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Financial Development, International Trade and Economic Growth: Empirical Evidence from Pakistan

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ABSTRACT

The study utilizes the Autoregressive-distributed lag (ARDL) approach for cointegration and Granger causality test, to explore the long run equilibrium relationship and the possible direction of causality between international trade, financial development and economic growth for the Pakistan economy. Imports plus exports of goods and services is used as a proxy for international trade, while broad money (M2) and gross domestic product (GDP) are used as the proxies for financial development and economic growth, respectively. Result explores a long run relationship between the variables. In case of Pakistan, economy supply leading hypothesis is accepted. Moreover, unidirectional causality is observed from international trade to economic growth and from financial development to international trade.

Keywords: Financial development, international trade, economic growth, Pakistan

JEL codes: F4, F13, G18, F02

1. Introduction

Investigation of major determinants of economic growth is one of the main issues of development economics. In early literature of development economic, economist relatively paid little attention towards the role of financial development and international trade in economic growth. Development in financial sector is considered as one of the key determinant of financial

liberalization. It is considered as the essence of financial liberalization process. Gurley & Shaw (1955, 1967) and Goldsmith (1969) explored the importance of financial development in economic growth. The seminal debate on this subject can be marked out to Schumpeter (1911) who argued that financial development leads to economic growth. After this a flood of studies has been emerged¹ on this issue. Calderon and Liu (2003) considered that financial development is necessary condition for economic growth. But here the question arises that does financial development cause economic growth or does economic growth cause financial development? In literature, to find out the causality between financial development and economic growth, there are two hypotheses, developed by Patrick (1966). One is the supply-leading hypothesis (SLH) and the other is demand-following hypothesis (DFH). SLH posited a possible causality from financial development (FD) to Economic growth (EG) and vice versa for DFH. Some studies give support to SLH², while some support to DFH³. Now come towards the second argument that International trade is also one of the important determinants of economic growth (Chow, 1987; Xu, 1996; Balaguer and Cantuella-Jorda, 2002; Kletzer and Bardha, 1987) conclude that financial development gives comparative advantage to industrial sector of that country. Hence, financial development and international trade are highly correlated with economic growth.

The purpose of this study is to find out the possible cointegration and causal relationship between international trade, financial development and economic growth in Pakistan economy for the period of 1973-2009. The findings of this study will help the policy makers, whether they should follow financial development or they should follow economic growth, or whether follow both financial development and economic growth at the same time.

Rest study is organized as follows: section two discusses about the data and methodology; section three presents the results and last section gives the conclusion and policy implication.

2. Data and Methodology

Time series annual data for the period of 1973-2009 is used. Data on real imports of goods and services, real imports of goods and services, real gross domestic product, real domestic credit provided by banks and real M2, are gathered from IFS CD-Rom 2009. All the variables are treated in real terms. Augmented Dicky Fuller (ADF) and Phillips Perron (PP) unit root tests are employed in order to check the stationarity of the variables. To explore the long run relationship between variables, bonds test for cointegration under ARDL approach is used. Pesaran and Shin (1996); Pesaran and Pesaran (1997); Pesaran and Smith (1998); and Pesaran et al. (2001) introduced this technique to test the cointegration among variables. The main feature of this

¹ Patrick (1966), Katkhate (1988, 1972), Shaw (1973), McKinnon (1973), Wijnbergen (1982, 1972), Fry (1986, 1988, 1978), Gupta (1984), Mazuar and Alexander (2001), Chang (2002), Calderon and Liu (2003) and Jenkins and Katircioglu (2010).

² McKinnon (1973), King and Levine (1993), Neusser and Kugler (1998), Levine et al. (2000) and Jenkins and Katircioglu (2010).

³ Gurley and Shaw (1967), Goldsmith (1969) and Jung (1986).

approach is that it can be applied whether the series are I(0) or I(1). This approach has an advantage on other cointegration test due to certain reasons that this approach is based on OLS method. This approach integrates short run dynamics from long run equilibrium without losing long run information (Banerjee et al. 1993). This is more flexible approach because it deals with different types of integrating orders, e.g I(0) or I(1) (Pesaran and Pesaran, 1997). In a conditional unrestricted Error Correction Mechanism (ECM), F-statistic or Wald test is used in order to test the significance of lagged levels of the variables (Pesaran et al. 2001). This approach is more significant than other approaches because it is more robust for small samples (Ghatak and Siddiki, 2001). Under this approach the model takes sufficient numbers of lags in order to capture the data generating process in general to specific modelling (Laurenceson and Chai, 2003). This approach also evades the unit root pre-testing (Pesaran et al. 2001). The main purpose of unit root test is to determine whether series is I(1) or I(0). This approach deals with both I(1) or I(0) so this evades the unit root approach (Bahmani-Oskooee, 2004). It avoids all the things which Johansen's approach has (Waqas et al., 2011). There is no need to determine whether data has deterministic trend or not, optimal lag orders and order of Vector Auto Regressive (VAR). ARDL approach was applied by Pesaran et al. (2001) and Error Correction version of the ARDL is as follows:

