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Causal Relationship between Aggregate Economic Variables and Stock Market (Evidence from Pakistan)

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Abstract

Over the past few decades economists are trying to explore the effect of aggregate economic variables on capital market. Literature disclosed relationship between capital market and state variables; however the direction of causality still remains unsolved. This paper investigates the causal relationship between aggregate economic variables (gross domestic product, industrial production index, exchange rate, inflation and unemployment rate) and stock market, using quarterly data from 1992 to 2010. Granger causality test is applied to check the causality between the variables. Results indicate that there is bidirectional causality between stock market and three aggregate variables including GDP, IPI and Exchange rate. While unidirectional causality found between capital market and two macro variables i.e. Inflation and Unemployment, the direction of causality flows from aggregate variables to capital market. This study will facilitate the investors in taking effective investment decision by analyzing the macroeconomic factors, and estimating the direction of equity prices to allocate their resources effectively.

Keywords: Aggregate economic variables; Industrial production index; Gross domestic product

Introduction

The primary role of Capital Market is to mobilize long term savings and channeling them into productive investment. Capital market got importance when it comes to the study of the developing economies; they are the barometer of the developing economy [1]. Factors that affect equity market are of great importance for investors [2]. Stock prices are modeled to be linear function of various macroeconomic variables [3].

There are some risks associated with the state variables that describe the economy which are rewarded in the stock market [4]. Gan, et al. [5] argued that the stock market of comparatively small developed countries is also sensitive to change in macroeconomic variables. Inflation and interest rate is the best predictor of stock returns of developed countries [6].

Efficient market hypothesis states that stock market prices always reflect the fundamental macroeconomic indicators [7]. Policy makers should take this in account that the aggregate real economy of the developed countries is cointegrated with the stock market [8]. Some macroeconomic variables lead stock returns, while others are led by them in developed countries but there is no causal relationship between macroeconomic variables and stock market in less developed countries [9].

After 1991 post liberalization period in Pakistan, a strong association came in existence between stock prices and macroeconomic variables, which depicts that Pakistan stock market is sensitive to changes in the aggregate economic variables [10]. It became a level of attention for researcher to check the relationship between economic variables and stock prices after economic reforms in Pakistan. Sohail and Hussain [11] added that stock market returns can be increased if there is stabilization policy i.e. control of inflation and increase in industrial production. Different aggregate economic variables i.e. GDP, Inflation, exchange rate cause almost 80% of movements in the stock price at Karachi stock exchange [12]. Monetary policy factors and supply factors influence the stock market activities in emerging stock market [13] while there is existence of two way interaction between stock market and macroeconomic variables of emerging market [14].

Not macroeconomic variables influence the stock market rather investor can predict the behavior of macroeconomic variables by using information of stock market [15]. Stock market is leading indicator for future growth in exchange rate, gold prices, money supply and industrial production because there exists a unidirectional causality from stock prices to aggregate demand [16].

After economic reforms emerging stock markets started to play their role, the knowledge of cause and effect relationship got importance after that. Husain and Mahmood [17] extensively studied this relationship and concluded that Pakistan stock market is not developed enough to influence the economic policies and affect the aggregate demand, rather there is one way causation from aggregate demand towards stock market. Nishat and Shaheen [18] re-examined this relationship and found that there is a strong association between stock price and macroeconomic variables and two way causal relationship exists between stock market and macroeconomic variables. The equity market of Pakistan doesn't represent the macroeconomic movements in country and fundamental news cannot be used to predict the stock market and vice versa [19].

Numerous empirical studies have investigated the predictability of stock returns using different macroeconomic variables, and direction of causality between stock prices and real variables is not conclusive. But limited studies investigate about the causal relationship between stock market and aggregate economic variables by incorporating employment rate as the macroeconomic factor. The aim of this paper is to check the causal relationship between aggregate economic variables including employment rate, foreign exchange rate, GDP, inflation and Industrial Production. With reference to Pakistan there is limited

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work on relationship of employment and stock market. Atesoglu [20] concluded that there is a positive relationship between stock prices and employment, increase in stock prices leads to employment rate. The aim of this paper is to check that either stock market leads aggregate economic variables or vice versa. This work will be helpful for policy makers for future decision making.

Literature Review

Impact of state variables on capital markets especially in emerging markets always remain focused area for researchers and it got importance in last few decades after financial liberalization and different economic shocks including Asian crisis, Global financial crisis etc. Several researchers investigated that either macroeconomic factors influence the stock market or vice versa during different time periods but empirical results are not conclusive. The relation of said variables are well analyzed for developed economies by Chen, Roll and Ross.

Maghayereh [21] studied the impact of set of macroeconomic variables (Inflation, Exchange rate, Industrial production, and Interest rate etc.) on developing capital market and found that macroeconomic variables are significant in predicting the changes in stock prices. Bilson, et al. [22] studied the same relationship for the emerging markets and concluded strong association of equity markets with macro factors. Empirical studies showed that the performance of stock exchange in emerging market is the good leading indicator for future macroeconomic conditions. Tangjitprom [23] proved this phenomenon in his study. Mahmood and Dinniah [24] studied this relationship for six Asia pacific countries and found that there is short term relationship between economic factors and capital markets. Empirical evidences showed that investor can get excessive return by analyzing the macroeconomic factors, which contradicts the hypothesis of Fama.

