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Research Article

Assessing the Impact of Exchange Rates on Economic Growth: An Empirical Study

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Abstract

Economic development is indiscernible for any country or any community. Global efforts are inclined towards the key objectives of achieving economic development. In this study, an attempt has been made to examine the effect of exchange rates on the economic development. This study was based on the secondary data from the year 1990 to 2019. Although panel data was used, but autoregressive distributive lag test was also employed in this study. We used ARDL approach to calculate the exchange rate. Results of the study indicated that exchange rate had statistically significant positive impact on the growth, trade, population growth, and oil prices. Moreover, the impact on the economic acceleration was also positive, implying that being the exchange rate strong more were the chances of economic development.

Keywords: Exchange Rate, Economic Growth, Oil price, ARDL.

Introduction

Following the breakdown of the "Bretton Woods" system and the system of stable exchange rates, the exchange system has gone through numerous stages. States have operated in a variety of currency rates that vary based on their economic policies; some states selected fixed exchange systems, while others picked floating exchange systems, and yet others opted for a middle ground between flotation and stability. In a time of fierce international competition and economic blocs, where the prevailing law is a competitive advantage and the ability to shocks, particularly those of economic crisis, the world has recently seen, many emerging markets and the stability and macroeconomic balance, including economic growth, have been strongly influenced, and this result waves The majority of states resorted to adopting alternative exchange rates because of the liberation fiscal and financial movements of foreign capital where the exchange rate regime was inadequate. However, they must be further enhanced by achieving more financial stability and monetary policy independence. At the same time, sustaining the stability of our currencies should not come at the price of exaggerating the exchange rate and destroying the needed pace of economic development. As a result, the problem of categorization of exchange rate systems has arisen, with a contradiction between the formal regulations stated by the state and the real laws that adopt it according to the key determinants and

economic policies implemented. The value of one currency (the local currency) in respect to another is referred to as the exchange rate (foreign currency). It may also be described as the exchange rate between one unit of a country's internal currency and any other country in the globe. Because of fluctuating factor endowment, no nation can remain isolated, according to Osiegbu and Onuorah (2011), the exchange rate plays a vital role in international economic transactions. These facts emphasize the importance of the exchange rate to the economic well-being of any country that engages in international trade in goods and services. The exchange rate's importance arises from the fact that it connects two nations' price systems, allowing for direct international trade and direct comparison of traded items. To put it another way, it bridges the gap between local and international pricing. Due to its effects on the volume of imports and exports, the currency rate has a considerable impact on a country's balance of payments.

Literature Review

Kogid et al. (2012) suggested that long-run cointegration exists between both nominal and real exchange rates and economic growth with a significant positive coefficient recorded for the real exchange rate. In addition, the results revealed that both exchange rates have a similar causal effect on economic growth. Ihnatov and Căpraru (2012) found that the currency boards may not be appropriate in a long run, but rather for short periods for macroeconomic stabilization. Further development of the research was could focus on using alternative classification schemes to show the exchange rate arrangements' effect on economic growth. According to the study of Jayachandran (2013) the exchange rate has a considerable negative influence on real exports and imports, meaning that bigger exchange rate fluctuations are likely to diminish real exports in India. Korkmaz (2013) analyzed the impact of exchange rates on economic development in France, Greece, Germany, Italy, Hungary, Spain, Poland, Turkey, and the United Kingdom. The study discovered that there is a causal relationship between exchange rate and economic development for nine European nations. Kaplan (2015) employed the dynamic least squares method (DOLS). GDP is the dependent variable, whereas the price of crude oil (OIL) or the dollar/rouble exchange rate (RUB) is the independent variable. As a result of this research, two important discoveries have been found. To begin with, structural fractures in the series have been detected, yet the series continue to travel together in the long term. Second, it has been recognized that rising oil prices are a significant element in economic development and that the rouble's depreciation versus the dollar will have a minimal impact on economic growth in the long run. Aslam (2016) revealed that the exchange rate has had a one percent considerable beneficial impact on Sri Lanka's economic development. As a result, this finding supports the hypothesis that a high exchange rate encourages a country's economic growth. Umaru et al. (2018) demonstrated a strong negative association between exchange rate volatility and economic development in four English-speaking West African nations (Nigeria, Ghana, Gambia, and Sierra Leone). These findings have significant implications for the establishment of currency rate strategies in West Africa's English-speaking countries. Muzekenyi et al. (2019). looked studied the influence of real exchange rates on economic development in South Africa from the first quarter of 1994 to the fourth quarter of 2015. The South African Reserve Bank, the South African Department of Statistics, the World Bank, and Trading Economics provided data for the study. Time-series data were

used, and the long-run connection was studied using the Augmented Dickey-Fuller and Philip Peron tests for stationarity, co-integration test, and Vector Error Correction Model (VECM) technique. Real GDP was the dependent variable, whereas Real Exchange Rates (RER), Broad Money Supply (MS), Foreign Direct Investments (FDI), Fixed Capital Formation (FCF), and Prime Interest Rate were the independent variables (INT). Exchange rates had a negative association with economic growth in the short run, but foreign direct investment had a positive relationship with economic growth. Furthermore, the VECM results demonstrate that all factors except Fixed Capital Formation had a statistically significant influence on economic development in South Africa.

