



## THE EFFECT OF TRADE OPENNESS ON INFLATION IN PAKISTAN

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### ABSTRACT

This study empirically verifies the existence of significant relationship between inflation and trade openness for Pakistan using annual time-series data for the period of 1980 to 2014. The basic objective of this study is to examine the Romer's hypothesis for Pakistan with real agriculture value added, real exchange rate, real gross domestic product, money & quasi money and used trade openness, import openness and export openness ratios separately as explanatory variables with inflation rate as dependent variables. For this purpose, we have used ARDL technique the expected empirical findings show that there is no long-run relationship between inflation and trade openness, which rejects the existence of Romer's hypothesis for Pakistan.

**Keywords:** Trade openness, inflation, real exchange rate, real gross domestic product

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## I. INTRODUCTION

Pakistan initially followed commercial policies that favored import substitution, which created a highly protected environment for industrialization. Tariffs, quantitative restrictions and other non-tariff barriers were the principal policy instruments used to shield the domestic import- substituting industry. However, Pakistan gradually moved towards outward-looking strategy as it reduced drastically its import tariffs, export taxes and quantitative restrictions on trade and followed prudent exchange rate policies. As a result, the process of trade liberalization has started in the country. The extent of bias against exports has declined and the share of Pakistan's trade in GDP has increased. High dependence on tariffs as a source of government revenue is the major aspect that hinders trade openness process in Pakistan. In fact, the gains from trade openness would result mostly from a lowering of trade restrictions from Pakistan's major trading partners rather than Pakistan's own commitment to trade openness. Although concerns remain about lingering tariffs, nontariff barriers, and other protectionist practices, it is hard to deny that Pakistan economy has become more liberalized. Inflation in Pakistan over the last 60 years had an erratic trend, ranging as high as 23 per cent in 1974 and as low as -3.52 per cent in 1959. Monetary factors played a dominant role in inflation creation in the country followed by food and other non-food items. Inflation was relatively low during 1980s compared to 1990s. Tight monetary policy (combined with fiscal consolidation) appears to have contributed to this low-inflation environment. Devaluation of domestic currency and political instability are held responsible for high inflation during 1990s. Trade openness and flexible exchange rate system also contributed to cosmic inflation in the country. After remaining relatively low during early 2000s, the inflation rate in Pakistan started acceleration in 2005, which is mainly because of low export growth relative to import, high oil prices, reduction in foreign capital inflows and inadequate supply of food and non-food items. Both food and non-food inflation contributed to the persistence of double-digit inflation during the period 2005-08. Table 1 reveals that during 1950s when total trade was low (23 per cent of GDP) inflation was also low (3.4 %); however, during 1990s when trade has increased to 33 per cent of GDP inflation also reaches to 9.25 per cent. A similar pattern holds between inflation and other trade openness measures i.e. Exports and imports (both expressed as percentage of GDP). This gives us the idea that inflation and trade openness remained positively correlated in Pakistan over the entire sample period.

## II. LITERATURE REVIEW

The review of literature was quite helpful to acquaint with previous related research work undertaken in the past about the impact of remittances on school enrollment in Pakistan. So, literature review of different studies has explored different results. Lotfalipour et al., (2013) tried to analyze the trade openness and inflation evidence from region countries. The paper was examine by applying an unbalanced static panel data method of estimation in the period of 1990- 2010. The result were showed that two-way fixed effects model offered a negative and statistically significant correlation among the variables that contradict the study by Romer (1993) on being a negative relationship among them within a cross-country analysis that in these countries which were mainly oil produced countries, monetary authorities should improve their knowledge of what changes the general level of prices. Zakaria (2010) tried to examine the openness trade and inflation in Pakistan. The technique was applied Generalized Method of Moments (GMM) estimation technique of Arellano and Bond (1991), and Arellano (1993) to estimate inflation equation and time-series data was use in the period of 1947 to 2007. The results showed that trade openness had a significant positive effect on inflation. An increase in the level of development of the country and a shift from pegged to floating exchange Rate regime were also predicted to add to the country's inflation rate. If rapid inflation discouraged domestic capital accumulation and if increased capital accumulation was needed for development. Salimifar et al., (2015) tried to examine a survey of the effect of trade openness size on inflation rate in Iran. The technique was applied ARDL method and *panel data* was use in the period of 1973 to 2010. The results showed that Short-term and long-term estimation model suggest that trade openness variable (without oil) had a significant negative effect on inflation, growth of liquidity and the exchange rate had positive and significant effect on inflation and the output gap had a negative effect on inflation.

Munir, Hassan and Muhammad (2015) tried to analyze the effect of trade openness on inflation in selected Asian Economies. For this purpose, Author had applied a general-to-specific model and Panel data were used for the period of 1976 to 2010. The result showed that the fixed effects and random effects estimation of the model nominal exchange rate carried a positive sign, real agriculture value added carried a significant positive sign, negative influenced of interest rate on inflation, interest rate would be effective to control inflation, money and quasi money carried a negative sign, GDP per capita growth did not show significant influenced on inflation rate.

