

IMPACT OF FOREX RATE ON THE STOCK PRICES OF IMEX FIRMS IN PAKISTAN: A CASE STUDY OF TEXTILE, CHEMICAL, CEMENT AND STEEL MILLS

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ABSTRACT

The study investigated the impact of Forex rate on stock prices of IMEX firms in Pakistan. Monthly Time series data were used from January 2010 to December 2016. The main objective of this study was to investigate the Impact of Forex rate on stock prices of import and export firms in Pakistan. Augmented Dickey-Fuller test is used to check the stationarity of time series data. Results of ADF test indicate that all variables are stationary at level. Co-integration is checked by Granger causality. Results of Granger Causality indicate that there is a long-run relationship between Forex rate and importing stock prices but there is no long-run relationship between Forex rate and exporting stock prices due to import oriented nature of the country. It is recommended that in future researchers can conduct the same study in other sector and industry as a whole so that the result may be clearly shown.

Keywords: Stock prices, IMEX, Forex Rate, Granger Causality, ADF test

INTRODUCTION

In the most recent past the emergence of new capital markets, increasing international diversification Phylaktis and Ravazzolo (2005), adopting the Forex rate arrangements that are more flexible and more relaxed mode of foreign capital control have increased the importance of dependency of stock prices over Forex rate. And it also increases the interest of practitioners and academia's to study the interaction and relationship between Forex rate and stock prices (Odoyo, Muasya, & Kenneth, 2014). The study aims to investigate the relationship between Forex rate and stock prices of firms. That what kind of relationship exists among the mentioned variables, and also to find out the direction of causality through empirical analysis i.e. whether unidirectional or bi-directional. The basic and earliest distinction between whether Forex rate fluctuations affect stock prices, the earlier researchers used to divide the firms as domestic and international or multinational (Franck & Young, 1972). Forex rate volatility has no impact on domestic firms while can affect stock price volatility of international or multinational firm. As due to their international operations their profits and losses can be shown in the books of financial statements that would ultimately affect the stock prices and stock return volatility. Classical economic theory believes that Forex rate and stock prices interact with each other. This means Forex rate volatility brings changes in the stock prices and stock return. According to Richards and Evans (2009), various approaches are followed to find out the impact of the Forex rate and stock price and stock return volatility. Two of them are mostly used to find out the impact and relation among the mentioned variables. One is a flow oriented model and the other is a stock-oriented model or portfolio balanced approach.

The flow-oriented model was presented by Dornbusch and Fischer in 1980. The flow oriented model postulates that Forex rate can affect stock price movements. This approach shows uni-directional

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causality that starts from Forex rate and ends at stock prices. It means that Forex rate causes stock returns and stock price volatility. Contrary to flow oriented model, stock oriented model or portfolio balanced approach, presented by Branson et al. (1977), states that changes in the stock prices cause variability in the Forex rate.

The deep analysis of the relationship of Forex rate and stock price movements will definitely help IMEX firms to make an effective strategy so that firms can get benefits from the Forex rate fluctuations. This is used to make sure to be on the safe side from the negative shocks of Forex rate fluctuation (Odoyo, Muasya, & Kenneth, 2014). It means that to get all upsides from the fluctuation in the Forex rate and make the precautionary measures in order to avoid all downsides of Forex rate fluctuations.

1.1 Objective of the study

The objective of the study is to find out the impact of Forex rate on the stock prices of IMEX firms and the long run relationship among mentioned variables.

- To find the relationship between Forex rate and stock price of IMEX firms.
- To investigate the causality between Forex rate and stock price of IMEX firm.
- To investigate the significance level of Forex rate on the stock price of IMEX firm.

1.2 Research Question

- What is the relationship between Forex rate and stock price of IMEX firms?
- What is the factors causality between Forex rate and stock price of IMEX firm?
- What is the significance level of Forex rate on the stock price of IMEX firm?

1.3 Research Hypothesis

As the purpose of the study is to find the impact of Forex rate on the stock prices of IMEX firms.