Methodology

Our research is based on panel data from South Asian Economies countries just as Pakistan, China, Malaysia, and India from 1990 to 2019. The data was collected from The World Development Indicators such as exchange rate, government consumption, broad money, population growth and trade), the Reserve Bank of India (exchange rate for India), and "Crude Oil WTI Futures Historical Data" were used to compile the data (Oil Price). Instead of Economic Growth, we utilized Gross Domestic Product (GDP).

$Y = f$ (ER, GC, TRD, BM, PG, OP) ……...…….……1

Where; Y**:** GDP measured by **(**Per capital growth current us $)

ER: Exchange Rates (Unit)

BM: Broad Money (LCU)

GC: Govt consumption (Constant LCU)

TRD: Trade (%of GDP)

PG: Population Growth (Annual %)

OP; Oil Price (Unit)

The dependent variable was the Economic Growth (Y) which was explained by the movements in other variables which are BM: Broad Money, GC: Govt consumption, TRD: Trade; PG: Population Growth, OP; Oil Price, and the main explanatory variable which is Exchange Rates (ER). The econometric form of equation 1, above was then stated as follows:

$$Y = \beta_0 + \beta_1 ER + \beta_2 GC + \beta_3 TRD + \beta_4 BM + \beta_5 PG + \beta_6 OP + \mu \quad \ldots\ldots 2$$

Where, β_0 is the intercept and β_1, β_2, β_3, β_4, β_5, and β_6 are the coefficients of the explanatory variables μ denotes the error term which represents omitted variables in the specified model.

Now obtain elasticity coefficients and removing the effects of outliers, the variables of the article were transformed into logarithm form.

$$LnY = \beta_0 + \beta_1 ER + \beta_2 GC + \beta_3 TRD + \beta_4 BM + \beta_5 PG + \beta_6 OP + \mu \quad \ldots.. 3$$

Panel data are given in this chapter to demonstrate the link between dependent and independent variables. This chapter explains the approach used to look at the variables from 1990 to 2019. We'll look at the unit root to see if the data is stationary. After that, we'll talk about the ARDL technique, and finally, the error correcting model.

The equation for the long run relationship would be as follows.

$$Y = \alpha_0 + \alpha_1 \sum_{j=1}^{k} ER_{t-j} + \alpha_2 \sum_{j=0}^{k} BM_{t-j} + \alpha_3 \sum_{j=0}^{k} OP_{t-j} + \alpha_4 \sum_{j=0}^{k} TRD_{t-j} + \alpha_5 \sum_{j=0}^{k} GC_{t-j} + \alpha_6 \sum_{j=0}^{k} PG_{t-j} + \varepsilon_t$$

Table 1. Description of variables

Variable	Measurement	Source of Data	Expected sign
Economic Growth GDP	Per capita growth (current US $)	WDI	Dependent Variable
Oil Price	Unit	WTI Futures Historical Data	positive
Exchange rate	Unit	WTI Reserve bank of India	Positive
Population Growth	Annual %	WDI	positive
Broad Money	LCU	WDI	Negative
Trade	% of GDP	WDI	Negative
Govt Consumption	Constant LCU	WDI	positive

Result and Discussion

The summary statistics are presented to investigate the properties of the model's variables. The descriptive statistics for all variables are provided in Table. The sample includes Pakistan, India, China, and Malaysia, with the analytic period spanning 1990 to 2019.

Table 02. Mean values of the variables.

Variable	Mean	STD	Min	Max	Median
GDP	6.385158	3.1617	-7.35942	14.23086	6.184416
Exchange rate	103.2508	11.7031	70.52216	129.95	100.77
Population growth	1.694530	0.719330	0.455900	2.955558	1.805560
Govt. Exp.	2.03	4.38	5.84	2.30	3.94
Broad money	94.68051	46.43194	34.79942	207.6737	78.01191
Trade	70.57043	61.2447	15.502626	220.4068	39.4105
Oil price	47.70697	28.37904	14.42000	99.67000	41.51000

Descriptive Statistics described

- Mean, Standard Deviation, Minimum, Maximum and median were calculated.

Table 3. Result of ADF Test.

	At Level		At First difference	
Variables	Critical value	Table value	Critical value	Table value
GDP	-2.5874	-2.582368	-10.57438	-10.53699
	0.0984	0.2891	0.0000	0.0000
EXR	-2.866031	-2.614597	-11.00692	-11.07416
	0.0542	0.02748	0.0000	0.00000
BM	0.000400	-2.12913	-10.82001	-10.24977
	0.9561	0.5240	0.0000	0.00000
OP	-7.724177	-7.660935	-11.11002	-11.06458
	0.0000	0.00000	0.00000	0.000000
P0P	-1.26841	2.2315	-10.897	-10.85076

	0.6425	0.4676	0.00000	0.000000
TRD	-1.314636	-1.132160	-9.742089	-9.744056
	0.6212	0.9185	0.0000	0.00000
GC	-4.898155	-5.137715	- 5.754801	-5.602689
	0.001	0.0002	0.00000	0.000000

The table shows several variables are stationary at the 1st difference, such as GDP, EXR, BM, POP, and TRD, as well as OP and GC at the level.

