Interplay between Stock Prices and Exchange Rate movements: Evidence from Pakistan

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Abstract

This study is considered the interplay between stock prices and exchange rates movement in perspective of Pakistan. Interrelation of both sides of these two financial variables are discovered. Monthly time series data from July 1992 to June 2018 of USD/PKR and the index values of PSE (KSE 100 index) are used in this study. To check out the stationarity of variables augmented dicky-fuller unit root test is applied and Johansson's co-integration technique in vector autoregressive model is used and granger causality test is used to consider the movements of stock prices and exchange rates and flow of these variables onto each other. Results of these analyses confess that there is no co-integration in stock prices and exchange rates. These two financial variables do not impact on the performance of each other and do not have ability to change the direction of each other because of the developing economy of Pakistan. These findings are valuable for econometrics, policy makers and stakeholders.

Key words: Stock Price, Exchange Rates, Granger Causality, Co-Integration, Vector Autoregressive

Introduction

Price of stock market is very valuable indicator in the economy of the country. The movement in prices of stock market clearly manifests the economic conditions of that country. When we talk about the economic conditions in Pakistan and want to know about their economic wealth and sustainable growth, one thing that gives us a clear image accordingly and more closely, is the price of stock market. For the reason, the prices of stock market are one of those variables that demand an environment where the condition of economy is strong, and

factors of sustainable growth are included in economy. Therefore, the growth of prices of stock market not only shows its own performance which tells about the conditions of that economy. On the other hand, the currency value relates to the growth of an economy. This is the variable that demands a strong economic condition for its own strong value. The value of currency is also a represent amen of an economy. If the economy has sustainable growth and the environment supports the growth of that economy, then the currency of that country appreciates according to the passage of time and the strong currency value is the proof of strong economy of a country. The uncertainty of an economy is the cause to depreciation of its currency because the growth of economy does not increase subsequently and if the conditions of that economy are not strong then the other currencies of other economies are increased from them and the difference between these currencies is increased because the value of their currency decreases.

Prices of stock market and the exchange rates are valuable variables of the economy of Pakistan. If we talk about the nature of these variables both need sustainable growth of economy of Pakistan for their own growth because the growth of these variables is related to the growth of Pakistan's economy. When the economy of Pakistan declines, the prices of stock markets and the exchange rates also move the directions of economy onto negative side and when the Pakistan's economy goes onto boom level these two variables also move onto peak. Exchange rates and the prices of stock market movements in Pakistan are related to the economic conditions of Pakistan. This thing is common in both and it depends upon the economy of Pakistan if the economic conditions are good and the policies are helpful for these variables than the prices of stock market increase and the currency of Pakistan gets strong and the movements of these two variables onto positive side. When the economic conditions are not good or the polices are not helpful for these variables then the uncertainty comes between them and the value of prices of stock markets and the movement of exchange rates go onto negative side.

Interplay between the prices of stock market and the exchange rate movements is very interesting and informational study after knowing the relationship between the exchange rates and prices of stock market in Pakistan, we can easily understand that both variables have caused

the impact onto the performance of other or not and anyone of them has ability to change the direction of other. The causation relationship inside of prices of stock market and the exchange rates are very important and debatable. Equity markets and currency markets have different causes to impact each other and they both play very attractive role in the economy of a country.

Classical economic theory suggests about the two points of view to explain the causation interlink into the prices of stock market and the exchange rates, the flow-oriented model and second is stock-oriented model.

The first approach (Dornbusch and Fisher 1980) says that the changing in rate of exchange are the cause to impact onto the stock prices. This model has the basic idea that stock market prices tell about the value of the discounted present of a firm and the expected flow of cash of future and any phenomenon that has effect onto the firm flow of cash must make its own impact on that firm stock price in case. If the efficient market is as the hypothesis of the efficient market is suggested and the movements of the exchange rates are one such phenomenon. If we talk about the earliest one distinction of how exchange rates make their impact on stock prices that are according to the base or nature of the firm that the firm of which talk about is domestic or international (Franck and Young 1972). In the perspective of the multinational firm, the rate of exchange changing makes impact onto the value of its operations of multinational level and that is the reason and cause to change in share prices. The perspective in which the movement of the currency that solidly influences at the earnings of the firm or entity hence stock price that is under control in the features of company or firm. In fact, many firms avail the strategies of staying safe from the exchange rates movements that use hedging techniques and use different methods to minimize their risk like options (call option and putt option) that help to reduce the level of risk for a firm's earnings specially in case of the movements of exchange rates. The hedging techniques reduce the level of risk and save the income of the firm and is helpful tool for the sustainable growth of the firm.