With reference to South Asian economies and especially for Pakistan different empirical studies conducted before and after financial liberalization to know the association between stock market and macroeconomic variables. Ahmed [25] studied the relationship of aggregate economic variables and stock market for India and found that stock market in India leads the economic activity. Ihsan et al. [26] studied the same impact for Pakistan the stock returns are influenced by set of financial and economic indicators including Industrial production, WPI, GDP, EX rate etc.

Hypothesis 1: Exchange Rate is Significantly Associated with Stock Market

Stock market and exchange rate

Exchange rate is the charging of one currency with another currency is known as exchange rate. Literature reveals that researchers prefer to use value of dollars in home currency as proxy for exchange rate. Dollars currency is used so often because of international trading currency. Literature emphasized on three main concepts regarding the relationship between exchange rate and stock market. Branson [27] presented the concept of portfolio balance approach first time. They found that stock prices cause a change in exchange rate. While Dornbusch and Fisher [28] presented a concept opposite to portfolio balance that is flow oriented model. They found that exchange rate movements cause the movements in stock prices. Third concept is strong feedback response which reveals that there is two way causality between stock prices and exchange rate, one can predict stock market performance through exchange rate movements and vice versa.

Several researches investigated relationship between stock returns and exchange rate. Frank and Young [29] pioneered to find the relationship between the said variables. They found no significant relationship in between them. Due to globalization investors prefer to invest in that region where there is stability in economy, which ultimately provide them better return. Vardar, et al. [30] found that depreciation in currency negatively affects the stock prices because of decrease in net worth of the investment of foreign investors. Developed countries formulate such policies which flourish and open their economy, maximize the wealth of nation and prioritized the welfare of their nation. Staverick [31] studied the impact of exchange rate on stock market for a set of developed and developing European countries. He found that there is strong causal relation between the two variables in developed countries because of stabilization policy but there is no causal relationship found for developing countries. It is seen that portfolio balance approach prevailed in developed countries.

With reference to Asian economies different results became part of literature, Ayedemir and Demirhan [32] analyzed seven years data of stock prices and exchange rate for Turkey by employing Granger non causality test proposed by Toda and Yamamoto [33] and found that there is negative causal relationship between the two variables. While Bhattacharya and Mukherjee [34] used same Granger non causality test found no causal linkage between stock prices and exchange rate with reference to India. Rahman and Din [35] tried to explore the relationship between two important components of economy (stock market and exchange rate) for three south Asian countries including Pakistan. They found that there is no long term association between these two components; investor cannot predict the performance of one component on the basis of past performance of other. In other words they rejected the causal relationship between stock prices and exchange rate. Li and Haung [36] studies these variables in China found that exchange rate granger because stock returns in short run, while there is no long term relationship between exchange rate and stock returns. Sundaram [37] re-examined the Indian stock market relation with exchange rate and found that there is no significant short term or long term relationship between these two variables and one cannot predict other by looking at one.

Most of the researchers employed co-integration and Engle-Granger causality test to check the long term and short term association of major variables under study. Bahmani-oskooee and Sohrabian [38] first time analyzed the causal relationship of exchange rate and stock prices. They found that in short run there is bi-directional causation between two variables while there is no significant relation in long run. Saini, et al. [39] also revealed the same results.

Mookerjee and Yo [40] used the techniques of cointegration and causality to check the relationship between set of macroeconomic variables and stock prices. They found no long term relationship between exchange rate and stock prices with any of the method. Shew [41] checked the causal relationship between exchange rate and stock market returns in Singapore for sixteen years' time period. There exists causal relationship between two variables, but direction of causality is different in pre and post Asian crisis time period. Investors react on the news which directly or indirectly impacts their expected returns. Homma, et al. [42] confirmed this investor behavior in Japan. They found that exchange rate negatively affect the stock returns, because those companies whose transactions are related in foreign exchange affected by appreciation and depreciation of the currency, so the

investors respond accordingly.

After Asian crisis, several researchers contributed to establish a relationship between macroeconomic variables and capital markets. Investor used to forecast the performance of one market on the basis of other. The relationship is extensively researched in emerging markets especially for Pakistan and the results are in aligning with the developed markets. Ibrahim and Yousaf [43] studied this impact in Malaysian market. They checked the impact of different macroeconomic variables (real activity, exchange rate and money supply) on stock market and found negative association of exchange rate with stock market performance. Abdullah and Murinde [44] checked this relationship on set of four emerging markets including Pakistan. They found uni-directional causality from exchange rate to stock market and argued that government should be cautious while implementing exchange rate policies because such policies may have adverse repercussions on their domestic equity markets.

