Strategically determinants the impact of macroeconomic factors on import expenditures in Bangladesh

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Keywords
Import expenditure, Real exchange rate, Inflation rate, Interest rate, Bangladesh

Abstract

Purpose: The purpose of this study is to find out the impact of selected macroeconomic factors on imports in Bangladesh. This paper has been used the percentages of import expenditures of the total GDP as a dependent variable and real exchange rate, inflation rate and interest rate as an independent variable.

Research method: In this study, the time-series data analysis had been exploited for collecting data. Data were collected from various sources such as the World Bank, Economic Indicator, the Bureau of Statistics Bangladesh and the Central Bank of Bangladesh. To examine data, EViews 9 version has been used as the time-series data analysis. Numerous tests have been applied in this paper such as descriptive statistics, visual plot, Augmented Dickey-Fuller (ADF), Johansen test for co-integration, Error Correction Model (ECM), CUSUM and CUSUM square test.

Findings: The test results reveal that there was a positive relationship between import expenditure and inflation rate besides has a positive relationship between import and interest rate. Furthermore, this paper illustrates if the real exchange rate, inflation rate, and interest rates increase then the import expenditures also increase in the outlook of Bangladesh. Therefore, the import expenditures did not hold because of import expenditures ware highly influenced by selected macroeconomic variables during 1971-2018 in the economy of Bangladesh.

Introduction

Most of the country's economy is not entirely dependent only on its internal resources but also dependent on external resources. Sometimes the government buys products and services from in a foreign country by lower prices. When a country purchases foreign products and services by using foreign currency is called import expenditure. If the currency value of the Purchasing Power Parity (PPP) was increased at the same time the demand for the luxury product and services ware increase in an economy. If the quantity of import value is an increase than the demand-pull inflation should have to reduce for the sake of the country's economic stability. The real exchange rate is one of the vital factors for a country's economic development. The real exchange rate is greatly manipulated by not only the import expenditures but also the export earnings. The Central Bank of Bangladesh reserves foreign currency for domestic currencies coverage. Since the real exchange rate could change a country's overall economic circumstance, therefore, the policymaker should conscious about the exchange rate by maintaining and implementing the country's monetary policy.

The purpose of this study is to find out the impact of selected macroeconomic factors on import expenditures in Bangladesh for the period 1971-2018. The analysis of this discussion will help to rightly understand the relationship between real exchange rate, inflation rate, interest rate and the import percentage of Gross Domestic Product (GDP) to intensely discover a country's economic situation. Furthermore, the result of this study will help more significantly to compare the overall economy of Bangladesh with others in point of this relationship in all over the world.

Literature Review

Oluyemi & Isaac (2017) found that in Nigeria import expenditure highly affected by the real exchange rate, but on the other hand real exchange rate do not impact on real exchange rate. For their

study, they have used vector auto regression (VAR) model Augmented Dickey-Fuller (ADF). Alotaibi (2016) examined that there was a negative relationship between the exchange rate and import. He found that if import goes down that time real exchange rate also goes down. Sharma, Kautish & Kumar (2018) examined that in the long run there is a positive significant impact of government expenditure, foreign aid and foreign direct investment on economic growth in India. Their study also shows that in the long run there is a negative momentous relationship between the human capital index and real exchange rate on economic growth. For showing long-run dynamic relations they have used autoregressive distributed lag (ARDL) bounds, model. Rahman (2017) has found that in Bangladesh there has long-run co-integration between export and selected macroeconomic variables by testing the Johansen test for co-integration. His Variance Decomposition (VDC) test shows that in the short run there is no dynamic over the study period 2011to 2016.