On the other hand, the stock-oriented model and other name of portfolio balance model (Branson 1977) says that the changes in the

prices of the stock are cause of changes in the rates of exchanging. The selling and buying is the source to convert the domestic currency into foreign currency in their back impact onto the movement of domestic stock market has the cause to flow of changing the stock market through the currency market. If we talk about the level in which the stock-oriented model explains the reaction of currency market and real-world stock depends on issues like the segmentation of stock market and the liquidity. For example the liquidity markets make it much difficult to buy and sell for the investors less timely and on the other side if we talk about the segmented markets initials imperfections such as the policies of the regime base like current government at that time on investment and if the government increases the cost of every transaction at very high level, it becomes the cause of making them imperfections and also if there is the high risk of currency that also causes to impact the performance and becomes the cause of hurdles onto them.

These factors are the cause to lay down the foreign investment and make it difficult for foreign investors to invest in that economy by its situations that is may be by the government or any other circumstances (Eiteman 2004). These two approaches are telling about the interplay of rates of exchange and the prices of stock movements and this is the base of support or rejection of any result of a study.

Today the economies have different challenges to make certainty in economic growth therefore this is important to make policies to make certainty in the fluctuation of stock prices and the exchange rates if we control them we can go towards the sustainable growth. The role of capital markets in the economy of a country cannot be undermined. The exchange rates movements have importance to judge the progress of an economy. These two variables have top of the page of economic observation by the researchers in any country. The instability in exchange rates in previous years in Pakistan is a major problem for the policy makers and citizens. This is necessary to take those strategic decisions that have given the better outcome. The stability and progress in equity markets and currency markets are necessary for the growth of a country.

The instability in exchange rates in previous years in Pakistan is a major problem for the policy makers and citizens. There is necessary to take those strategic decisions that have given the better outcome. The better and correct policies give right directions to the economy and good policies also help for sustainable growth. To make this possible we must know about the factors that influence our economic variables.

If both variables are dependent on each other like the exchange rates cause to influence onto the performance of exchanging rates and they have this ability to change the direction of stock prices, then the strategic decisions are according to this situation and the policies are according to this ground reality and the policies are different from the above situation. It is also possible that the exchange rates and the stock prices are independent the exchange rates have not a cause to influence into the movements of stock prices and the stock prices move into their own direction without seeking any impact of exchange rates and the exchange rates move into their own direction without seeking any impact of stock prices and the stock prices have not a cause to influence into the performance of exchange rates. In this perspective the strategic decisions are totally different from the above parameter because in this situation the things are totally different. This all the picture of that situation that I want to find in this study on the base of my analysis because If we know the interplay of the exchange rates and the stock prices movements then we can make those strategic decisions that favor the economy of Pakistan and the policy makers make the policies according to that situation. So, the object of the study is to know about the interplay into the prices of stock and the rates of exchange in Pakistan. The findings of this study are fruitful for different kind of personalities in Pakistan to learn how the exchange rates and stock market index behave with each other.

Literature Review

In previous studies the mixed results are indicated. The findings of many studies are the rate of exchange that is due to change of stock prices in market and different other authors say in their studies that the prices of the market of stock are due to change in the rates of exchange.

Franck and Young (1972), it was the first study to check the interplay into the stock price and rates of exchange in market. They use rates of exchange of six different currencies to check the results. Their findings show that there is not any relationship into the prices of stock market and the exchanging rates.

Soenen and Hennigar (1988) find out the significant correlation in the form of negative between the us exchanging rates and stock market prices that supports to stock-oriented model 1980-1986.

Bahmani-Oskooee and Sohrabian (1992) used the test of causality and the other one test is the co-integration to examine the US rates of exchange and US S&P 500 index prices 1973-1088. They found the bi-directional granger causality of granger into the rates of exchange and the prices of stock market which support both flow-oriented and stock-oriented model.

Ajayi and Mougouė (1996) examine intertemporal relation into stock index and rates of exchange of eight developed phase economies including Canada, France, UK, USA, Germany, Italy, Japan and Netherlands. The data they used the Daly time series data from April 1981 to July 1991. They use the model of vector error correction to test the short run and the long run relationship of the two variables of that economies. They found both short run and in the form of long run relation in the variables and show that the increase in the domestic stock indices have negative impact onto the exchange rates of their domestic currency. On the other side in long run the increasing in stock indices are the positive impact on the domestic currency value. They also analyze in their study that the depreciation in the currency negatively impact on stock indices and these impact negatively in long run onto the stock indices.

Abdalla and Murinde (1997) examine the linkage into the price of stocks and rates of exchange of the four economies of emerging phase India Pakistan, Philippine and Korea the data they use is monthly data from January 1985 to July 1994. By using the vector auto-regressive model. They find the causality in form of Uni-directional from rates of exchange to prices of stock of all the sample economies of their study except the Philippines

Bahmani-Oskooee and Domac (1997) make this first study in developing economy like Turkey after the different study that gives there results onto the developed economies. The two exchange rates are used in their study the lira dollar rate and lira market rate these two rates are defined in their study as liras per US dollar and liras per German mark respectively. In their study they find the long run the relation into the prices of stock and the two rates of exchange (lira-dollar and the lira-mark) using the Engle granger and Johannsen jealous co-integration technique. and show the results of the short run could be in either direction.