Kurihara (2013) tried to examine international trade openness and inflation in Asia. The technique was applied GMM and fixed effects and Panel data was used in the period of 1990s to 2000. The results showed that the relationship exists both in Asia and in OEC countries however, it exists strongly in Asian recent period and there was generally a statistically significant correlation between openness of the economy and inflation both in 1990s and 2000s. The effect in Asia is stronger than the ones in OECD economies. Thomas (2012) tried to examine the Trade Openness and Inflation for the Caribbean. The technique was applied general-to-specific reduction process and panel data was used in the period of 1980 to 2009. The findings were found to be robust as they persisted for various model specifications. The empirical results did not provide support for Romer's (1993), as there was a positive relationship between trade openness and inflation.

Mukhtar (2010) tried to analyze that Does Trade Openness Reduce Inflation? The more celebrated propositions found in international trade was the case that trade liberalization was associated with declining prices, so that protectionism was inflationary. Romer's (1993) postulated the hypothesis that inflation was lower in small and open economies. The empirical findings under the co integration test showed that there was a significant negative long-run relationship between inflation and trade openness. This study further supports the results obtained by Romer's (1993), demonstrating that there was a negative relationship between openness and inflation. Aliyev and Gasimov (2014) tried to analyze openness inflation nexus in South Caucasus economies. Time series was used in the period of 1996-2012. The result showed that in Georgia and Armenia, Author found that as imports/GDP ratio increases, inflationary pressure sure decreases while assuming the influence of other factors constant, none of the coefficients were statistically significant. In Georgia, exports had an increasing and significant impact over inflation where in Armenia it was not statistically significant. Lee (2012), tried to analyze the Inflation and Residential Property Markets. In which Author used the ARDL co integration approach and classical regression approaches in the period of 32 years from 1980 to 2011. The results of actual inflation model showed that the Hong Kong small and medium size residential property provide an effective short-term hedge against actual inflation. Evans (2012), tried to analyze is openness inflationary? Policy commitment and imperfect competition. The theoretical justification for this channel was the well-known "beggar thy neighbor" incentive, and its domain celeries on a monetary authority's ability to commit to policy as well as the asymmetric effects of the underlying frictions in the model across domestic and foreign households. Samimi et al., (2012) tried to analyze that paper was to test the hypothesis first documented by Romer's (1993), that inflation was lower in more open economies. The paper's results cast substantial doubts on the conventional view that suggests a robust and negative relationship between trade openness and inflation. The estimation result regarding the traditional measure of trade openness indicates a positive and significant association between trade openness and inflation.

### III. METHODOLOGY AND DATA

Following the previous methodologies, Ali (2011), Ali (2015), Ali (2018), Ali and Bibi (2017), Ali and Ahmad (2014), Ali and Audi (2016), Ali and Audi (2018), Ali and Rehman (2015), Ali and Naeem (2017), Ali and Zulfikar (2018), Ali et al., (2016), Arshad and Ali (2016), Ashraf and Ali (2018) Haider and Ali (2015), Sajid and Ali (2018), Ali and Senturk (2019), Kassem et al, (2019) and Ali and Bibi (2020). Double log functional form is used in this paper, which means that the econometric technique was applied to data but after taking their natural log.

$$\ln INF = \beta + \beta_1 \ln GDPPC + \beta_2 \ln AVA + \beta_3 \ln ER + \beta_4 M2 - \beta_5 TO$$

GDP = Grooss domestic product

AVA = Agriculture value added (current US\$)

INF= Consumer Price Index (annual%)

ER = real effective exchange rate

M2 = Money and Quasi money (M2)(current US\$)

GDPPC= GDP per capita (current US\$)

EXP = Export(current US\$)

IMP=Import (current US\$)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ , = Coefficients

$\mu$ = disturbance term

### IV. ECONOMETRIC METHODOLOGY

Since the study use the time series data, so there is a need to check the properties of variables in the model using unit root test because most of the time series data are not stationary. Regression analysis base on time series data

assumes that the underlying data are stationary. So far empirical analysis in economics, unit root test is the prelude step, essentially in the co integration test. The test is obtained assume the existence of unit root (non-stationary) in null hypothesis and no unit root (stationary) in alternative hypothesis. The study adopt ARDL approach for co integration analysis to determine short and long run correlation among variables develop by Pesaran et.al.(2001). This technique used a long run equilibrium relationship while ECM integrates short run dynamics with long run equilibrium. It is used to investigate the long run relationship between each parts of variables it does not require pretesting of the variable included in the model for unit roots unlike other techniques such as Johnsen Cointegration approach. For the validity of bound test approaches we adopt F Statistics criteria for this we make null and alternative hypothesis. Error correction model are a category of multiple time series model that directly estimates the speeds at which a dependent variable returns to equilibrium after a change in the independent variable. It is used to check for the adjustment of the model from short run to the long run equilibrium stat then we applied ECM.