Ramzan, Asif & Mustafa (2013) used Augmented Dickey-Fuller (ADF), Johansen Co-integration test and Ordinary Least Square (OLS) to examine the paper goal. Their paper demonstrates that in Pakistan there has a significant long-run relationship between trade openness and macroeconomic variables. In Ghana from the year 1980-2010 Real Gross Domestic Product (GDP) per capita income and macroeconomic factors (Antwi, et al 2013) are correlated. For their study, they have used time-series data and applied Augmented Dickey-Fuller (ADF), Johansen test for co-integration. In Ghana the impact of government spending positively, real exchange rate negatively, petroleum prices negatively, import of goods and services positively on industrial production (Enu, et al, 2013). They suggested that for achieving sustainable industrial growth and development government of Ghana should continue to stabilize the macroeconomic condition. Kemal & Qadir (2015) examined that in Pakistan there was a significant relationship between import, export and real exchange rate. Their study suggests that in the long-run real exchange rates positively impact imports and in short-run imports don't shock by the real exchange rate.

Corrigan (2005) has tried to explore the relationship between imports and inflation in the United States of America. His study results were different from earlier studies. His study's result suggests that the U.S. economy policymaker should concentrate on import trends and exchange rate value. Duasa (2009) examined that in Malaysia the real exchange rate shock significantly impacts import price fluctuation. He has been used vector error correction (VECM) and Malaysian monthly data. After reviewing lots of papers it is very clear that most of the research suggests that different types of macroeconomic policy. No study has done on this specific topic regarding macroeconomic factors affecting import expenditure in the Bangladesh period of 1971-2018. Thus, I have tried to explore this topic. For future study, the researcher can add different types of variables and analysis from different angles.

Objectives

The broad objective of this study is to find the impact of selected macroeconomic factors on import expenditures in Bangladesh's economy throughout 1971-2018. To find out the broad objectives that focus on some specific points. The specific objectives are,

1. To explore the impact of the Real exchange rate on import expenditures in Bangladesh.
2. To identify the influence of Inflation on import expenditures in Bangladesh.
3. To find out the impact of Interest rate on import expenditures in Bangladesh.

Methodology

This study fully based on secondary data. This paper didn't effort to deal with any primary sources of data. Paper has used different sorts of sources for collecting data, such as The World Development Indicator, Bangladesh Bureau of Statistics, the central bank of Bangladesh (Bangladesh Bank) and different Journals, etc. The Paper has been used real exchange rate, Inflation rate and Interest rate as independent variables and import expenditure as the dependent variable. For this study, I have used 48 years' time-series data (1971-2018). To examining data, EViews 9 version has

been used as the time-series data scrutiny. To finding out the paper goals by different types of the test had been applied.

Theory and Model

$Im_t = a + \beta_0 + \beta_1 Rer_t + \beta_2 Inf_t + \beta_3 Int_t + \epsilon_t$ ..... (1)

In this model Im_t is representing the Import percentage of GDP, Rer_t is Real exchange rate Inf_t is the Inflation rate and Int_t is the Interest rate. For examining the short-run dynamic in a relationship. Among import expenditure, Real exchange rate, Inflation rate, and Interest rate an ECM model has been developed.

$\Delta lnIm = a_0 + a_1 \Delta lnRer_{t-i} + a_2 lnInf_{t-i} + lnlInt_{t-i} + \Delta lnIm_{t-i} + a2U_{t-i} + \epsilon_t$

$Where, U_{t-1} = lnIm2_t - \beta_0 - \beta_1 lnRer_t - \beta_1 Inf_t - \beta_1 Int_t$ ..... (2)

Where, α4Ut-1- expresses the error correction term, it is the residual from the cointegration Equation, α3indicated the error correction coefficient and αi are the estimated short-term Coefficients (Jammeh, 2012).