Ajayi, Friedman et al. (1998) check out the relationship into the rates of exchanging and the prices of stock market of some developed and developing countries. The seven developed countries Canada, Germany, France, Italy, Japan, UK, and USA. The data theta they used from April 1985 to the august 1991. Eight Asian emerging phased markets Taiwan, Korea, Philippines, Malaysia, Singapore, Hong Kong, Indonesia and Thailand. The data into it they used that have started from December 19987 and ends in September 1991. They use the granger causality testing. They found that the prices of stock cause the effect of exchange rates in developed countries because their economies are stay able and do not depend on exchange rates and that support to stock-oriented model.

Granger, Huangb et al. (2000) check out the relationship into the rates of exchange and the stock market prices of South East Asian economies like Hong Kong, Indonesia, Japan, Malaysia, Singapore, South Korea, Philippines, Taiwan and Thailand of the ends of 1990s and they found the very little causation between the rate of exchanging and stock market prices before the crises period and found the rates of exchange led prices of stock according to the flow model. After the crises period they found changing in exchange rates still led for Singapore and reverse for Hong Kong and Taiwan which support the model of stock-oriented.

Muhammad, Rasheed et al. (2002) examine these two variables of four South Asian economies, Pakistan, Bangladesh, India and Sri-Lanka, they used the monthly data of 1994 to 2000. They use vector error correction modeling method and test of granger causality. They

do not find short run and any long run relationship into stock price and exchange rates in Pakistan and India and short run relationship in the Sri-lank and Bangladesh however a long run relationship has these two variables in this country.

Farooq, Keung et al. (2004) analyzes empirical relation among the four different indices of Pakistan stock exchange PSX including the general 100 index, financial sector index, and another index of industrial sector index, and the last is service sector index with exchange rates. The data they use in their study is monthly time series data from January 1994 to December 2003. To analyze the causation relation between the two variables they use the Granger (1969) technique.

Ramasamy and Yeung (2005) used the same economies if Granger (2000) and found some reverse results of the Grangers study. He said that the results of Granger may correct because the factors are changed, and the factors also influence on the study like economic factors, time and data analysis.

(Richards, Simpson et al. (2007) investigate the interplay into the prices of stock and rates of exchange in the context of Australia. Data used in the study observations of daily prices of Australian stock exchange and Australian-US Doller exchange rates started from 2nd January 2003 and ends on 30 June 2006. They used the test of the granger causality and found the flow of stock prices to exchange rates and there is a positive co integration relationship into rates of exchange and the stock market prices.

Tudor and Popescu-Dutaa (2012) examine in their study the granger causality between the thirteen developed and developing countries including Australia, Canada, Japan, Hong Kong, UK, USA and France and the other six are Brazil, China, India, Korea, Russia and South Africa. The monthly time series data is used in their study for their analysis and to check the interplay into these two different variables of thirteen developed and developing selected countries from the January 1997 to the March 2012 of their study the granger causality technique.

In case of Korea their results show that the Korean exchange rates with dollar KWR_USD are leading the Korean stock market price

or index. So, there are two approaches in economic theory to explain the causation relationship into the prices of stock and rates of exchange the flow-oriented model point of view and stock-oriented modeling point of view.

Data and methodology

The data used in this study is the monthly time series data from July 1998 to June 2018. With 228 observations of stock index and 228 observations of USD/PKR exchange rates and the total observations are 456 used in this study for analysis. The data sources are the data of exchange rates collected from www.opendors.com and www.forex.com.pk the data of stock prices are collected from www.khistocks.com.pk.

We examine the flow of our variables to each other if the rates of exchange effect the stock market prices then the policies are according to the rates of exchange and if the stock market prices affect the rates of exchange then the policies are different. Therefore, we measure our variables with different models and tests to collect different results to support our study.

To check stationarity of variables unit root test are applied.

$$Yt = ¹ + Á1Yt¡1 + Á2Yt¡2 +:ÁpYt¡p + ²t$$

If the null hypotheses in above from 0.05 then the series are none stationery and if below, then stationary at level and may become change at first difference. To test the null hypothesis augmented dicky fuller test are used (Dickey and Fuller 1979). To test the null hypothesis and where does the first difference operate Phillips Peron (PP) unit root test applied (Phillips and Perron 1988). Kwiatkowski-Phillips-Schmidt-Shin Test is used (Kwiatkowski, Phillips et al. 1992). The structural break exists in our variables or not in 2008-2009 to find this structural (CHOW) breakpoint test used.