## V. RESULTS AND DISCUSSION

This chapter gives estimation results of the empirical relationship of remittances with school enrollment. The first section reviews unit root tests to stipulate the integration order of the variables incorporated in the study under consideration. The next section reviews the rationalization method (ARDL) for testing co integration. At the end, final section discusses the estimated results. Before testing the co integration among variables the order of integration among variables conducted through ADF test. The purpose to apply ADF is only to check that the variables can be used in ARDL or not. The results from following tables show that the variables are I (0) or I (1) so we can use them in ARDL estimation.

**Table 1: Unit Root Estimation (ADF Test)**

VARIABLES	At level		At first difference		
	ADF status	Prob value	ADF status	Prob value	
LINF	-2.401801	0.1488	-5.916143	0.0000	I(1)
LAVA	0.683937	0.9900	-5.477181	0.0001	I(1)
LER	-2.063770	0.2598	-4.823798	0.0004	I(1)
LM2	-0.377969	0.9020	-4.526303	0.0010	I(1)
LGDPPC	0.693206	0.9902	-5.290383	0.0001	I(1)
TO	-2.870655	0.0594	-	-	I(0)

Inflation is non stationary at level because p-value is greater than 5% at level whereas all the other selected variables, LAVA, LER LM2, LGDPPC non stationary at level because p-value is greater than 5% at level but they are stationary at 1<sup>st</sup> difference because the Probability value of each variable is less than 5 % at 1st difference and trade openness is stationary at level because p-value is less then 5 % at level. So all variables are stationery at level and first difference and no variable is stationery at 2nd difference which fulfills the assumption of ARDL Test which says no variable should be stationery at 2nd difference.and no same order of integration.

**Table 2: ARDL Bounds Testing Analysis**

F-Static	95% lower boundary	95% upper boundary	90% lower boundary	90% upper boundary
2702.779	2.62	3.79	2.26	3.35

Hence, we reject the null hypothesis which is no long run relationship between them. So, there exists the long run relationship between them.

**Table 3: Results of Estimated Long-run Coefficients Using ARDL Approach**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LGDPPC	35.155638	2.379150	14.776555	0.0430
LER	-11.140733	0.833735	-13.362440	0.0476
LAVA	-25.469512	1.869905	-13.620755	0.0467
LM2	-1.198953	0.223977	-5.353008	0.1176
TO	-30.848936	3.752638	-8.220600	0.0771

The given result shows that there is no relationship between trade openness and inflation. The findings of the present study prove that Romer's (1993) hypothesis does not hold for Pakistan. It means that trade openness is not a basic reason for high inflation for Pakistan. The coefficient of GDP per capita carries a positive sign at 5 percent level and shows that 1 percent increase in GDP per capita brings about 35.155638 increases in inflation rate. The coefficient of exchange rate carries a negative sign at 5 percent level and shows that 1 percent increase in exchange rate decrease -11.140733 in inflation rate. The coefficient of real agriculture value added carries a significant negative sign at 5 percent level of significance and shows that a 1 percent increase in real agriculture value added brings about -25.469512. Decrease in inflation rate. The coefficient of money and quasi money carries a negative sign and statistically significant at 1 percent level of significance, which shows that a 1 percent increase in money and quasi money brings about -1.198953 percent decrease in inflation rate. The coefficient of trade openness carries a negative sign and statistically significant at 1 percent level of significance, which shows that a 1 percent increase in trade openness brings about -30.848936 decrease in inflation rate.

**TABLE 4: Estimated Short Run Model ECM**

Variables	Coefficient	t-Statistic	Prob.
D(INF(-1))	-0.435154	-18.201959	0.0349
D(LGDPPC)	-1.429517	-4.979423	0.1262
D(LER)	2.499981	43.261749	0.0147
LAVA	0.311294	-13.620755	0.4144
D(LM2)	-5.719833	-64.531371	0.0099
D(TO)	1.985408	11.046398	0.0575

The error correction term is statistically significant with a negative sign. It shows the speed of Adjustment from Short to Long Run equilibrium. The results show that the value of ECM is -0.418822 which shows about 41% of disequilibrium convert into equilibrium during given time period.

## VI. CONCLUSIONS

The present study tests the existence of Romer's hypothesis in Pakistan by combining the determinants of inflation from inflation-trade openness literature and determinants of inflation from inflation modeling literature using encompassing principle. The results show that there exists no significant relationship between inflation and trade openness in Pakistan in the given time period which reject the Romer's hypothesis for Pakistan. Since there are many factors affecting inflation, trade openness becomes insignificant when some of the channels through which inflation is affected are included in the model. The hypothesis that trade-openness negatively affect inflation is rejected in favor of no effect of trade openness on inflation.

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