$$\begin{aligned}
DGDP_t &= a_0 + \sum_{i=1}^2 b_i DGDP_{t-i} + \sum_{i=1}^2 c_i DMT_{t-i} + \sum_{i=1}^2 d_i DDC_{t-i} + \sum_{i=1}^2 f_i DIT_{t-i} \\
&+ \partial_1 GDP_{t-1} + \partial_2 DMT_{t-1} + \partial_3 DC_{t-1} + \partial_4 IT_{t-1} \\
DMT_t &= a_0 + \sum_{i=1}^2 b_i DMT_{t-i} + \sum_{i=1}^2 c_i DGDP_{t-i} + \sum_{i=1}^2 d_i DDC_{t-i} + \sum_{i=1}^2 f_i DIT_{t-i} \\
&+ \partial_1 GDP_{t-1} + \partial_2 DMT_{t-1} + \partial_3 DC_{t-1} + \partial_4 IT_{t-1} \\
DDC_t &= a_0 + \sum_{i=1}^2 b_i DDC_{t-i} + \sum_{i=1}^2 c_i DGDP_{t-i} + \sum_{i=1}^2 d_i DMT_{t-i} + \sum_{i=1}^2 f_i DIT_{t-i} \\
&+ \partial_1 GDP_{t-1} + \partial_2 DMT_{t-1} + \partial_3 DC_{t-1} + \partial_4 IT_{t-1} \\
DIT_t &= a_0 + \sum_{i=1}^2 b_i DIT_{t-i} + \sum_{i=1}^2 c_i DGDP_{t-i} + \sum_{i=1}^2 d_i DMT_{t-i} + \sum_{i=1}^2 e_i DDC_{t-i} \\
&+ \partial_1 GDP_{t-1} + \partial_2 DMT_{t-1} + \partial_3 DC_{t-1} + \partial_4 IT_{t-1}
\end{aligned}$$

3. Results and discussion

Table 1 gives the results of ADF and PP, commonly used unit root tests. All the variables are stationary at first difference under both tests, except GDP and MT. Under ADF results GDP is stationary at first difference but in PP it is not stationary. The study preferred ADF test result and considered GDP stationary at first difference. MT is stationary at level under ADF result but PP result shows that MT is stationary at first difference. Study again preferred ADF and deals MT at level.

Table 1 ADF and PP unit root tests

Variables	ADF				PP			
	With trend							
	Level	P*	Difference	P*	Level	Q*	Difference	Q*
DC	-2.597	3	-3.615**	1	-2.083	8	-3.874**	1
GDP	-3.013	1	-6.072***	3	-2.529	7	-2.824	3
IT	-2.400	1	-3.352*	1	-3.120	6	-5.596***	1
MT	-3.832**	3	-3.816	4	-2.998	4	-3.971***	2
Without trend								
DC	-0.436	4	-3.641***	1	0.196	9	-3.933***	3
GDP	1.217	2	-5.299***	2	2.082	4	-2.913**	7
IT	-0.544	2	-3.485***	1	-1.272	3	-5.796***	3
MT	-0.267	2	-3.892***	3	0.106	5	-4.019***	3

Notes: DC is real banking sector's domestic credit; GDP is real gross domestic product; IT is real imports plus export of goods and services and MT is real broad money. P shows the maximum lag length, as determined by using AIC. Under PP test Q* shows Newey-West Bandwith, as determined by Bartlett-Kernel.*

**** shows 99% significance level; ** shows 95% significance level and * represents 90% significance level.*

The ARDL cointegration approach is used in order to explore the long run equilibrium relationship among variables. ARDL approach is adopted because three variables are stationary at first difference and one is stationary at level. Table 2 shows the results of bonds test for cointegration. Results illustrated the long run relationship between the variables because the F-statistics lies above upper bonds.

Table 2 Results of bonds test for cointegration

Variables	F-Statistics	Conclusion (H0)
F (GDP/MT, DC, IT)	3.4230***	Conitegration
F (MT/GDP, DC, IT)	4.8524***	Conitegration
F (DC/GDP, MT, IT)	1.7579*	No Conitegration
F (IT/GDP, DC, MT,)	2.1971*	No Conitegration

*Note: AIC and SBC were used for the lag length. * Indicates that the statistic lies below the lower bound, ** it falls within the lower and upper bounds and *** it lies outside the upper bound.*

Moreover, financial development and credit disbursed by commercial banks are positively related with economic growth, which shows that financial development and disbursement of credit by domestic banks increased economic growth. International trade is negatively related with economic growth (Table 3).

Table 3 Long run estimates

Estimated Long Run Coefficients using the ARDL Approach ARDL (1,0,0,0) selected based on Schwarz Bayesian Criterion (SBC)		
Variables	Coefficient	Standard Error
Constant	2.8684***	1.1382
IT	-1.1374***	0.0670
DC	0.39447***	0.0685
MT	1.5236***	0.7357

Note: GDP is dependent variable.