Hence, the hypothesis for the study can be developed as:

H_o = There is no significance impact of Forex rate on stock price of IMEX firm.

H_a = There is significance impact of Forex rate on stock price of IMEX firm.

1.4 Significance of the study

The results of this study will have a significant importance and have greater value for the practitioners and policymakers. As this study throws light on the Forex rate volatility and the volatility of stock prices of IMEX firms, therefore the firms that are exposed to the international trade must make a sense from the findings of the study. As to avoid the negative shocks from the Forex rate fluctuations by taking help from the derivative instruments like futures, forwards and options.

LITERATURE REVIEW

2.1 Forex Rate Explanation

Suranovic (2010) With reference to the book International finance theory and policy, Forex rate is the rate at which one country's currency can be represented in terms of other country's currency. He

further stated that there are two components of Forex rate. Domestic currency and foreign currency. To quote the Forex rate, there are two ways that are directly and indirectly. When foreign currency is expressed in domestic currency, it is direct approach and when domestic currency is expressed in foreign currency, it is called an indirect approach.

Chen and Chen (2012) explained that there are two types of Forex rate. One is spot Forex rate and the other is forward Forex rate. Spot Forex rate is the current Forex rate and the forward Forex rate means Forex rate at some future date but fixed today in order to carry out a transaction in future. Forward Forex rate is used to mitigate the Forex rate risk.

Parham and Tang (2017) have conducted a study and analyzed that the interface between stock prices and exchange rates in middle-east countries. However, the results of the study were limited to selected economies. Moreover, there are many existing studies test for Granger causality in a bi-variate setting which in turn leads to different causality results.

Eichengreen and Hausmann (1999) suggested, that there are some Forex rate systems that are classified by the degree of control by the state. The Forex rate systems may fall in one of these categories, fixed Forex rate system, freely floating Forex rate system, managed float Forex rate system, pegged Forex rate system. Each system has its own pro and cons. Each country adopts the Forex rate system which is most suited to them.

2.2 The Effect of Forex rate on the Economy

Eichengreen and Hausmann (1999) conducted a study and concluded that there was a vital impact of Forex rate on the entire economy of a country. Some people believe that strong currency is favorable for the economy as it makes it cheaper to travel across the globe or pay less for the imported goods and services. But on the other hand, we receive less from the exported goods and services. Therefore some people are in favor of weak currency. And researches showed that weak currency gives more benefits to the economy as compared to the strong currency. Variation in the Forex rate has a direct impact on the following aspects of the economy.

2.3 Balance of Trade

Rodrik (2007) investigated that Forex rate has a vital impact on Balance of trade. As we know that country imports goods and services of its needs and exports goods and services which are in excess. Due to which some cash inflow and outflow have taken place. When exports exceed imports, it is known as a trade surplus and when imports exceed exports, it is known as the trade deficit. Weaker currency usually used to stimulate the exports and the imports became more expensive. It contributes to the decrease in trade deficit or increase in the trade surplus. A stronger currency will stimulate imports and exports become more expensive due to which export competitiveness should be lost and imports become cheaper. It contributes to increase trade deficit or decrease in trade surplus.

2.4 Gross Domestic Product

Suranovic (2010) the author cited the book, International finance theory, and policy as a reference to this context and come to know that the use of the fundamental formula for the nations GDP:

$$GDP=C+I+G+(X-M)$$

Whereas

C = Consumer spending

I = Investment by business and household

G = Government spending

(X-M) = Exports – imports (net exports)

The equation clearly shows that higher the value of net exports higher will be the value of GDP and lower the value of net exports lower will be the value of GDP. Therefore, as GDP is the economic indicator of the economy, it is also affected by Forex rate fluctuations.

2.5 Capital Flows

James (1995) stated that when the country's currency is strong, then it will attract the foreign investment into the country and if weak then vice versa. In both the cases, Forex rate of a country is affected. Capital flows have two types, one is a foreign direct investment and the other is foreign portfolio investment.

