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How do Financial Development and Petroleum Prices Cause Trade Openness in Pakistan?

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Abstract

In the past, financial development and petroleum prices were identified as crucial factors influencing economic growth. This induced the researcher to explore how financial development and petroleum prices influence trade openness in Pakistan. The yearly data is collected for the period 1980-2016 to apply the ARDL co-integration method. The results reflected the presence of long-term co-integration between trade openness and its various factors. This suggests that with the rise in the availability of credit in the private sector there is an eventual impact on imports and exports. Moreover, international petroleum prices also impact the same by pushing up the prices of goods. Hence, it is recommended that hedging the oil prices and the expansion of credit in Pakistan is worthwhile in terms of trade openness.

Keywords: financial development, trade openness, world oil prices

JEL classification: F43; O13; C22

Introduction

Trade openness is among the main factors which help an economy to grow. Two main benefits of trade openness include: 1) generating employment opportunities not just within an economy, but also outside the economy and 2) economic efficiency.

There are many factors worldwide that can affect the trade openness of an economy, directly and indirectly, depending upon the events. However, a major factor is "petroleum prices". There are many factors that influence petroleum prices, such as its demand and supply. Hence, it can be speculated that petroleum prices and trade openness are directly proportional to each other. This is because of the fact that when trade increases between economies more petroleum is needed for the increasing number of shipments (of goods). If demand increases, then additional supply results in an increase in the price of crude oil. Trade openness is not the only factor influencing petroleum prices. Indeed, there are several other factors including households, personal conveyance, electricity producing units and many others.

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Credit lending to the corporate sector is also responsible for the trade openness in an economy. When there is more credit lending in the market, it affects trade positively. Thus, every country needs to develop good financial markets, so that they can enhance trade liberalization. Kletzer and Bardhan (1987) showed positive effects of trade openness on economies that have an improved financial system. This shows that financial development is important for industrial leverage and helps it to boost the economy.

In this paper, it is explored that how petroleum prices and financial development in Pakistan affect trade openness. Pakistan is a fast-growing economy and it needs to be determined that how it can be improved. Pakistani financial sector is among the famous financial sectors in the world, so the aim is to evaluate how this financial system affects the trade openness of the country. Wolde-Rufael (2009) finds a bi-directional causality between financial development and trade openness in the case of Kenya. Also, the influence of change in petroleum prices is evaluated in terms of the trade openness in Pakistan. Coes (1994) states that imports fell by over $5 billion in Brazil during 1982 and 1984 and some of this decline was due to the fall in petroleum prices from their record levels.

Research Questions

- What are the effects of financial development on trade openness in Pakistan?
- What are the effects of international petroleum price changes on the trade openness in Pakistan?

Contribution

This paper deals with the effects of financial development and petroleum price changes on trade openness in Pakistan. The aim is to identify trade behaviors keeping in view new credit policies formulated by the State Bank of Pakistan as well as the predictions of international petroleum prices.

Literature Review

Financial development is imperative for industries to survive; especially, when they are involved in trade. There may be several determinants of financial development. However, the study focuses on the availability of credit to the private sector of Pakistan's economy. Kim et al. (2010) show a positive long-run relationship between financial development and trade openness. On the other hand, they find a negative relationship between both variables in the short-run. This shows that the financial system of a country affects trade.

Apart from trade and technology, innovation is also another main factor affecting the growth of the economy. Innovation causes a variety of goods to flow in the economy that caters to the domestic demand and also leads to the export of surplus production. Pakistan and other developing countries import technology for economic stability, which again depends on trade liberalization. Cole (2006) states that trade openness is the way to exchange technology between developed and developing economies.

Maryam and Hassan (2013) study the impact of human capital in the form of GDP per capita on trade openness and concluded that there is a positive relationship between the two variables. It shows that efficient allocation of human capital can affect trade openness, both positively and negatively. This study also incorporates the factor of economic growth as a control variable to assess the influence of financial development and petroleum prices on trade openness.