**** shows 1% significance level; ** shows 5% significance level and * represents 10% significance level.*

The next step is to estimate the short run dynamics among variables. ECM model is estimated, associated with long run estimates we obtain from SBC-ARDL (1,0,0,0). Coefficient of error correction is significant and negative in sign, which shows speed of convergence towards equilibrium. Large value of ECM term shows slow speed of convergence towards equilibrium and vice versa, after once shocked. Coefficients of financial development and credit disbursed by domestic banks are positively significantly related with economic growth. Moreover, international trade significantly negatively affects the economic growth (Table 4).

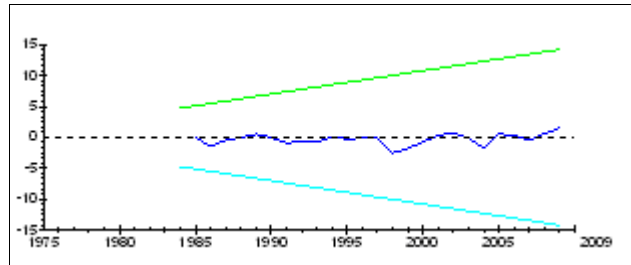
Table 4 Results of Error Correction Model

Error Correction Representation for the Selected ARDL Model ARDL(1,0,0,0) selected based on Schwarz Bayesian Criterion			
Variables	Coefficient	Standard Error	T-Ratio
Constant	-.30648	0.2518	0.161
dDC	0.0497	0.0288	1.725
dMT	0.1923	0.0829	2.319
dIT	-0.1435	0.0523	2.743
ECM(-1)	-0.1262	0.0615	2.052
R-Squared	0.51287	R-Bar-Squared	0.48672
S.E. of Regression	0.030033	F-stat.	3.1498[.029]
DW-statistic	1.9025		

Note: R-Squared and R-Bar-Squared measures refer to the dependent variable dGDP and in cases, where the error correction model is highly restricted, these measures could become negative.

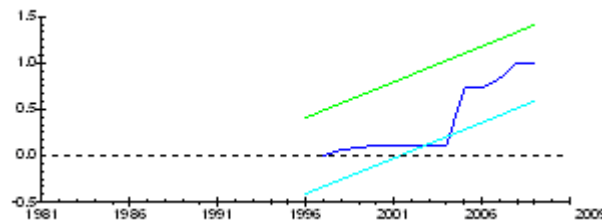
Brown et al. (1975) proposed two tests Cumulative Sum and Cumulative Sum of Square, to check the structural stability. CUSUM test captured the systematic changes in regression coefficients, while CUSUMSQ detain the departure of parameters from constancy. Hence, parameter consistency is checked by using these two tests. Following graphs shows the stability of model for whole sample because the residuals are within 5% critical bonds (Figure1 and Figure 2).

Figure 1 Cumulative Sum of Recursive Residual



The straight line represent critical bonds at 5% significance level

Figure 2 Cumulative Sum of Square Recursive Residual



The straight line represent critical bonds at 5% significance level

Table 5 Results of Pair wise Granger Causality Tests

Pair wise Granger Causality Tests			
Null Hypothesis:	F-Statistic	Probability	Conclusion
GDP does not Granger Cause DC	2.40498	0.10746	GDP...DC
DC does not Granger Cause GDP	0.46858	0.63039	
IT does not Granger Cause DC	2.30679	0.11698	IT...DC
DC does not Granger Cause IT	2.15711	0.13326	
MT does not Granger Cause DC	2.47097	0.10153	MT...DC
DC does not Granger Cause MT	1.75842	0.18962	
IT does not Granger Cause GDP	11.2258	0.00023	IT → GDP
GDP does not Granger Cause IT	2.86387	0.07273	
MT does not Granger Cause GDP	7.40269	0.00244	MT → GDP
GDP does not Granger Cause MT	0.26231	0.77102	
MT does not Granger Cause IT	12.2273	0.00013	MT → IT
IT does not Granger Cause MT	0.92838	0.40625	

According to the obtained results supply-leading hypothesis is accepted in case of Pakistan, because there is unidirectional causality among financial development and economic growth. The results are in line with Khan et al. (2005); Anwar et al. (2011). Moreover, unidirectional causality is observed from international trade to economic growth and from financial development to international trade (Table 5).

4. Conclusions

The aim of this study is to check the possible direction of causality and long run equilibrium between economic growth, financial development and international trade using the annual data for the period of 1973-2009. ADF and PP unit root test results shows that GDP, IT and DC are I(1), while broad money is I(0). Bonds test for cointegration result shows a long run relationship between financial development, international trade, domestic credit and economic growth. Granger causality test results reveals unidirectional causality from financial development to economic growth, from international trade to economic growth and from financial development to international trade. As a final point, this study rejected the demand following hypothesis in case of Pakistan. Findings of this study enlighten that in order to stimulate economic growth, financial development must be enhanced, e.g development of financial institutions and stock markets. Moreover, steps for financial sector liberalizations must be taken and attention should be given to long run policies.

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