and size has observed significant and positive in the context of India, Kazakhstan, UAE, and Malaysia. This implies that the size can truly explain the relationship with stock return. There has been a positive relationship this indicated that, if the size of the stock market increased that would increase in stock return. From this evidence, it can be concluded that in the context of India, Malaysia, Kazakhstan, and UAE the investors feel secured to invest in the large firm and there has been a positive relationship. Whereas, in the context of Iran, Jordan, Thailand, and Israel there has been observed significant and negative relationships. This implies that the size can truly explain the relationship with stock return.

The relationship between stock return and stock traded turnover ratio has been observed as significant and positive in the context of Vietnam, Thailand, and China. This implies that the investors of Vietnam, Thailand, and China want to invest in the highly traded stock rather than less traded stock, whereas in the context of UAE it has been observed as significant and negative relationships. This implies that the investors of UAE want to earn more investing in the less traded stock. Out of 25 countries only four countries have been found significant; except this it has been observed insignificant.

The relationship between stock return and money supply has been found significant in the context of Sri Lank, China, and Israel. Sir Lanka has been found negative but in the context of China and Israel it is found a positive relationship. This implies that in the context of Sri Lank increase in money supply decreases the stock return and vice-versa. The reason could be in Singapore the foreign direct investment has observed very high in comparison to other countries. Trade openness is the proportion between import and export over gross domestic product. The foreign direct investment affects export and import and that affects trade openness. High FDI results in high trade openness and high circulation of money in the market. High money circulation increases the demand for the stock and that resulted in more return. Regarding the relationship between stock return and GDP growth rate, it has been found a significant and positive relationship in the context of Vietnam and Israel and a significant but negative relationship in the context of Sri Lank. Similarly, the relationship between stock return and the inflation rate has been found insignificant in all the countries. This implies that the inflation rate cannot explain the relationship of stock return. The relationship between stock return and the exchange rate has been found significant in the context of Iran and China. There has been a positive relationship between stock return and exchange rate in the context of Iran but negative in the context of China. Regarding the relationship between stock return and the real interest rate has been found significant in the context of Bangladesh, Thailand and South Korea. The relationship between stock return and real interest rate in the context of Bangladesh and Thailand has been observed as negative, but positive in the context of South Korea. The evidence showed that stock market-specific variables are more important rather than macro-economic variables. The size is more important than the stock traded turnover ratio. In the case of macro-economic-variables GDP growth rate and money supply have been found equally important followed by the exchange rate, real interest rate, and trade openness. The inflation rate has been found a less important variable to explain the relationship with stock return.

Table-5: Test of panel unit roots test results

Variables	Probability	First difference
Stock return	0.0000	(-18.6324)
Size	0.0000	(-6.15142)
Stock traded turnover ratio	0.0000	(-5.21505)
Stock return	0.0000	(-7.22527)
Money supply	0.0000	(-5.98499)
Interest rate	0.0000	(-7.12076)
Trade openness	0.0000	(-8.20451)
Inflation rate	0.0000	(-9.56923)
GDP-GR	0.0000	(-10.0120)
Exchange rate	0.0000	(-4.82622)

The results from the panel unit root test at first difference have been presented on the above table. It has been assumed that the variables at first difference are stationary. The variables; stock return, size, and stock traded turnover ratio has shown significant in all the cases. So, it can be inferred that the data are stationary. The null hypothesis is there is unit-root, or the data are non-stationary. The hypothesis of unit-root has been rejected at five percent of the significance level. This implies that the series has been well characterized as an I (1) matrix process. These results allow testing for co-integration among the variables.