Beck (2002) analyzes financial development and trade using 30-year panel data for 65 countries and concludes that financial development has a great causal effect on trade openness and trade balances of a country. The yearly data of Pakistan is used to record the sensitivity of trade openness. Blackburn and Hung (1998) study the impact of financial development and trade on economic growth and find that only trade has a significant positive relationship with the growth of a country's economy.

Rajan and Zingales (2003) conduct a study on cross-border trade and financial system development of economies. The results suggest that financial development correlates positively with trade openness. However, when capital flows were low the correlation between the two variables was also very low, which points towards the importance of capital in terms of trade openness. Hence, an attempt is being made to assess the relevance of this finding for developing countries.

China is among the biggest economies experiencing a near continuous economic boom. Companies in China are divided into two categories comprising state-owned and privately-owned companies. Ge and Qiu (2007) study the type of firms that consume more trade credit and conclude that privately-owned firms consume more trade credit as compared to state-owned firms. The current study shows the importance of the financial system. It focuses on the financial system because mostly, the private sector firms in Pakistan are mainly centered on trade credits when it comes to trade in the private sector. So, in terms of financial development, this study focuses on the credit allotted to the private sector and how it impacts trade openness.

Shahbaz et al. ([2013](#)) calculate the effect of energy consumption, financial development, capital, export, and imports on the dependent variable, that is, the economic growth of China. They show that all independent variables affect economic growth positively. Again, the current study also demonstrates that financial development is very important and has a positive effect on the economic growth of a country.

Methodology

The times series data for the domestic credit to the private sector, GDP per capita, government education expenditure and the real effective exchange rate for the years 1980 – 2016 are collected from the world development indicators (WDI, [n.d](#).) in local currency units for Pakistan. Whereas, the data of world oil prices for the same period is obtained from US energy information administration (EIA, [n.d](#).).

Theoretical Framework

The financial development of Pakistan is measured using a proxy variable, that is, domestic credit to the private sector. This is the independent variable as it represents the allocation of budget by the government of Pakistan in order to increase the capital flow in the economy which leads to trade. In a previous study, credit to private sector is used as a proxy variable for financial development, carried out by Beck ([2002](#)) and domestic credit to the private sector was incorporated as the indicator of financial development.

Trade openness (which itself accounts for imports and exports) has a significant relationship with international oil prices due to its global impact. In this study, world oil prices are used as a proxy for petroleum prices to estimate the relationship with trade openness. The selection of independent variable is in contrast to Sadorsky ([2011](#)), who studies trade and energy consumption in the Middle East.

Economic growth and trade openness is a well-known topic and has been researched by countless scholars in the past. Keeping in view the literature and the study of Yanikkaya ([2003](#)), GDP per capita is used as a proxy for economic growth which is a control variable in this study.

Another control variable of this study is real effective exchange rate. This show "the variation in value of domestic currency against the weighted average of other traders belonging to the home country" (Hassan et al., [2017](#)).

Human capital is also used as a control variable estimated by the proxy of government expenditure on education, as increased educational expenditure leads to improvement in the literacy rate leading to more human capital in the economy.

This variable is specifically used because government spending on education is an important policy for developing economies, such as Pakistan (Deger, 1985).

Moreover, trade openness is the dependent variable, calculated by adding imports and exports as the percentage of GDP.

Table 1

Variable Description

Variable	Proxy	Transformation	Indicator
Trade Openness	Imports + Exports	Ln (Imports + Exports)/GDP	lnTOP
Financial Development	Domestic Credit to the Private Sector	Ln (Domestic Credit to the Private Sector)	lnDCPS
Petroleum Price	World Oil Prices	Ln (World Oil Prices)	lnWOP
Economic Growth	GDP per capita	Ln (GDP per capita)	lnGDPPC
Exchange Rate	Real Effective Exchange Rate	Ln (Real Effective Exchange Rate)	lnREER
Human Capital	Government Expenditure on Education	Ln (Government Expenditure on Education)	lnGEE

The following hypotheses are devised for this study:

$H_0 = b_1 = b_2 = b_3 = b_4 = b_5$ (Co-integration does not exist in the long-run)
$H_1 = b_1 \neq b_2 \neq b_3 \neq b_4 \neq b_5$ (Co-integration exists in long-run)

The conceptual model that is devised to test the hypotheses is as follows:

$$lnTOP = b_0 + b_1 lnDCPS + b_2 lnWOP + b_3 lnGDPPC + \mu_1$$
$$lnTOP = b_0 + b_1 lnDCPS + b_2 lnWOP + b_3 lnGDPPC + b_4 lnREER + \mu_1$$
$$lnTOP = b_0 + b_1 lnDCPS + b_2 lnWOP + b_3 lnGDPPC + b_4 lnREER + b_5 lnGEE + \mu_1$$

Strategy of Estimation

In order to derive factual findings using the time series data; initially, descriptive statistics are applied to demonstrate the distribution of variables. Then, the coefficient of correlation is calculated which is further used to calculate the variance inflation factor (VIF) to check multicollinearity. The order of integration is assessed using the unit root test of stationarity. The testing approach of ARDL bounds is used to identify the linkages between trade openness and its various factors. As mentioned above, three functional forms are tested to reflect the changes

in the results with the increase in control variables which allows the robustness check related to this study. Moreover, the long-run and short-run coefficients are also estimated to indicate the impact of the various factors during the said time period.

Firstly, descriptive statistics are calculated to show the distribution of variables. Then, the coefficient of correlation is calculated which is further used to calculate the VIF to check multicollinearity. The order of integration is identified using KPSS and Ng-Perron test of unit root. Lag length criteria are also reflected and Johansen co-integration approach is used to estimate the results.

Analysis and Results

Table 1 shows the descriptive statistics which are under dispersed as the mean values of all variables are greater than the values of their respective standard deviation. The total number of observations in this study is 37 which is more than 30 as per the central limit theorem.

Table 2

Descriptive Statistics

	LNTOP	LNDCPS	LNWOP	LNGDPPC	LNREER	LNGEE
Mean	2.861949	3.149912	36.87649	10.67187	4.801991	0.903048
Median	2.861967	3.187099	25.88000	10.66801	4.733121	0.942578
Maximum	2.881545	3.394041	95.99000	11.01559	5.434360	1.175777
Minimum	2.838848	2.733463	10.87000	10.26467	4.540987	0.608025
Std. Dev.	0.012204	0.178553	27.66043	0.207095	0.266298	0.134061
Skewness	-0.107372	-1.062387	1.138360	-0.179864	1.182272	-0.424395
Kurtosis	1.844239	3.290251	2.888996	2.062904	3.114159	2.541422
Jarque-Bera	2.130426	7.089988	8.010158	1.553311	8.639648	1.434887
Probability	0.344654	0.028869	0.018223	0.459942	0.013302	0.487998
Sum	105.8921	116.5468	1364.430	394.8594	177.6737	33.41277
Sum Sq. Dev.	0.005361	1.147724	27543.59	1.543983	2.552930	0.647009
Observations	37	37	37	37	37	37

Table 3 depicts the coefficient of correlation of all variables used to test multicollinearity by computing the VIF.

Table 3

Coefficient of Correlation

	LNTOP	LNDCPS	LNWOP	LNGDPPC	LNREER	LNGEE
LNTOP	1	-0.33619	0.707954	0.907622	-0.79281	0.247589
LNDCPS	-0.33619	1	-0.4774	-0.5256	0.188369	0.048969
LNWOP	0.707954	-0.4774	1	0.687877	-0.36383	-0.18235
LNGDPPC	0.907622	-0.5256	0.687877	1	-0.81243	0.259013
LNREER	-0.79281	0.188369	-0.36383	-0.81243	1	-0.39022
LNGEE	0.247589	0.048969	-0.18235	0.259013	-0.39022	1

VIF depicted in Table 4 shows no evidence of multicollinearity as the calculated VIF values are less than 10 of independent and dependent variables.