Hypothesis 2: Inflation is Negatively Associated with Stock Market

Stock market and inflation

Inflation means decrease in purchasing power and real value of money. When general price level increases the consumption of goods and services decrease. It is commonly measured through percentage change in price index over time. Researchers mainly used Consumer price index or Wholesale index as proxy to measure Inflation. Fama [45] extensively worked on relationship of expected inflation and stock returns, he found negative relationship between stock returns and inflation. He postulates proxy hypothesis which states that stock returns and inflation are strongly related with real activity of country so if there is negative relationship between inflation and real activity than it will create negative relationship between stock returns and inflation. Adrangi, et al. [46] rejected the proxy effect when they found that there is a negative relationship between inflation and stock return even the negative effect of inflation and real economy is purged. Sari and Soytas [47] re-examined the relation between inflation and stock returns while controlling the relation between real activity and inflation for Turkey, found the same results. According to hypothesis of Fisher nominal stock return is sum of real return and expected inflation and nominal return on stocks increase as the inflation increases, In other words investor is compensated because of increase in rate of inflation. Different studies including Nelson [48] and Gultekin [49] studies rejected this hypothesis and found that when inflation increases the return on stocks decreases.

Emerging markets are those markets which incorporate economic information in its performance and respond to expected news according to efficient market hypothesis. Different researchers establish a relationship between inflation and stock market for developed countries. To check this relationship for emerging markets Schwert [50], Adams, et al. [51] extensively studied the markets and its linkage with different macroeconomic factors. Empirical results showed that in emerging markets stock markets respond abruptly on the news of inflation. An increase in general level price decreases the stock prices. Fama and Shwert [50] exerted their effort to know that either the stock returns be used as hedge against expected and unexpected inflation, because of Fisher hypothesis. Their results showed that stock returns are negatively associated with inflation and it can't be used as hedge for expected inflation. This relationship is thoroughly studied for developing economies also. Al-Sharkas [52] used Vector error correction model to check the impact of inflation on stock market and found that there is long term relationship between inflation and stock market, but this relation appeared as negative. His findings are consistent with the findings of different researchers for developed economies like Mukherjee and Nakka [53], Chen, Roll and Ross [4].

Several efforts have done by different researchers to explore the causal (long term and short term) relation between inflation and stock returns. Crosby and Otto [54] extensively worked to explore this relationship in thirty four countries and found that there is no granger causality in majority of countries. While few countries showed long-term positive relationship between the variables under study which confirms the findings of Abdullah, Hayworth. Coleman and Tetty [44,55] used quarterly data for 15 years and employed co-integration techniques to check the short and long run relation of stock market and inflation. Results showed that inflation adversely affect the stock market with a difference of lag period. Saryal [56] analyzed the relation of variables under study for Canada and Turkey for two decades through GARCH model, She found that rate of inflation can be used as predictor of stock market performance.

Gunsel and Cukur [57] analyzed this relationship on 350 companies listed on London stock exchange. They used monthly data from 1980 to 1993 for a set of macroeconomic variables and stock returns to explore co-integration between them. Results showed that there is no significant relationship between inflation and Stock returns because of efficient market hypothesis, which states that market predicts information before its announcement and incorporate that in it [45].

Hypothesis 3: GDP is Positively Associated with Stock Market

Stock price and GDP

Gross domestic product is the main indicator used to gauge the health of the country's economy. In developed countries, implementation of stabilized government policies makes the economy healthy. Different researchers at different time of periods worked to establish relation between GDP and stock market. GDP and stock market move together overtime for developed countries. Duca [58] confirmed this movement in his study. He studied relation between top ten biggest stock market in world with their GDP. He explored that Stock market Granger cause the GDP of the developed country. Sawhney, et al. [59] checked this relationship in two developed economies i.e. Canada and USA. Johnsen co-integration and VECM was used to ascertain long run and short run relationship between the variables under study. They found that there is strong long run as well as short run relationship between GDP and stock price while GDP granger cause the stock prices only. Wang [60] checked this relationship in china and explored that Chinas stock market is not efficient enough like developed markets, so there is no long term relationship between stock prices and real GDP. Acikalin, et al. [61] employed co-integration test and vector correction model to check the causality between set of macroeconomic variables including GDP and stock price index. They found long term relation and uni directional causality from GDP to stock price index.

With reference to South Asian economies, Cagli, et al. [62] explored the relationship between set of macroeconomic variables and stock price index during the period of structural breaks (Asian crisis, Global financial crisis etc.), they found that when there will be increase in GDP, the overall economy will grow and GDP is positively co-integrated with the stock market. With reference to Pakistan several studies contributed to add their findings in literature. Ihsan, et al. [26] explored that different set of economic and financial indicators affect

the performance of KSE index. GDP significantly affects stock returns in case of Pakistan. Shahbaz, et al. [63] explored this relationship by using Engle-Granger and ARDL methods. They found that there is bidirectional causality between economic growth and stock market while in short run uni-directional causality exists that flow from stock market to economic growth. It is extensively argued by different school of thoughts about the role of stock market in economy. One is with the opinion that stock market performance is associated with economic growth and the other stated that economic growth may be the catalyst for stock market growth. Mun, et al. [64] tried to solve this issue for emerging markets and concluded that stock market Granger causes the economic growth. Government should promote the stock market to have growth in the real economy. Based on the literature it is obvious that there is strong positive relationship between GDP and stock market but the direction of causality is not conclusive in all studies.