Results

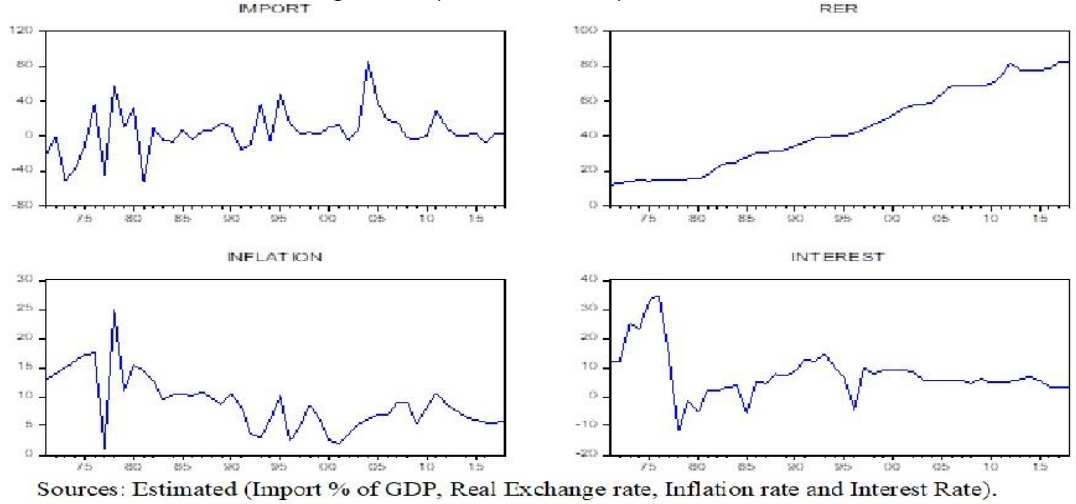
Econometric Estimations

Table 1: Descriptive statistics

	IMPORT	RER	INFLATION	INTEREST
Mean	5.551333	44.32292	8.915229	7.568458
Median	3.122000	40.24500	8.691000	5.936500
Maximum	84.74900	83.12000	25.00000	34.75000
Minimum	-52.51100	12.04000	1.000000	-11.68000
Std. Dev.	25.03514	23.57260	4.726371	8.379442
Skewness	0.332947	0.192860	0.908957	1.172744
Kurtosis	4.795502	1.668421	4.306676	5.935719
Jarque-Bera	7.334484	3.843766	10.02443	28.23952
Probability	0.025547	0.146331	0.006656	0.000001
Sum	266.4640	2127.500	427.9310	363.2860
Sum Sq. Dev.	29457.63	26116.37	1049.913	3300.108
Observations	48	48	48	48

Sources: Estimated (Im= Import % of GDP, Rer= Real Exchange rate, Inf= Inflation rate and Int= Interest Rate.

From table 1, descriptive statistics result shows that the import expenditure, real exchange rate, inflation rate, and interest rate are asymmetrically distributed. In this table positive Kurtosis meaning that all variable's distribution is peaked (Oskooee, 1993).



Sources: Estimated (Import % of GDP, Real Exchange rate, Inflation rate and Interest Rate).

Graph 1: Visual Plot

Graph 1 showing the trend all the variables from 1971 to 2018. Here real exchange rate shows this rate was upward sloping. Other variables are normal trend.

Table 2: Augmented Dickey Fuller (ADF) Unit Root Test:

Augmented Dickey Fuller Test (ADF) Unit Root Test			
Variable	C (constant) and T (trend) in the equation	ADF statistics	Optimum lag
Im	C and T	-6.778943	0
Rer	C and T	-5.562522	1
Inf	C and T	-8.822267	1
Int	C and T	-7.039349	0

Sources: Estimated (Im= Import % of GDP, Rer= Real Exchange rate, Inf= Inflation rate and Int= Interest Rate.

For testing stationery of the all variables Augmented Dickey-Fuller (ADF) test has been used. Augmented Dickey-Fuller (ADF) unit root test shows that all variables are stationary at 1st difference expect Import. Here imports expenditure is just only stationary at level.