Table 4

VIF

	LNTOP	LNDCPS	LNWOP	LNGDPPC	LNREER	LNGEE
LNTOP	#DIV/0!	1.12743	2.00481	5.67463	2.69213	1.0653
LNDCPS	1.12743	#DIV/0!	1.29519	1.3817	1.03679	1.0024
LNWOP	2.00481	1.29519	#DIV/0!	1.89816	1.15256	1.0344
LNGDPPC	5.67463	1.3817	1.89816	#DIV/0!	2.94157	1.07191
LNREER	2.69213	1.03679	1.15256	2.94157	#DIV/0!	1.17962
LNGEE	1.0653	1.0024	1.0344	1.07191	1.17962	#DIV/0!

It is important to know the stationarity of variables in order to apply the appropriate co-integration test. Table 5 reflects the values of the unit root test calculated using KPSS. As per KPSS' null hypothesis, the variables are stationary. The results reflect that trade openness, financial development, petroleum prices, economic growth and exchange rate are non-stationary at level, whereas human capital is stationary at level. Furthermore, trade openness, financial development, petroleum prices, and economic growth turned out to be stationary, leaving the exchange rate non-stationary at first difference. The unit root test results using Ng-

Perron is also depicted in Table 5. Ng-Perron's null hypothesis suggests the evidence of unit root in the series. The calculated values show that trade openness, petroleum prices, economic growth and exchange rate are non-stationary at level and remained non-stationary at first difference, except for economic growth.

Table 5

Unit Root Test

Variable	at level KPSS test	Variable	At first difference KPSS test
LNTOP	0.642326	DLNTOP	0.072967
LNDCPS	0.390316	DLNDCPS	0.177693
LNWOP	0.47705	DLNWOP	0.119279
LNGDPPC	0.727984	DLNGDPPC	0.157619
LNREER	0.532651	DLNREER	0.482712
LNGEE	0.219667	DLNGEE	0.21289
Critical values		1% level	0.739
		5% level	0.463
		10% level	0.347
Variable	at level Ng-Perron test	Variable	At first difference Ng-Perron test
LNTOP	-2.07864	DLNTOP	-2.63559
LNDCPS	-5.78394	DLNDCPS	-16.3821
LNWOP	-3.49388	DLNWOP	-17.3676
LNGDPPC	0.85835	DLNGDPPC	-12.3246
LNREER	-0.46967	DLNREER	-5.68534
LNGEE	-12.2587	DLNGEE	-17.3538
Critical values		1% level	-13.8
		5% level	-8.1
		10% level	-5.7

Model 1: $lnTOP = b_0 + b_1 lnDCPS + b_2 lnWOP + b_3 lnGDPPC + \mu_1$

Three individual models are tested to record the changes in their co-integration dynamics. Model 1 is used to estimate the effect of financial development, petroleum prices and economic growth on trade openness in Pakistan. Table 6 shows that the derived F-statistics and W-statistics values are 6.2011 and 24.8043, respectively. These values are larger as compared to 5% and 10% critical values which allow us to conclude that there is co-integration of financial development, petroleum prices and economic growth with trade openness in Pakistan. Hence, rejecting the null hypothesis of no co-integration.

Keeping in view the diagnostic test results of Model 1, it is confidently proposed that serial correlation is not an issue, functional form is not specified incorrectly as the probability value is insignificant considering the F version, error term seems to be normally distributed and there is no issue of heteroskedasticity. So, it won't be wrong to suggest that Model 1 is reliable for Pakistan.