2.6 Inflation

The concept that how Forex rate effect the inflation is taken from the book of “International finance theory and policy” states that in those countries which are mostly import-oriented, the depreciation in the Forex rate cause inflation to rise (Suranovic, 2010). This inflation is charged directly to the ultimate consumer by making him pay more for the same amount of goods and services and reduce their real income (Sanaullah, Ali, Farmanullah & Furhanullah, 2017).

2.7 Theories about Forex rate and Stock Prices

Classical economic theory believes that Forex rate and stock prices can interact with each other. That means Forex rate volatility brings volatility in the stock prices and stock return. But further research shows that this case may not be so common in all situations. In some cases, Forex rate cannot cause the volatility in stock prices and stock return. And this may be the case where the firm domestic in nature instead of international or multinational.

Richards, Simpson, and Evans (2007) various approaches are followed to find out the impact of the Forex rate and stock price and stock return volatility. Two of them are mostly used to find out the impact and relation among the mentioned variables. One is a flow oriented model and the other is a stock-oriented model or portfolio balanced approach.

The flow oriented model postulates that Forex rate can affect stock price movements. This approach shows unidirectional causality that starts from Forex rate and ends at stock prices. It means that Forex rate causes stock returns and stock price volatility. Actually, this theory explained the phenomena in such a way that Forex rate fluctuation affects the future cash flows of the firm. So when the cash flow of the firm is affected, the profitability of the firm is directly affected. And when the profitability of the firm is affected then simultaneously earning per share (EPS) of the firm will also be affected and hence the stock prices and stock return volatility will be affected (Dornbusch & Fischer, 1980).

2.8 Impact on Importer and Exporter

According to Evidence and James (1995) that there was a clear and logical relationship between Forex rate and stock prices of IMEX firms. The depreciation in the Forex rate has a negative impact on imports while has a positive impact on exports. On the other hand appreciation in the Forex, the rate has a positive impact on imports and has a negative impact on exports. This theory is proved by various experts many times in their researches. So ultimate effect falls on the earnings of the firm. So if the earning of the firm rises, the earning per share will also rise and hence the demand for stocks will raise that affect the share price and vice versa. So conclusively the variability in the Forex rate has an impact on the stock prices.

DATA AND METHODOLOGY

The study aimed to investigate the impact of Forex rate on the stock prices of IMEX firms, long-run relationship between Forex rate and stock prices and the direction of causality.

3.1 Data

The study uses the secondary data of monthly stock prices of IMEX firms and the prevailing Forex rate for the same period. The data is collected from different sites like Pakistan stock exchange site and State bank of Pakistan site. The time period for the examination of impact is 7 years, 2010 to 2016.

3.2 Population and Sample Size

The population for the study is all the importing firms and exporting firms listed at Pakistan stock exchange. Therefore the study divides the stock prices into two portfolios, importing firms and exporting firms. The sample for the study includes the firms in cement industry, textile industry, chemical industry and steel mills. Importing firms consists of two industries: chemical industry and steel mills. Exporting firms consists of two industries i.e. cement industry and textile industry. Each industry consists of 5 companies. Companies included are Chenab limited, Kohinoor Mills, Nishat Mills Limited, Deewan textile Mills Limited, Gadoon textile mills limited, D.G.Khan cement, Kohat cement, Cherat Cement, Lucky cement, Attock cement Pakistan limited, Crescent steel and allied, Pakistan steel mills, Ayesha Steel mills, inter steels limited, Descon Chemicals limited, Ittihad chemicals limited, Nimir Industrial chemicals, ICI Pakistan limited, and Dynea Pakistan.

Table:1 IMEX Firms

Cement Industry (Exporting)	DGKhan cement,
	Kohat cement,
	Cherat cement,
	Attock cement Pakistan limited,
	Lucky cement.