Table 4. F Bounds test.

Test Statistic	Value	K
F-statistic	4.933765	6
Critical Value Bounds		
Significance	I_0 Bound	I_1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

We can reject the null hypothesis of no co-integration relationship based on significant F-statistics value because calculated F-statistics 4.933765 is higher than upper bound values 3.23 and lower bound values 2.12 at a level of significance of 10% when GDP is the dependent variable and all other variables are explanatory variables, as shown in the bound test results in the table above. As a consequence, we may conclude that EXR, OP, BM, GC, POP, and TRD have a long-term co-integration connection. We will now use ARDL to estimate the long-run coefficients after establishing the co-integration connection among the variables.

Table 5. Calculating the ARDL Long Run.

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AEXCAHNGE	4.256241	1.238306	3.437149	0.0008
ABROAD	-2.232372	0.945432	-2.361218	0.0200
AGOVT	1.926395	0.321703	5.988122	0.0000
AOIL	0.432402	0.251665	1.718166	0.0886
APOP	3.946634	1.147801	3.438431	0.0008
ATRADE	2.856533	0.484899	5.890988	0.0000
C	-554.879830	833.850761	-0.665443	0.5072

ARDL Approach Long Run Coefficients Estimated

Dependent variable Exchange rate

Sample: 1990-2019

The equation for a long run relationship would be as follows

$$Y = \alpha_0 + \alpha_1 \sum_{j=1}^{k} ER_{t-j} + \alpha_2 \sum_{j=0}^{k} BM_{t-j} + \alpha_3 \sum_{j=0}^{k} OP_{t-j} + \alpha_4 \sum_{j=0}^{k} TRD_{t-j} + \alpha_5 \sum_{j=0}^{k} GC_{t-j} + \alpha_6 \sum_{j=0}^{k} PG_{t-j} + \varepsilon_t$$

Discussion

In Table estimated the ARDL long-run co-integration, according this table the independent variable Exchange rate is 4.256241 and statistically not significant (Prob. 0.0008) which implies that a 1 percent increase in Exchange rate leads to a 4.2 percent increase in GDP in the long run. The positive coefficient sign shows the impact of the Exchange rate on GDP which is positive. This study is similar to the study of Chahinez and At al (2014). Broad Money is 2.232372 and statistically significant (Prob.0.0200) which implies a 1 percent increase in Broad Money which leads to a 2.2 percent decrease in GDP in the long run. The negative coefficient sign shows the impact of Broad Money on GDP which is negative. This study is similar to the study of Adusei (2013), Gatawa, Abdulgafar, and Olarinde (2017), Ehigiamusoe (2013) for Nigeria, and Ihsan and Anjum (2013) for Pakistan. Govt consumption is 1.926395 and statistically not significant (Prob. 0.0000) which implies a 1 percent increase in Govt Consumption which leads to a 1.9 percent increase in GDP in the long run. The positive coefficient sign shows the impact of Govt Consumption on GDP which is positive. The result is similar to the study of Apergis and Payne (2010), Tugcu, Ozturk, and Aslan (2012), and Salim, Hassan, and Shafiei (2014). The oil Price is 0.432402 and statistically not significant (Prob. 0.0886) which implies a 1 percent increase in the Oil price which leads to a 0.4 percent increase in GDP in the long run. The positive coefficient sign shows the impact of Oil price on GDP which is positive shows the study is similar to the results of Reporting Darl (1991) Hamilton (2008), Fattouh's (2007) report of Ibrahim and Hurst (1990), and Pesaran, Smith and Akiyama's (1998). Population Growth is 3.946634 and statistically not significant (Prob. 0.0008) which implies a 1 percent increase in Population Growth which leads to a 3.9 percent increase in GDP in the long run. The positive coefficient sign shows the impact of Population Growth on GDP which is positive. This study is similar to the study of Basu, Barik, and Arokiasamy (2013). Trade is 2.856533 and statistically not significant (Prob. 0.0000) which implies a 1 percent increase in Trade which leads to a 2.8 percent increase in GDP in the long run. The positive coefficient sign shows the impact of Trade on GDP which is positive that's revealed the same results as Harrison (1991) and Guha – Khasnobis and Bari (2001).

Conclusion

The study analyzed variables such as GDP, exchange rate, crude oil price, trade, government consumption, broad money, and population growth. The results showed that exchange rates had a positive impact on economic growth, trade, population growth, government consumption, and oil prices, while broad money had a negative effect on economic growth. The ARDL technique was used to calculate the exchange rate.

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