Table 6

Model 1 – ARDL Results

Model	lnTOP = f (lnDCPS, lnWOP, lnGDPPC)			
Optimal lag	(1,1,0,1)			
F Statistics	6.2011			
W statistics	24.8043			
	'Critical bound for F-statistics'		'Critical bound for W-statistics'	
Significance	'Lower Critical Bound'	'Upper Critical Bound'	'Lower Critical Bound'	'Upper Critical Bound'
5 Percent	3.6288	4.8751	14.5153	19.5004
10 Percent	2.9699	4.0864	11.8796	16.3458
Diagnostic Tests				
R-square	.92776	Serial Correlation	2.6256[.105]	
Adjusted R square	.91282	Functional Form	2.4421[.129]	
P- value F-statistics	[.000]	Normality	1.1824[.554]	
F-statistics	62.0769	Heteroskedasticity	.93024[.335]	
DW-statistic	1.6380	Durbin's h-statistic	2.3272[.020]	

Table 7 indicates the computed long-run and short-run coefficients as per Model 1. Financial development, petroleum prices and economic growth demonstrate a positive and significant relationship with trade openness in Pakistan. However, in the short-run, a positive and significant relationship of financial development with trade openness is recorded. The ecm(-1) value is also negative and significant. The speed of adjustment in terms of Model 1 is 77% and in case of disequilibrium

considering the ARDL model, it will take (1/0.77278) 1.3 years to regain equilibrium.

Table 7

Model 1 – Long-term and Short-term Coefficients

ESTIMATED LONG-TERM COEFFICIENTS			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
lnDCPS	.019930	.0056140	3.5500[.001]
lnWOP	.7336E-4	.4136E-4	1.7736[.087]
lnGDPPC	.060269	.0062159	9.6959[.000]
C	2.1546	.074270	29.0102[.000]
ERROR CORRECTION REPRESENTATION FOR THE ARDL MODEL			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
lnDCPS	.022985	.0091113	2.5227[.017]
lnWOP	.5669E-4	.3500E-4	1.6195[.115]
lnGDPPC	-.0093825	.039987	-.23464[.816]
ecm(-1)	-.77278	.14741	-5.2426[.000]

Significance Level	Critical Bound for F-statistics		Critical Bound for W-statistics	
	Lower Critical Bound	Upper Critical Bound	Lower Critical Bound	Upper Critical Bound
5 Percent	3.6288	4.8751	14.5153	19.5004
10 Percent	2.9699	4.0864	11.8796	16.3458

Model 2: $lnTOP = b_0 + b_1 lnDCPS + b_2 lnWOP + b_3 lnGDPPC + b_4 lnREER + \mu_1$

The second model adds the exchange rate variable to test the changes in trade openness and other determinants. Table 8 indicates the co-integration results of financial development, petroleum prices, economic growth and real effective exchange rate with trade openness in Pakistan. The computed F-statistics and W-statistics values are 4.0879 and 20.4394, respectively. These values are larger than the 10% critical value. This suggests the existence of co-integration between trade openness and its determinants in the case of Pakistan.

The diagnostic tests applied in Model 2 show no issue of serial correlation, error term and heteroskedasticity.

Table 8

Model 2 – ARDL Results

ARDL Bound Testing Approach				
Model	lnTOP = f (lnDCPS, lnWOP, lnGDPPC, lnREER)			
Optimal lag	(1,0,0,0,0)			
F-Statistics	4.0879			
W-statistics	20.4394			
	'Critical Bound for F-statistics'		'Critical Bound for W-statistics'	
Significance level	'Lower Critical Bound'	'Upper Critical Bound'	'Lower Critical Bound'	'Upper Critical Bound'
5 Percent	3.2822	4.5633	16.4109	22.8164
10 Percent	2.7040	3.8670	13.5200	19.3349
Diagnostic Tests				
R-square	.92701	Serial Correlation		1.8025[.179]
Adjusted R square	.91484	Functional Form		2.4421[.129]
P- value F-statistics	[.000]	Normality		.17031[.918]
F-statistics	76.1992	Heteroskedasticity		.026366[.871]
DW-statistic	1.6945	Durbin's h-statistic		1.6724[.094]

The long-run and short-run coefficients of Model 2 are reflected in Table 9, which shows the positive and significant relationship of financial development, petroleum prices and economic growth with trade openness in the case of Pakistan. The ecm(-1) value is also negative and significant. The speed of adjustment in terms of Model 2 is 73% and in case of disequilibrium keeping in view the ARDL model, it will take (1/0.73143) 1.4 years to regain equilibrium.