Hypothesis 4: IPI is Significantly Associated with Stock Market

Stock price and industrial production

Industrial production presents a measure of overall economy. In literature IPI (Industrial production index) is used as a proxy to check its relation with equity market. IPI is the indicator measure of the amount of output from major industries. Chen, et al. [65] found significant positive relationship between stock prices and industrial production for Taiwan which confirmed the findings of Maghayereh [21]. Kandir [66] found no long run association between these variables for Turkey. Karamustafa and Kucukkale [67] checked the causality between aggregate variables (including Industrial production) and stock returns. They used JJ co-integration and Granger causality test to identify the long run relationship. Results revealed that there exists a long term relationship between the variables under study while causality runs from stock return to Industrial production.

Chen, et al. [68] investigated the non-linear relationship between stock returns and industrial production by employing threshold autoregressive method (TVAR). They checked this relationship on four developing Asian countries. They divided the data into two segments the low return time period and the other one high and check their relationship with output growth, They found that the more developing one countries like japan and Korea regardless of return regimes, stock returns are the leading indicator for output growth while in less developing countries like Taiwan and Malaysia two patterns are common, that is; in period of low returns, stock market leads the output growth while in period of high returns there is no correlation between stock returns and industrial production.

With reference to Pakistan, Hassan and Nasir [69] employed bounds testing procedure for analyzing relationship between stock returns and macroeconomic factors. They used data from 1998 to 2008 and concluded that in Pakistan there is no significant relationship between Industrial production and stock returns in short run but they are associated in long run. Singh [70] explored the relationship between industrial production and stock market for India. He applied Granger causality test and found that stock market performance can be predicted through industrial production and vice versa. In other words there is bilateral causation between stock market and industrial production. Hussainey and Njoc [71] first time analyzed this relationship for Vietnamese stock market and found that there exists a positive relationship between stock market and industrial production. Maysami, et al. [72] studied this relationship for Singapore and found that the same result. Mehrara [73] analyzed that either a stock exchange be act as a barometer for country economy. He studied Iranian stock market and concluded that Iranian stock market is informational inefficient because stock market is not a leading indicator of economic growth rather change in macroeconomic factors majorly industrial production can cause change in stock prices. It means macroeconomic factors including industrial production granger cause stock market but not vice versa.

It can be hypothesized from the discussion that there is significant relationship between stock market and industrial production, regardless of their causal relation.

Hypothesis 5: Unemployment is Significantly Associated with Stock Market

Stock price and unemployment

According to Singh, et al. [74] Employment rate is the percentage of employed workforce which shows a country's ability to put its population to work and generate income from them. Unemployment rate is opposite of employment rate. Countries with high level of employment likely have higher living standards. Theory suggests that increase in employment increase in economic growth and so the returns in capital market. But there is limited work on the relationship of these variables. Economists tried to explore macroeconomic factors influence on capital markets with a lot of macro variables but not employment rate so often. Tursoy, et al. [75] argued that besides other macroeconomic factors Unemployment should be consider checking its impact on capital markets. They checked impact of different macro factors on equity returns including unemployment rate and found that there is no long term relationship between stock market and macro factors. Flannery and Protopapadakis [76] examined the relationship between stock returns and set of seventeen macro variables including employment news. GARCH model was used to find the empirical results. They concluded that there are seven macro factors that strongly affect the stock market and one of them is employment.

Hardouvelis [77] analyzed the response of different macroeconomic news on stock prices. He found that the response of unemployment news is significantly strongly than other variables with the stock prices. Pearce and Roley [78] also found no significant relation between unemployment news and stock market. Pilinkus and Boguslauskas [79] checked the relationship between stock returns and unemployment rate with other variables. Impulse response econometric technique was employed to check the short term relationship. Results revealed that unemployment significantly impact stock market in negative direction.

Research Methodology

This study explores the causal relationship between aggregate economic variables and Pakistan stock market for the period 1992 to 2010 by using quarterly data. In Pakistan financial liberalization was started in 1991, and according to different researches it is explored that macro factors influence capital markets after liberalization, that's why I used data from 1992. The variables of interest in this study includes KSE 100 index, Industrial production index, Gross domestic product, Inflation, Unemployment rate and Exchange rate. All data sets are extracted from International Financial Statistics (IFS), World Bank data, UN data sources and Federal Bureau of Statistics Pakistan.

To examine the relationship between aggregate economic variables and stock market return, following model has been tested;

$$\ln K_t=\beta_0+\beta_1\ln(GDP_t)+\beta_2\ln(IPI_t)+\beta_3(\ln Ex_t)+\beta_4\ln(Inf_t)+\beta_5\ln(UNE_t)+\mu$$

Where

K=KSE-100 Index

GDP=Gross domestic product

IPI=Industrial production index

Ex=Exchange rate

Inf=Inflation rate

UNE=Unemployment rate.