Table-6: Cointegration Results

Panel statics	Size	STTR	MS	TO	GDPGR	INF	ER	RIR

Panel v-Statistic	-0.99	-0.41	-0.1582	0.2760	-0.779	-0.2206	1.446741	-0.5443
Panel rho-Statistic	-3.99	-4.61	-5.6338	-6.0205	-5.34	-5.8568	-6.5236	-5.2476
Panel PP-Statistic	-6.77	-9.47	-10.443	-9.2866	-9.1135	-8.0517	-9.7520	-7.5272
Panel ADF-Statistic	-7.09	-8.51	-8.8923	-8.3851	-8.0685	-7.3491	-8.7387	-7.0398
Group statics								
Group rho-Statistic	-1.68	-1.95	-3.4504	-3.8336	-3.4701	-3.3771	-4.0430	-2.4839
Group PP-Statistic	-7.45	-12.3	-14.325	-11.195	-10.903	-10.249	-11.523	-11.453
Group ADF-Statistic	-6.69	-8.39	-9.0461	-9.1122	-8.8180	-8.1678	-9.2709	-7.7233

The interesting fact has noticed here is that in the earlier part the regression relationship has been examined. The result showed that the variation in the relationship as per the different situations and contexts. That has verified through testing at different conditions and different countries but from the same data, the strong long-term relationship has been found between and among the variables. What could be the reasons? To answer this question let's discuss the trade cycle. In the long run, the trade follows the path of growing at the beginning, then to the boom, after its climax, its declines, and recession. Then it catches the path of recovery, grows, bloom, decline, recession, and recovery, in a continuous process. Do all the business organizations follow the same process of the business cycle?

Table-7: Causality Results

	Statistical Values		Causality
All countries	Prob.	F-value	
Size $\rightarrow$ SR	0.0006	(7.65940)	Causality
SR $\rightarrow$ Size	0.0002	(8.73761)	Causality
STTR $\rightarrow$ SR	0.0341	(3.41274)	Causality
SR $\rightarrow$ STTR	0.0083	(4.86616)	Causality
MS $\rightarrow$ SR	0.6901	(0.37134)	No causality
SR $\rightarrow$ MS	0.5947	(0.52046)	No causality
TO $\rightarrow$ SR	0.7874	(0.23917)	No causality
SR $\rightarrow$ TO	0.9850	(0.01516)	No causality
GDP-GR $\rightarrow$ SR	0.003	(10.6347)	Causality
SR $\rightarrow$ GDP-GR	0.00009	(30.1128)	Causality
INF. R$\rightarrow$ SR	0.8576	(0.15365)	No causality
SR $\rightarrow$ INF. R	0.6615	(0.41381)	No causality
ER $\rightarrow$ SR	0.6454	(0.43841)	No causality
SR $\rightarrow$ ER	0.7404	(0.30082)	No causality
RIR $\rightarrow$SR	0.9893	(0.01078)	No causality

SR → RIR	0.4233	(0.86227)	No causality

The null hypothesis is no causality. The rejection of the null hypothesis denotes there has been causality relation between variables. Regarding the causal relationship between stock return and size, STTR and GDPGR have found significant. The null hypothesis has been rejected but in other cases, it has not been rejected. This implies that the money size, STTR and GDPGR can predict the changes in stock return. The results showed that the regression and causal relationship have been found changing but results of co-integration have been consistent. This evidence further supported the ideology that the relationship between stock return and fundamental variables has been changed in different contexts and situations. Similarly, the fundamental variables explain and predict the changes in stock return in the long run but in the short run, it may not be truly applicable to all stock markets. The reason behind that could be missing of psychological and behavioral aspects. The study incorporating behavioral aspects in the financial model could be a future avenue for the upcoming researchers.

Concluding remarks

This study could be a special piece of work for investors. Because, the stock market could be a platform in which the person who has the interest of doing investment, but time limits may be an obstacle. Nowadays, the information on the stock market and the individual company, and of course, the technology has assisted greatly in the phenomena. The idea of conducting this study has been grown up from the same ground. The study has put forward the important messages to the investors; the relationship between and fundamental variables could be compatible in the long run but in the short run, it is contextual (varied as per the situations). Thus, until and unless the contextual variables and psychological aspect incorporated the result from traditional financial theories may not truly explain the relationship between stock return and fundamental variables. Finally, it can be concluded that the relationship between stock return and fundamental variables can be generalized in the context of the long run. But in the context of the short run, it is better not to generalize. This could hold better explaining and predicting power after incorporation of the psychological aspect.

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