Table 3: Johansen test for cointegration

Johansen Test for Co-integration						
Hypothesized No. of CE(s)	Trace statistic	0.05 Critical Value	Eigen value	Hypothesized No. of CE(s)	Max-Eigen Statistics	0.05 Critical Value
None *	45.40828	47.85613	0.384379	None *	22.31571	27.58434
At most 1	23.09258	29.79707	0.243375	At most 1	12.82883	21.13162
At most 2	10.26375	15.49471	0.199720	At most 2	10.24852	14.26460
At most 3	0.015229	3.841466	0.000331	At most 3	0.015229	3.841466

Table 3 represents the Johansen test for co-integration. Johansen test for co-integration shows that there has at least one co-integration equation in this model (Hong & Phillips, 2005). For this one co-integration the Trace statics, Eigenvalue and Max-Eigen value support it.

Table 4: Corresponding Adjustment Coefficients and Normalized Co-integrating Vectors

Normalized co integrating vectors and the corresponding adjustment coefficients				
Variable	**β coefficients**	**αCoefficients**	**Standard error**	**t-value**
Import	1.0000	-14.99511	-	-
RER	0.0327	0.110452	0.15644	0.44945
Inflation	1.6526	-0.864076	0.94425	2.23728
Interest	0.6924	-1.409773	0.37558	-1.72591
Constant	-23.2060	-	-	-

Sources: Estimated (Im= Import % of GDP, Rer= Real Exchange rate, Inf= Inflation rate and Int= Interest).

From table 4 paper has developed equation 3. From table 4 it can be concluded that there was a positive relationship among import expenditure, real exchange rate, inflation rate, and interest rate.

$Im_t = 1.0000 + 0.0327Rer_t + 1.6526Inf_t + 0.6924Int_t - 23.2060\epsilon_t$ ..... (3)

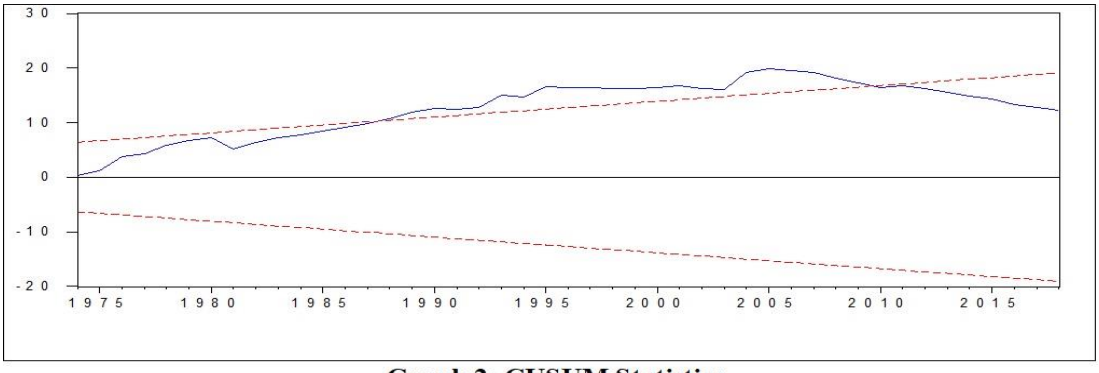
From this equation, it can be said that the real exchange rate, inflation rate, interest rate positively impacts on import expenditures.