Different techniques are available to test the causal relationship among the time series variables. The procedure for testing causality between aggregate variables and stock market is "Granger Causality" proposed by C.J Granger in 1969. According to Hill, Griffiths and Judge majority of financial variables, monetary variables and macroeconomic variables are non-stationary. So first to identify that either the variables are stationary or non-stationary I used Augmented Dicky Fuller test.

Empirical Results and Discussion

Table 1 shows the general descriptive stats of the data. Tables 2a and 2b shows the regression result of all the variables. It is evident that all macroeconomic variables are significantly related with Pakistan stock market except GDP.

Variables	Mean	Standard Deviation
KSE	0.0264	0.146
IPI	4.2614	0.346
ExRate	3.9099	0.351
GDP	25.1533	0.418
UNE	7.2458	2.794
Inf	8.9409	4.475

Table 1: General descriptive stats of the data.

R square	Adj R square
0.775	0.612

Table 2a: Regression result.

	beta	Std. Error	t stat
IPI	0.973	0.303	1.903
GDP	0.012	0.336	-0.948
Ex.Rate	-0.200	0.148	-2.135
Inf	-0.272	0.007	-2.362
UNE	-0.299	0.011	1.910

Table 2b: Regression result of all the variables.

Variables	ADF at Level	ADF first Difference
Ln KSE 100	-6.665*	-8.321
Ln GDP	1.947	-4.282**
Ln ExRate	-1.563	-7.395**
Ln Une	-1.249	-3.528**
Inf	-1.252	-3.829**
IPI	-1.197	-3.480**
Critical values at		
1%		-4.085
5%		-3.470
10%		-3.162

*Stationary at level.

**Stationary at first difference.

Table 3: Result of unit root test.

Table 3 depicts the result of unit root test, applied to determine the order of integration among time series data. Augmented Dicky fuller test is used at level and at first difference under assumption of constant and trend.

Results clearly indicate that all variables are non-stationary at level except KSE-100 index, because its T-value is greater than Critical values. All other variables are non-stationary at level as the t-value is less than the critical values. All series are stationary at first difference, so it is said that the series is integrated at I (1). To integrate all the series in order 1, first deference of all the variables are taken [80,81]. After making the series stationary I applied Engle Granger causality test proposed by C.J Granger in 1969.

The Granger-Causality test is conducted to study the relationship between aggregate economic variables and Pakistan Capital market. Table 4 reported pairwise Granger causality test results with lags 2, as lag 2 is an appropriate lag order chooses in terms of Akaike information criteria (AIC) and Schwarz info criterion (SIC). Table shows three significance level 1%, 5% and 10%. Bidirectional causality is found in between GDP and KSE, IPI and KSE, and exchange rate and KSE and these relationships are significant at 5%. While unidirectional causality is found in case of Unemployment and KSE and Inflation and KSE. It is clear evident from the result that GDP, IPI and exchange rate influence the stock market of Pakistan and any variation in stock market also influences the said variables. In case of Unemployment and Inflation unidirectional causality found which effects negatively on stock market while stock market variation did not affect these variables.

Bidirectional causality is found in case of GDP. While the directional of causality from GDP to KSE is significant at 10%, on the other side the directional causality from KSE to GDP is significant at 5%. When capital market performs well than it will leads the economy towards betterment, which ultimately leads towards entrance of new firms in the business to earn profit. Thus scenario will increase the efficient use of resources and the overall domestic production keep on increasing. On the other side when industrial production pattern is seen, it shows that IPI leads to capital market and it is significant at 5% level and null hypothesis can be rejected that IPI does not granger cause KSE-100. Industrial production index shows all the manufacturing sector performance, so if the performance of all manufacturing industry will improve the profitability of the sector improves which ultimately increase their stock prices and affect the index of capital market. On the other hand the directional causality from KSE to IPI is significant at 10% level. There is also existence of bidirectional causality between exchange rate and capital market of Pakistan. Exchange rate defines as

Null Hypothesis	F-Statistic	Probability
GDP does not Granger Cause KSE_100	2.3345***	0.0716
KSE_100 does not Granger Cause GDP	3.58720*	0.0330
Inflation does not Granger Cause KSE_100	3.6808*	0.0303
KSE_100 does not Granger Cause Inflation	0.4871	0.6165
IPI does not Granger Cause KSE_100	3.2889**	0.0416
KSE_100 does not Granger Cause IPI	2.48643***	0.0906
EX.Rate does not Granger Cause KSE_100	3.7007**	0.0279
KSE_100 does not Granger Cause EX.Rate	2.47802***	0.06220
KSE_100 does not Granger Cause Unemployment	0.8334	0.4389
Unemployment does not Granger Cause KSE_100	2.5915**	0.04989

*Null Hypothesis rejected at 1% significance level.

**Null hypothesis rejected at 5% significance level.

***Null hypothesis rejected at 10% significance level.

Table 4: Granger causality test results.

value of foreign currency in terms of local currency. The hypothesis accepted that foreign exchange rate negatively affect the stock market and vice versa. Sixty percent investment in Pakistan capital market is comprises of foreign investors, so a decrease in value of local currency affect the sentiment of investor and they start withdrawing their investment, which negatively affect the stock market. On the other hand if due to less return than required by the investor, the investor withdrew their investment which will put pressure on the supply of foreign currency, which ultimately affect the exchange rate of the country.