Textile Industry (Exporting)	Chenab limited,
	Kohinoor Mills,
	Nishat Mills Limited,
	Deewan textile Mills Limited,
	Gadoon textile mills limited.
Steel Industry (Importing)	Crescent steel and allied,
	Pakistan steel mills,
	Ayesha Steel mills,
	inter steels limited,
	Metropolitan Steel Corporation Ltd.
Chemical Industry (Importing)	Descon Chemicals limited,
	Ittehad chemicals limited,
	Nimir Industrial chemicals,
	ICI Pakistan limited,
	Dynea Pakistan

As it is the monthly data of 7 years for 20 companies, therefore the study examines the average of the observations as done by Odoyo, Muasya, and Kenneth (2014).

METHODOLOGY

The techniques used to examine the impact of monthly Forex on monthly stock prices of IMEX portfolios are augmented dickey-fuller (ADF) unit root test, standard Granger causality test and Co-integration test as used by Abdalla and Murinde (1997). Augmented dickey-fuller unit root test is used to find the stationarity of the data i.e. the nonstationarity at level and stationarity at first difference. Co-integration test is used to find out the long run relationship between two variables. The relationship is shown by p-value, when p value is less than 5%, we will accept alternate hypothesis that means that there is a long-run relationship between variables and when the p-value is greater than 5%, then we will accept the null hypothesis that means that there is no long-run relationship between variables. And standard Granger causality test is used to find the long-term relationship between the variables and the direction of causality. That means that either the causation is unidirectional or Bi-directional. Here, the interpretation for p-value is same as above.

4.1 Research Model

In analyzing the impact of Forex rate on average stock prices of IMEX firms separately, therefore the research uses two separate models, one is for importing stocks and the other one is for exporting stocks.

For importing portfolio:

$$IMPST = a + bForex + \varepsilon_t$$

Exporting portfolio:

$$EXPST = a + bForex + \varepsilon_t$$

4.2 Variables Definition

The variables used in both the models are Forex,

IMPST (average of the stocks of importing firms) and *EXPST* (average of the stocks of exporting firms).

Forex: Forex rate that is the independent variable

α : is constant

IMPST: average stock prices of importing firms that is the dependent variable

EXPST: average stock prices of exporting firms that are the dependent variable

ε_t : Error term

RESULTS AND DISCUSSION

The study investigates the impact of Forex rate on the stock prices of IMEX firms. In order to find the impact, the study follows the following tests like ADF unit root test, Co-integration test, and Granger causality test.

Table: 2 Unit Root of Forex rate at Level and First Difference

Variables	t-statistic		Probability		Diagnoses of stationarity at...
	I (0)	I (1)	I (0)	I (1)	
Forex rate (Forex)	-0.9566	-7.3344	0.7692	0.0000	I (1)
Importing stock prices (IMPST)	-0.0206	-7.4225	0.9525	0.0000	I (1)
Exporting stock prices (EXPST)	0.1082	-7.0452	0.9638	0.0000	I (1)

All the variables in the study i.e. Forex rate, importing stock prices and exporting stock prices are non-stationary at level as the p-value is greater than 5% hence H_0 can't be rejected but as move on the first level, all the variables are stationary as the p-value is less than 5% hence H_1 should be accepted and H_0 should be rejected.

Table: 3 Granger Causality between Forex rate and Importing Stock Prices (Lag: 2)

Null Hypothesis	Observations	F-statistics	Probability
FOREX does not Granger Cause IMPST	58	10.2901	0.0002
IMPST does not Granger Cause FOREX		0.65972	0.5212

Here as discussed that the first null hypothesis is, Forex rate does not Granger cause importing stock prices is rejected that means alternative accepted because Forex rate Granger causes importing stock prices as the probability is less than 5% or 0.05. On the other hand, the second null hypothesis i.e. importing stock prices does not Granger causes Forex rate cannot be rejected as the probability is greater than 5% or 0.05. So, in short, the changes in the importing stock prices are due to changes in the Forex rate only. The causation is unidirectional. This direction of causality is the proof of flow oriented model. The results are same as by the study of Abdalla and Murinde (1997) and Aggrawal (1981) who concludes that when the big importing firms face huge Forex rate risk then the impact of Forex rate is clearly seen in the firm's stock prices.