Table 9

Model 2 – Long-term and Short-term Coefficients

ESTIMATED LONG-TERM COEFFICIENTS			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
lnDCPS	.016765	.0063255	2.6504[.013]
lnWOP	.8996E-4	.4674E-4	1.9249[.064]
lnGDPPC	.047952	.012041	3.9826[.000]
lnREER	-.0090927	.0068005	-1.3371[.191]
C	2.3375	.16758	13.9489[.000]
ERROR CORRECTION REPRESENTATION FOR THE ARDL MODEL			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
lnDCPS	.012262	.0048911	2.5071[.018]
lnWOP	.6580E-4	.3705E-4	1.7762[.086]
lnGDPPC	.035074	.011257	3.1158[.004]
lnREER	-.0066507	.0048876	-1.3607[.184]
ecm(-1)	-.73143	.13941	-5.2466[.000]

Significance Level	Critical Bound for F-statistics		Critical Bound for W-statistics	
	Lower Critical Bound	Upper Critical Bound	Lower Critical Bound	Upper Critical Bound
5 Percent	3.2822	4.5633	16.4109	22.8164
10 Percent	2.7040	3.8670	13.5200	19.3349

Model 3: $lnTOP = b_0 + b_1 lnDCPS + b_2 lnWOP + b_3 lnGDPPC + b_4 lnREER + b_5 lnGEE + \mu_1$

The third and final model accounts for human capital. It aims to evaluate the combined co-integration of other determinants with trade openness in Pakistan. Table 10 shows the ARDL bound results of financial development, petroleum prices, economic growth, real effective exchange rate and human capital on trade openness. The F-statistics and W-statistics values are 4.2578 and 25.5467, respectively. They exceed the 10% critical value; hence, rejecting the null hypothesis of no co-integration between trade openness and its determinants.

Model 3 clears the diagnostic test. There is no issue of serial correlation, functional form is also not specified incorrectly, there is normal distribution of error term and no issue of heteroskedasticity. Hence, Model 3 is suitable in the case of Pakistan.

Table 10

Model 3 – ARDL Results

ARDL Bound Testing Approach			
Model	lnTOP = f (lnDCPS, lnWOP, lnGDPPC, lnREER, lnGEE)		
Optimal lag	(1,0,0,0,1,1)		
F-Statistics	4.2578		
W-statistics	25.5467		
	'Critical bound for F-statistics'		'Critical bound for W-statistics'	
Significance level	'Lower Critical Bound'	'Upper Critical Bound'	'Lower Critical Bound'	'Upper Critical Bound'
5 Percent	3.0647	4.3919	18.3884	26.3515
10 Percent	2.5355	3.7211	15.2129	22.3266
Diagnostic Tests			
R-square	.94465	Serial Correlation	.93393[.334]
Adjusted R square	.92825	Functional Form	1.4807[.224]
P- value F-statistics	[.000]	Normality	1.7005[.427]
F-statistics	57.6023	Heteroskedasticity	.18845[.664]
DW-statistic	1.7689	Durbin's h-statistic	1.7599[.078]

Following the diagnostic results, the long-run and short-run coefficients are displayed in Table 11. With Model 3, the negative relationship of the real effective exchange rate with trade openness turned out to be significant. Moreover, the financial development, petroleum prices, economic growth and real effective exchange rate have a significant relationship with trade openness in Pakistan. Human capital has an insignificant relationship with trade openness in the long-run, but is positively and significantly related with it in the short-run. In the short-run, financial development, economic growth and human capital have a significant relationship with trade openness. Also, the value of ecm(-1) is negative and