It was hypothesized that inflation put negative impact on stock market, which is confirmed from the empirical results. When there is increase in inflation the investors relatively become poor and its required rate of return changes according to fisher theory. According to this theory when required return changes than supply and demand gap in stock market increases which put downward pressure on capital market. Results showed that there is significant impact of inflation on KSE performance, but this impact is unidirectional.

Unidirectional causality found in case of unemployment and stock market, which states that unemployment, leads stock market negatively but there is no causality from stock market to unemployment. When unemployment in an economy increases the savings pattern disturbs. And due to lack of savings and increased consumptions the economy worked at less efficient level. When unemployment goes up there remain less people for paying tax and due to less income government cutback budget of different sectors. This ultimately decreases the savings and increase the cost of production for different companies. This entire scenario will put negative impact on the stock market due to low investment and increased consumption.

Conclusion

This study explores the causal relationship among the industrial production index, gross domestic product, exchange rate, inflation, unemployment and stock market of Pakistan for the period 1992 to 2010 by using Granger causality test. Results revealed that bidirectional causality exists among industrial production index, exchange rate, gross domestic product and stock market. While unidirectional causality found in case of unemployment, inflation and stock market and the direction of causality is from macroeconomic variables to stock market.

Implications

This study will facilitate the investors in taking effective investment decision by analyzing the macroeconomic factors, and can estimate the direction of equity prices to allocate their resources effectively. Efficient market hypothesis states that capital market responds to arrival of new information, so macroeconomic policies should be designed keeping in view the response of capital markets.

Limitations and Future Directions

One of the limitations of the study is that I have used five aggregate economic variables only, so further research needs to be explored by including all macro variables like discount rate, oil prices, foreign reserves etc to know the overall impact of economic variables on the capital market. Secondly it is quite possible that aggregate economic variables have different impact on capital market volatility depending on trading mechanism and regulatory environments, so these external factors needs to be incorporated to know the overall behavior of capital market.

References

1. Sohail N, Hussain Z (2009) Long Run and Short Run relationship between macroeconomic variables and stock prices in Pakistan, the case of LSE. The Pakistan economic and social review 47: 183-198.
2. Hassan G, Al-refai H (2012) Can macroeconomic factors explain equity returns in long run? The case of Jordan. Applied Financial Economics 22: 1029-1041.
3. Ross SA (1976) The arbitrage theory of capital asset pricing. Journal of Economic Theory 13: 341-360.
4. Chen N, Roll R, Ross RS (1986) Economic Forces and stock market. Journal of Business 59: 383-403.
5. Gan C, Lee M, Yong HHA, Zhang J (2006) Macroeconomic variables and stock market interactions: Newzealand evidence. Investment Management and Financial Innovations 3: 89-101.
6. Rapach DE, Wohar ME, Rangvid J (2005) Macro Variables and International Stock Return Predictability. International Journal of Forecasting 21: 137-166.
7. Fama EF (1970) Efficient capital markets: A review of theory and empirical work. The Journal of Finance 25: 383-417.
8. Cheung Y, Ng LK (1998) International evidence on stock market and aggregate economic activity. Journal of Empirical Finance 5: 281-296.
9. Abu-Libdeh H, Harasheh M (2011) Testing for correlation and causality relationships between stock prices and macroeconomic variables the case of Palestine Securities Exchange. International Review of Business Research 7: 141-154.
10. Mohammad SD, Hussain A, Jalil MA, Ali A (2009) Impact of macroeconomic variables on stock prices: empirical evidence in case of KSE. European Journal of Scientific Research 38: 96-103.
11. Sohail N, Hussain Z (2011) The macroeconomic variables and stock returns in Pakistan, case of KSE 100 Index. International Journal of Finance and Economics 1: 76-84.
12. Ahmad Z, Ahmad Z, Khan MS, Javaid U (2012) Capturing the stock price movements in KSE: are economic variables relevant? African Journal of Business Management 6: 3026-3034.
13. Rahman AA, Sidek NZM, Tafri FH (2009) Macroeconomic determinants of Malaysian stock market. African Journal of Business Management 3: 095-106.
14. Muradoglu G, Taskin F, Bigan I (2000) Causality between stock returns and macroeconomic variables in emerging market. Russian and East European Finance & Trade 36: 33-53.
15. Farooq MT, Keung WW (2004) Linkage between Stock Market Prices and Exchange Rate: A Causality Analysis for Pakistan. The Pakistan Development Review 43: 639-649.
16. Buyuksalvarcy A (2010) The effects of macroeconomic variables on stock returns: Evidence from Turkey. European Journal of Social Science 14: 404.
17. Husain F, Mahmood T (2001) The stock market and economy in Pakistan. The Pakistan Development Review 40: 107-114.
18. Nishat M, Shaheen R (2004) Macroeconomic factors and pakistan equity market. The Pakistan development Review 43: 619-637.
19. Ali I, Rehman K, Yilmaz AK, Khan MA, Afzal H (2010) Causal relationship between macroeconomic indicators and stock exchange prices in Pakistan. African Journal of Business Management 4: 312-319.
20. Atesoglu HS (2002) Stock Prices and Employment. Journal of Post Keynesian Economics 24: 493-498.
21. Maghayereh A (2003) Causal relations among stock prices and Macroeconomic variables in the small, open economy of Jordan. JKAU: Econ and Admin 17: 3-12.
22. Bilson C, Brailsford T, Hooper V (1999) Selecting macroeconomic variables as explanatory factors of emerging stock market returns. Pacific Basin Journal 9: 401-426.
23. Tangjitprom N (2012) Macroeconomic factors of emerging stock market: The evidence from Thailand. International Journal of Financial Research 3: 105-114.
24. Mahmood WMW, Dinniah NM (2009) Stock returns and macroeconomic