Vector auto-regressive model is used.

$$Yt = a + A1Yt\text{-}1 + A2Yt\text{-}2 + \ldots + ApYt\text{-}p + \varepsilon t$$

The series are non-stationary at level and stationary at first difference therefore Johannsson's co-integration technique is used in this study (Johansen 1992).

$$\Delta xt = X\ k{-}1\ i{=}1\ \Pi i \Delta xt{-}i + ut$$

To test the Causality of exchange rates and stock prices the granger causality test is applied(Granger 1980).

$$F(Yt{+}h|\Omega t) = F(yt{+}h|\Omega t - Xt)$$

After applying ADF (augmented dicky fuller) unit root test the results show the non-stationary of series at level and the stationarity of the series at first difference. The null hypotheses reject at level because the series are non-stationary. But at the first difference the null hypothesis is not rejected because the series are stationary. Johansson co-integration techniques are required to apply in vector auto-regressive because of the stationarity of the series.

After finding that the none stationarity in the series at level and stationarity in first difference the Johansson co-integration technique applies according to this examination in our study the technique proves that there is no co integration at the 0.05 level.

The granger causality test examines both series (rates of exchange and prices of stock market) and show that the stock prices do not granger cause to the exchange rates and the exchange rates do not granger cause to the stock prices. So, there are no causality between these two variables.

The results also show that the both variables have not impact or changing of each other and one of them cannot change the direction of other.

These results are the evidence of rejection the relationship of these two variables rates of exchange and prices of stock market and reject the cause of changing in one on the cause of another variable.

The results show that there is no causation relationship between these two variables and none of these is causing to change onto the others value so there is not impact on any of them variable to change the other variables performance or value.

Findings

After applying ADF (augmented dicky fuller) unit root test the results show that the non-stationarity in the series at level and the stationarity in the series at first difference. The null hypotheses reject at level because the series are non-stationary. But at difference of first the null hypothesis is not rejecting because the series are stationary. So, at level there is no trend in the series.

When the VAR (vector auto-regressive) model is applied and they show these are not having a significant impact of these two variables on each other and reject the impact of one to another. So, after finding that our series are none stationary at level and stationary at first difference the Johansson co-integration technique is applied according to this examination in our study the technique proves that there is no co integration at the 0.05 level.

The granger causality test examines both series (exchange rates and stock market prices) and shows that the stock prices do not granger cause to the exchange rates and the exchange rates does not granger cause to the stock prices. So, there are no causality between these two variables. That is the basic evidence of rejection of interplay of the two variables of stock market prices and exchange rates.

The results show that there is no causation relationship into these two variables and none of them are causing change onto the others value so there is not any impact on either variable to change the other variables performance or value. So, this thing is clear in this study after the analysis of granger causality test the variables of exchange rates and prices of the stock market are not causation relationship in the perspective of Pakistan. In case of the other countries specially developed economies these two variables prices of the stock market and exchanging rates cause to impact onto the performance of each other the flow of exchange rates to the stock market prices is proved in different studies and also the flow of prices of stock market to the exchange rates which is proved in different studies and some of them proved the flow of these two variables on each other. if the exchange rates cause to impact onto the performance of the stock prices in a country the stock prices are causing to impact onto the performance of exchange rates in other country. But in this

study, I find the contrast results of these studies the results of my study reject the causation relationship of exchanging rates and the prices of stock market in Pakistan.

Conclusion

This study examined the interplay into stock prices and rates of exchange. The data is used in this study is the monthly time series data at the duration of July 1998 to June 2018. In this study the variables are none stationary at level and stationary at first differences therefore Johansson's co-integration technique is applied. The test indicates no co-integration at the 0.05 level. This thing is clear in this study after the analysis of Johansson's co-integration technique the variables of exchanging rates and prices of stock market are not co-integrated in the perspective of Pakistan. In case of the other countries specially developed economies these two variables prices of stock and exchanging rates are co-integrated which is proved in different studies but in this study, I find the contrast results of these studies, the results of my study reject the co-integration of exchanging rates and the prices of stock in Pakistan.

This study used the monthly data of two variables. To check the interplay between exchange rates and prices of stock market movements more closely the weekly and daily observations are useable for results because the weekly and daily data gives more significant results. I also examine two variables if include other variable like inflation and in this study, I used the PSE (KSE 100 index) where the (KSE 30 index) also exists if both are utilized then may be the outcome are different and different stock sectors like goods services are useable that gives more valuable results. On the exchange rate side in this study used the exchange rate of USD/PKR that gives the results in perspective of only one exchange rates, if the more exchange rates like Chinese yuan and Japanese yen Brittan pound included that give more close results.

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