significant. The economy will take (1/0.81487) 1.2 years to regain equilibrium in case of shock with 81% rate of adjustment using the selected ARDL model.
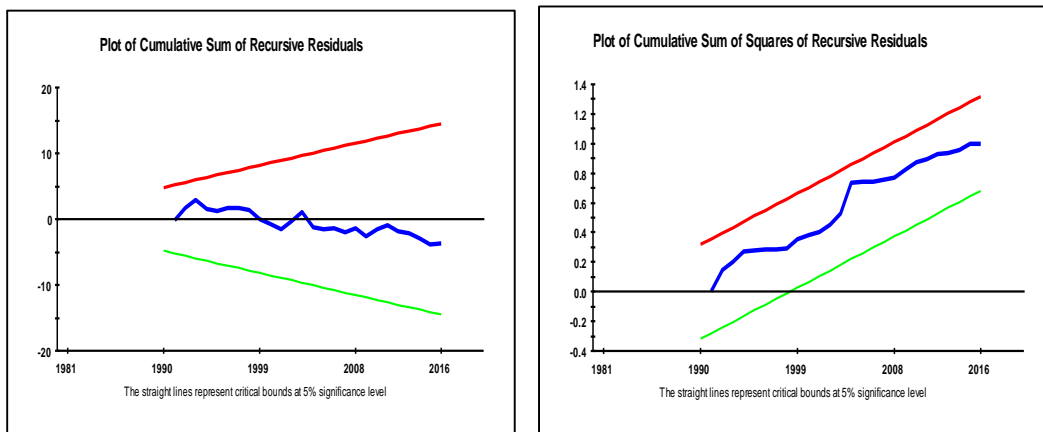
Table 11

Model 3 – Long and Short-term Coefficients

ESTIMATED LONG-TERM COEFFICIENTS			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
lnDCPS	.019137	.0054258	3.5270[.002]
lnWOP	.8394E-4	.4693E-4	1.7888[.085]
lnGDPPC	.043698	.010970	3.9835[.000]
lnREER	-.012067	.0058406	-2.0660[.049]
lnGEE	-.0031685	.0086917	-.36454[.718]
C	2.3930	.14486	16.5192[.000]
ERROR CORRECTION REPRESENTATION FOR THE ARDL MODEL			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
lnDCPS	.015594	.0048475	3.5270[.002]
lnWOP	.6840E-4	.4693E-4	1.7888[.085]
lnGDPPC	.035608	.010970	3.9835[.000]
lnREER	.013188	.0058406	-2.0660[.049]
lnGEE	.0098557	.0086917	1.7753[.086]]
ecm(-1)	-.81487	.14486	-5.3192[.000]

Significance Level	Critical Bound for F-statistics		Critical Bound for W-statistics	
	Lower Critical Bound	Upper Critical Bound	Lower Critical Bound	Upper Critical Bound
5 Percent	3.0647	4.4	18.3884	26.3515
10 Percent	2.5355	3.7	15.2129	22.3266

CUSUM and CUSUM square is graphically represented to test the stability of long-run and short-run coefficients. As can be seen from Figure 1, the error term's mean and variance is within the critical bounds. Thus, the short-run and long-run coefficients using the sample for the years 1980-2016 are structurally stable and there is no existence of structural breakdown.

Figure 1

Stability Test

Table 12

Granger Causality Test

Variable	lnTOP	lnDCPS	lnWOP	lnGDPPC	lnREER	lnGEE
lnTOP	NA	0.00493 (0.9445)	0.26038 (0.6133)	12.1651 (0.0014)	8.69231 (0.0058)	0.78522 (0.3820)
lnDCPS	2.52800 (0.1214)	NA	9.93089 (0.0034)	4.35164 (0.0448)	2.44707 (0.1273)	0.02343 (0.8793)
lnWOP	3.37751 (0.0751)	1.49132 (0.2307)	NA	1.14218 (0.2929)	1.74362 (0.1958)	0.35300 (0.5565)
lnGDPPC	0.01060 (0.9186)	0.38718 (0.5381)	0.47679 (0.4947)	NA	0.57817 (0.4524)	0.85678 (0.3614)
lnREER	4.88283 (0.0342)	5.76378 (0.0222)	3.33276 (0.0770)	1.68829 (0.2028)	NA	0.95588 (0.3353)
lnGEE	0.28828 (0.5949)	0.02242 (0.8819)	5.8E-05 (0.9940)	0.65946 (0.4226)	0.52479 (0.4739)	NA