Table: 4 Granger causality between Forex rate and exporting stock prices (Lag: 2)

Null Hypothesis	Observations	F-statistics	Probability
FOREX does not Granger Cause EXPST	58	4.73375	0.0128
EXPST does not Granger Cause FOREX		2.08801	0.1340

As showed in the above table 4 that first null hypothesis, Forex rate does not Granger cause exporting stock prices is rejected that mean alternative accepted because Forex rate Granger causes exporting stock prices as the probability is less than 5% or 0.05. On the other hand, the second null hypothesis i.e. exporting stock prices does not Granger causes Forex rate can't be rejected as the probability is greater than 5% or 0.05. So, in short, the changes in the exporting stock prices are due to changes in the Forex rate only. The causation is unidirectional. This direction of causality is the proof of flow oriented model. The results are same as by the study of Abdalla and Murinde (1997) and Aggrawal (1981), they concluded that when the big exporting firms face huge Forex rate risk then the impact of Forex rate is clearly seen in the firm's stock prices.

Table: 5 Co-integration Test for Importing Stock Prices

Hypothesized No. of CE(s)	Eigenvalue	Trace statistics	0.05 critical value	Probability**
None*	0.277131	19.34131	15.49471	0.0125
At most 1	0.008903	0.518704	3.841466	0.4714

Here it can be seen that the probability value (p-value) is 0.0125 that means 1.25% that shows that there is a long-run relationship between Forex rate and stock prices of importing firms. Because here the null hypothesis is that there is no long-run relationship and the alternative hypothesis is that there is a long-run relationship between the mentioned variables. So as the probability is less than 10% or 0.01, therefore, the null hypothesis is rejected and alternate hypothesis is accepted i.e. there is a long-

run relationship between Forex rate and stock prices of importing firms.

Table: 6 Co-integration Test for Exporting Stock Prices

Hypothesized No. of CE(s)	Eigenvalue	Trace statistics	0.05 critical value	Probability**
None	0.197952	12.82392	15.4971	0.1214
At most 1	0.000515	0.029885	3.841466	0.8627

Here it can be seen that the probability value (p-value) is 0.1214 that means 1.25% that shows that there is no long-run relationship between Forex rate and stock prices of exporting firms. Because here the null hypothesis is that there is no long-run relationship and the alternative hypothesis is that there is long-run relationship between the mentioned variables. So as the probability is greater than 10% or 0.01, therefore, the null hypothesis is accepted and alternate hypothesis is rejected i.e. there is no long-run relationship between Forex rate and stock prices of exporting firms.

Results for Research Hypothesis

H_o =Forex rate has no impact on stock prices

H_1 =Forex rate has an impact on stock prices

Here according to the results of the study, we should reject H_o and accept H_1 (alternative) that means Forex rate has an impact on stock prices.

CONCLUSION

The study empirically examines the four industries selected as a sample for the study, two from importing and two from exporting and five companies from each industry making twenty companies. Then statistical tools like ADF unit root test, co-integration test, and Granger causality tests were applied in order to find out the impact and to prove that the study supports the flow oriented model. The results showed that Forex rate has a strong impact on stock prices and the causation is uni-directional as the direction of causality ran from Forex rate to stock prices that support the theory of flow oriented model. But the results of the co-integration test also showed that although there is long-run relationship between Forex rate and importing stock prices but there is no long-run relationship between Forex rate and exporting stock prices due to import oriented nature of the country.

6.1 Implications

This study suggests that the firms should adopt a policy to increase their foreign market value of shares to cope with the fluctuations of the exchange rate. The firms should consider forward exchange rate as to smooth delivery and payments on specific future dates. The balance of payments, interest rate level, inflation factors, fiscal and monetary policy, venture capital, government intervention and economic strength of a country should be considered while practicing imports and exports.

6.2 Future Research

Further research recommendations include that studies may be conducted in the other sector and industry as a whole so that the result may be clearly shown. The inclusion of PSX index prices may be another option for finding the broader and general impact.

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