Table: 5 Error Correction Representations

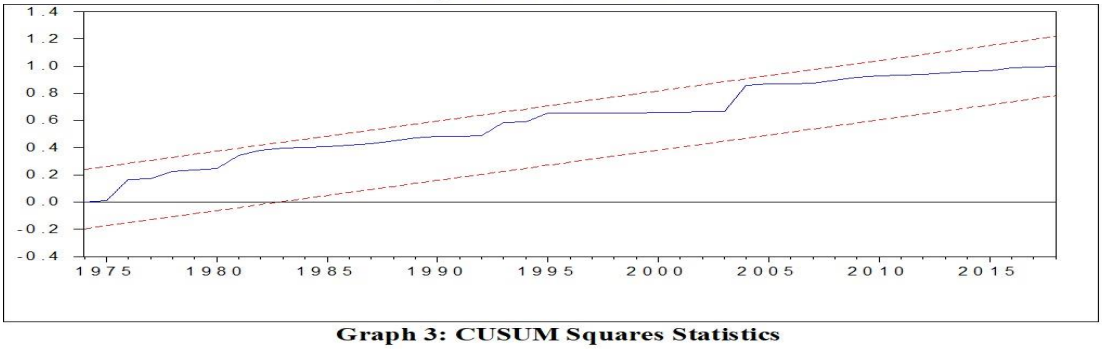
Variable	Coeffcient	Standard Error	t-value	
Constant	0.610161	4.63819	0.13155	
D(IMPORT(-1))	0.050313	0.17175	0.29294	
D(IMPORT(-2))	-0.030392	0.13792	-0.22036	
D(RER(-1))	-0.610800	1.71186	-0.35680	
D(RER(-2))	1.050814	1.75178	0.59986	
D(INFLATION(-1))	1.297951	0.96385	.34664	
D(INFLATION(-2))	2.069098	0.88138	2.34755	
D(INTEREST(-1))	-1.545688	0.50823	-3.04132	
D(INTEREST(-2))	-1.252648	0.51838	-2.41646	
	D(IMPORT)	D(RER)	D(INFLATION)	D(INTEREST)
R-squared	0.726039	0.156953	0.624462	0.185780
Adj. R-squared	0.655591	-0.059831	0.527895	-0.023591
Sum sq. resids	15061.31	138.7631	481.7480	1613.607
S.E. equation	20.74423	1.991145	3.710017	6.789923
F-statistic	10.30614	0.724008	6.466633	0.887322
Log likelihood	-194.6497	-89.18961	-117.1943	-144.3924
Akaike AIC	9.095543	4.408427	5.653080	6.861886
Schwarz SC	9.497024	4.809908	6.054561	7.263367
Mean dependent	1.186133	1.538222	-0.204178	-0.486156
S.D. dependent	35.34764	1.934126	5.399541	6.711221

Sources: Estimated (Im= Import % of GDP, Rer= Real Exchange rate, Inf= Inflation rate and Int= Interest Rate.

Table 5 representing the Error Correction Representation. From this table, it is very clear that the relationship among all those macroeconomic variables was not stable during 1976-2017. From R-squared value, it is worth saying that the data sets are relatively good for this work. Here imports expenditure can be explained properly because F-statistic is robust enough at a 5% significant level.



Graph 2: CUSUM Statistics



Graph 3: CUSUM Squares Statistics

Graph 2 and 3 are representing cumulative sum (CUSUM) and cumulative sum (CUSUM) square tests. CUSUM statistics shows that blue line crossed the red line so it can be said that out for this paper model was not stable during 1971-2018.

Findings

An import is an indispensable ingredient for a country's utmost development. An import is a good brought into an influence, particularly across a countrywide boundary from an external basis. Mostly this paper tried to show the impact of macroeconomic factors on import expenditure and the relationship of the variables. Broadly the paper shows there has a relationship between selected macroeconomic variables and import expenditure of Bangladesh. For equation 3 it can be said that the relationship between import expenditure and the real exchange rate is positive. There was a positive relationship between import expenditure and inflation rate and has a positive relationship between interest rate with import expenditure. Equation 3 suggests that, if the real exchange rate, the inflation rate, and the interest rate in Bangladesh go up when the import expenditure goes up. Accordingly, the import expenditures did not hold because of import expenditures ware highly influenced by selected macroeconomic variables during 1971-2018 in the economy of Bangladesh.

Conclusion and Recommendation

Since its independence, Bangladesh's economy has been progressing day by day. Bangladesh already successfully achieved Milliner Development Goals (MDGs) and trying to reach Sustainable Development Goals (SDGs). The export income of Bangladesh's increasing day by day that is making an enhanced economic strength as well as importing different products and services from roughly all over the world. Finally, it can be said, nowadays the overall economy of Bangladesh is glowing and performing outstandingly for its healthier macroeconomic policy and implementation. The government of Bangladesh should consistently concentrate on effective policymaking with more precisely the implementation process for attaining upcoming Sustainable Development Goals (SDGs).

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