Compiling the results, it is worth noticing that financial development, petroleum prices, economic growth, real effective exchange rate and human capital are cointegrated with trade openness in Pakistan. Surprisingly, it is worth noticing that human capital positively influences trade openness in the short-run but has an insignificant effect in the long-run. The real effective exchange rate has a negative relationship with trade openness which means that as exchange rate rises, it

negatively affects the economy of Pakistan. Hence, it also negatively affects the imports and exports of the country.

Moreover, an increase in oil prices leads to the rising cost of products in the international market, so it becomes an incentive for Pakistan to increase exports due to which trade openness also increases. Hence, an increase in financial development and economic growth leads to enhanced trade openness. More credit to the private sector would lead to more investment opportunities, leading to a rise in imports of capital goods and a resultant increase in the exports of finished goods.

Also, the results confirm the direct connection between economic growth and trade openness. With the rise in income level and the number of finished goods in the economy, the standard of living also rises. It leads to people moving towards more imported goods and investment opportunities within the economy. Investment opportunities may lead to more production and also provide an option to export the surplus production.

Thus, the findings suggest that financial development, petroleum prices and economic growth have a robust affect on trade openness in the long-run, keeping in view the results of all three models of this study. Also, financial development and economic growth have a robust relationship with trade openness in the short-run.

Conclusion and Recommendations

The study aimed to assess the impact of financial development and petroleum prices on trade openness in Pakistan. Initially, economic growth is incorporated as a control variable. Then, real effective exchange rate and human capital are also added as control variables. Then, we also added real effective exchange rate and human capital as control variables. In order to accomplish the objective of this study, descriptive statistics and the multicollinearity test are used to understand the nature of variables. The order of integration related to the variables is assessed using KPSS and Ng-Perron unit root tests. ARDL co-integration test is employed to find out the existence of long-term co-integration between trade openness and its determinants, through the demonstration of long-run and short-run coefficients. CUSUM and CUSUM square are graphically depicted to show the stability of coefficients and causality's direction is assessed through the designated variables using Granger causality test.

Financial development is measured using domestic credit to the private sector, petroleum prices are measured using world oil prices, human capital is measured using government expenditure on education and trade openness is cumulative of

imports and exports. Summarizing the results, it is noted that financial development and petroleum prices do lead to trade openness in the case of Pakistan. This is because as more credit is available to the private sector, more companies are in the position to invest in physical and human capital. It causes the circular flow of income in the economy that eventually leads to the import of capital goods and the export of finished goods. Also, international oil prices have a global impact via the rise in the prices of raw materials as well as finished goods. This causes a surge in the prices of Pakistan's agricultural, textile and sports goods in the international market, leading to an incentive to produce and export more. Moreover, human capital is also a contributing factor that leads to trade openness in the case of Pakistan in the short-run, while economic growth is a consistent contributor towards trade openness in both short-run and long-run. These findings are based on the coefficients which remained structurally stable when tested by the stability test and were robust in terms of financial development, petroleum prices and economic growth as tested using the three models.

Based on the findings, it is recommended here that the sources of lending in Pakistan must be adequate to cover the needs of the private sector with some leniency in the procedure of lending. The derivative institutions must be encouraged by the government and it may lead to a safer lending approach for financial institutions with the option to hedge the adverse effects of the international oil prices and real effective exchange rate. Trade openness also influences real effective exchange rate and petroleum prices as suggested by Granger causality test (results are depicted in Table 12). The way an economy is involved in imports or exports impacts the exchange rate and petroleum prices, simultaneously. This may eventually lead to economic growth due to the flow of money in the economy which positively influences the imports and exports of the country.

Since this study focused on the Pakistani economy only, a comparison with other developing countries would be helpful to prove the relationship across the board. Also, remittances have an impact on trade openness which can be incorporated as a mediating factor between financial development and trade openness.

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