variables: Evidence from the six Asian-pacific countries. International Research Journal of Finance and Economics 30: 154-164.

25. Ahmed S (2008) Agregate economic variables and stock market in India. International Research Journal of Finance and Economics 14: 141-164.
26. Ihsan H, Ahmad E, Haq MI, Sadia H (2007) Relationship of economic and financial variables with behavior of stock returns. Journal of Economic Cooperation 28: 1-24.
27. Branson WH (1977) Asset markets and relative prices in exchange rate determination. Princeton University Press.
28. Dornbusch R, Fischer S (1980) Exchange rates and current account. The American Economic Review 70: 960-971.
29. Franck P, Young A (1972) Stock prices reaction of multinational firms to exchange realignments. Financial Management 1: 66-73.
30. Vardar G, Aksoy G, Can E (2008) Effects of interest and exchange rate on volatility and return of sector price indices at Istanbul stock exchange. International Research Journal of Finance and Economics 11: 126-135.
31. Stavarek D (2005) Stock prices and exchange rates in EU and the USA: Evidence of their mutual interactions. Czech Journal of Economics and Finance 55: 141-161.
32. Aydemir O, Demirhan E (2009) The relationship between stock prices and exchange rates: Evidence from Turkey. International research journal of finance and economics 23: 207-215.
33. Toda HY, Yamamoto T (1995) Statistical inference in vector auto regressions with possibly integrated processes. Journal of Econometrics 66: 225-250.
34. Bhattacharya BB, Mukherjee J (2003) Causal relationship between stock market and exchange rate, foreign exchange reserves and value of trade balance: A case study for India. Presents at 5th annual conference on money and finance in Indian economy.
35. Rahman ML, Din J (2009) Dynamic relationship between stock prices and exchange rates: Evidence from three south Asian countries. International Business Research 2: 167-174.
36. Li Y, Huang L (2008) On the relationship between stock return and exchange rate: Evidence from China.
37. Sundaram K (2009) Investigating causal relationship between stock return with respect to exchange rate and FII: Evidence from India. MPRA paper no 15793.
38. Bahamani-oskooee M, Sohrabian A (1992) Stock prices and effective exchange rate of the dollar. Applied Economics 24: 459-464.
39. Saini WNWA, Habibullah MS, Azali M (2003) Stock price index and exchange rate interactions in an emerging market. International Review of Economics and Business 50: 503-519.
40. Mookerjee R, Yu Q (1997) Macroeconomic variables and stock prices in open economy: The case of Singapore. Pacific-Basin Finance Journal 5: 377-388.
41. Shew JA (2008) Causality relationship between foreign exchange rates and stock market close: Evidence in Singapore. Bryant Economic Research Paper 1.
42. Homma T, Tsutsui Y, Benzion U (2005) Exchange rate and stock prices in Japan. Applied Financial Economics 15: 469-478.
43. Ibrahim MH, Yusoff WSW (2001) Macroeconomic variables, exchange rate and stock price: A Malaysian perspective. International Journal of Economics and Management and Accounting 9: 141-163.
44. Abdullah DA, Hayworth SC (1993) Macro econometrics of stock price fluctuations. Quarterly journal of business and economics 32: 50-67.
45. Fama EF (1991) Efficient capital markets: II. The Journal of Finance 46: 1575-1617.
46. Adrangi B, Chatrath A, Sanvicente A (2000) Inflation, output and stock prices: Evidence from Brazil. The Journal of Applied Business Research 18: 61-77.
47. Sari R, Soytas U (2005) Inflation, stock returns and real activity in Turkey. The empirical economics letters 4: 181-192.
48. Nelson CR (1976) Inflation and rates of return on common stocks. The journal of finance 31: 471-483.
49. Gultekin NB (1983) Stock market returns and inflation: Evidence from other countries. The Journal of Finance 38: 49-65.
50. Fama EF, Schwert GW (1977) Asset returns and inflation. Journal of financial economics 5: 115-146.
51. Adams G, Macqueen G, Wood R (2004) The effects of inflation news on high frequency stock returns. Journal of Business 77: 547-574.
52. Al-sharkas A (2004) The dynamic relationship between macroeconomic factors and the Jordanian stock market. International Journal of Applied Econometrics and Quantitative Studies 1: 97-114.
53. Mukhurjee TK, Nakka A (1995) Dynamic relations between macroeconomic variables and the japenese stock market: An application of a vector error correction model. Journal of Finance Research 18: 223-237.
54. Crosby M, Otto G (2000) Inflation and the capital stock. Journal of Money, Credit and Banking 32: 236-253.
55. Coleman AK, Tetty KFA (2008) Impact of macroeconomic indicators on stock market performance: The case of the Ghana Stock Exchange. The Journal of Risk Finance 9: 365-378.
56. Saryal FS (2007) Does inflation have an impact on conditional stock market volatility? Evidence from Turkey and Canada. International Research Journal of Finance and Economics 11: 123-133.
57. Gunsel N, Cukur S (2007) The effects of macroeconomic factors on London stock returns: A sectoral approach. International Research Journal of Finance and Economics 10: 140-152.
58. Duca G (2007) The relationship between the stock market and the economy: Experience from international financial markets. Bank of Valletta review 36: 1-12.
59. Sawhney B, Anoruo E, Feridun M (2006) Long run relationship between economic growth and stock returns: An empirical investigation on Canada and united states. Journal of Economics 54: 584-596.
60. Wang X (2011) The relationship between stock market volatility and macroeconomic volatility: Evidence from China. Journal of Chinese Economics and Finance 2: 67-77.
61. Acikalin S, Aktas R, Unal S (2008) Relationships between stock markets and macroeconomic variables: An empirical analysis of the Istanbul stock exchange. Investment Management and Financial Innovations 5: 8-16.
62. Caglic EC, Halac U, Taskin D (2010) Testing long run relationship between stock market and macroeconomic variables in the presence of structural breaks: The Turkish case. International Research Journal of Finance and Economics 48: 49-60.
63. Shahbaz M, Ahmed N, Ali L (2008) Stock market development and economic growth: ARDL causality in Pakistan. International Research Journal of Finance and Economics 14: 182-195.
64. Mun HW, Siong EC, Thing TC (2008) Stock market and economic growth in Malaysia: Causality test. Asian Social Science Journal 4: 86-92.
65. Cheng MC, Tzeng ZC, Kang WL (2011) The impact of non-macroeconomic events on Taiwan electronic industry stock index returns. Global Economy and Finance Journal 4: 80-101.
66. Kandir SY (2008) Macroeconomic variables, firm characteristics and stock returns: Evidence from Turkey. International Research Journal of Finance and Economics 16: 35-45.
67. Karamustafa O, Kucukkale Y (2003) Long run relationships between stock market returns and macroeconomic performance: Evidence from Turkey. Journal of International Financial Markets 7: 32-47.
68. Chen PF, Lee CC, Wong SW (2006) Is rate of stock returns a leading indicator of output growth? In the case of four east Asian countries. Joint Conference on Information Sciences 1-5.
69. Hasan A, Nasir ZM (2008) Macroeconomic factors and equity prices: An empirical investigation by using ARDL approach. The Pakistan Development Review 47: 501-513.
70. Singh D (2010) Causal relationship between macreonomic variables and stock market: A case study for India. Pakistan Journal of Social Sciences 30: 263-274.
71. Hussainey K, Ngoc LK (2009) The impact of macroeconomic indicators or Vietnamese stock prices. Journal of Risk Finance 10: 321-332.
72. Maysami RC, Howe LC, Hamzah MA (2004) Relationship between macroeconomic variables and stock market indices: Co-integration evidence

from stock exchange of Singapore's All-S sector indices. Journal Pengurusan 24: 47-77.

73. Mahrara M (2006) The relationship between stock market and macroeconomic variables: A case study for Iran. Iranian Economic Review 10:137-148.

74. Singh T, Mehta M, Varsha MS (2011) Macroeconomic factors and stock returns: Evidence from Taiwan. Journal of Economics and International Finance 2: 217-227.

75. Tursoy T, Gunsel N, Rjoub H (2008) Macroeconomic factors, the APT and the Istanbul stock exchange. International Research Journal of Finance and Economics 22: 49-57.

76. Flannery MJ, Protopapadakis AA (2002) Macroeconomics factors do influence aggregate stock. Review of Financial Studies 15: 751-782.

77. Hardouvelis GA (1987) Macroeconomic information and stock prices. Journal of Economics and Business 39: 131-140.

78. Pearce DK, Roley VV (1985) Stock prices and economic news. The Journal of Business, University of Chicago 58: 49-67.

79. Pilinkus D, Boguslauskas V (2009) The short-run relationship between stock market prices and macroeconomic variables in Lithuania: An application of the impulse response function. Engineering Economics 5: 26-34.

80. Abdalla ISA, Murinde V (1997) Exchange rate and stock price interactions in emerging financial markets: Evidence on India, Korea. Pakistan and Philippines. Allied Financial Economics 7: 25-35.

81. Schwert GW (1981) The adjustment of stock prices to information about inflation. The Journal of Finance 36: 15-29.