

## **THE IMPACT OF TRADE AND FINANCIAL-OPENNESS ON GOVERNMENT SIZE: A CASE STUDY OF PAKISTAN**

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### **Abstract**

*This study is an attempt to explore the impact of trade and financial openness on government size in the case of Pakistan. In doing so, we utilized FMOLS for cointegration and Ng-Perron for unit root estimation along with ECM for short run dynamics. Empirical results reveal that current government expenditures influence government size in future. Trade-openness is associated positively with the size of government in Pakistan. This shows that more openness of economy will increase government expenditures and proves the existence of Cameron (1978) and Roderick (1998) hypothesis. Financial openness and government size are allied inversely and insignificantly while supporting conventional wisdom hypothesis or domestic fiscal imbalance hypothesis in Pakistan. Increase in economic growth seems to raise government spending while high rates of unemployment lower the government expenditures.*

**Key Words:** *Globalization, Government Size, JEL Classification: F1, H5*

### **Introduction**

The expansion in the size of public economy appeared during the period of 1980s while Cameron (1978) already established a positive relationship between trade openness and the size of the public sector. There appeared a blend of economic, sociological and political characteristics. Along with this, a crucial part was played by the strength of labour confederations which might exchange moderate wage setting with regard to higher public transfers as analyzed by Cameron (1980). The public sector asserts in mitigating certain adverse effects on the incomes of citizens accruing on account of trade openness and it also serves as a risk-reducing tool. Mostly among the industrialized countries as highlighted by (Liberati, 2006), capital movements were heavily controlled for<sup>1</sup> and the role of financial openness was ignored in the discussion. Another argument about the government expenditures is that it provides social insurance against external risk indicated by the end of 1990s when Rodrik (1998) emphasized upon the direct linkages between trade-openness and the size of government. In this case, citizens will demand more re-distribution by means of additional public expenditures because trade openness increases external risk.

In the 21<sup>st</sup> century literature, Sanz and Velázquez (2003) elaborated the concept of financial openness through foreign direct investment. The multinationals change their location easier as compared to “national” companies, therefore, on the basis of this like Rodrik (1998) other experts also emphasized on the fact that countries having larger stocks of FDI encounter higher risk in total employment. It is often observed that multinationals make weak commitments to countries because their country of origin is not specified. The government’s potential for financing the expenditures on social protection requires this type of environment as indicated by Tanzi (2000) and which facilitate shrivel of tax bases also. On the other hand, the impact of financial openness and trade openness on social welfare expenditures in a positive manner was elaborated by authors like Bretschger and Hettich (2002), thus, they supported the compensating hypothesis of Rodrik (1998). Contrary to above findings, impact of financial openness on social welfare<sup>2</sup> are not found by Swank (2002).

According to Dreher (2003), openness to globe has no impact on taxes and social policies in OECD economies. Many researchers were unable to develop consensus regarding the negative relationship between the openness of the economy on capital income taxes as established in the work of Rodrik (1998) and Grubert (2001). Moreover, Bretschger and Hettich (2002) indicated that there exists a negative relationship between openness and corporate tax rate. The openness is positively related to labour tax. However, Liberati (2006) rejected the above mentioned argument. He argued that there might be impact of financial openness on the distribution of public expenditure at various levels of government (local and central).<sup>3</sup> This is contrary to what Roderick (1999) and Cameron (1978) highlighted in their work. Further, with the prevalence of trade-integration size of the government increases with adverse impact, as public spending has a positive correlation with growth volatility which was analyzed by Carmignani *et al.* (2007).

A wide range of literature is focused on panel studies with respect to this topic but no time series analyses has been done generally and for Pakistan particularly. Therefore, new avenues are opened for research in this area for the developing economies like Pakistan. And this study is an attempt in this regard. The present study focuses on both long run and short run analyses regarding a linkage among trade & financial openness nexus along with the role associated with the size of government.

### **Model Specification and Data Collection**

Keeping view the nature of the relationship between the variables, the following log linear model has been specified:

$$LGS = \gamma_0 + \gamma_1 LTR + \gamma_2 FDI + \gamma_3 LRGDP + \gamma_4 LUN + \eta_t \quad (1)$$

Where;

LGS = Log of Government Expenditures as Share of GDP<sup>4</sup>

LTR = Log of Trade-Openness (Export + Import) as share of GDP

FDI = Foreign Direct Investment as share of GDP proxy for Financial Openness

LRGDP = Log of real per capita GDP

LUN = Log of Unemployment rate

The data on foreign direct investment, government spending or expenditures, real GDP per capita, trade openness and unemployment rate have been collected from Pakistan Economic Survey (various issues).

As described by Roderick (1998) and Cameron (1978), compensation hypothesis explains that trade-openness is positively interconnected with government size due to its greater risks because governments afford social insurance against exterior risks.<sup>5</sup> Financial openness is also joined with lesser size of government because it reduces the ability to preserve high levels of public spending (Liberati, 2006). But Swank (2002) pointed out the fact that increase in international capital mobility is allied with decline in social welfare expenditures especially in developed democracies, which is called *conventional wisdom hypothesis*. While, *domestic fiscal imbalance hypothesis* explains this channel in such a way that financial openness and public spending are negatively related to each other in those countries which face significant public deficits [Swank (2002); Quijano and Gaecia (2005); & Liberati (2006)]. Descriptive statistics and correlation metrics concerning the variables of the model are presented in Table-1 given below.

**Table-1 Descriptive Statistics and Correlation Matrix**

<b>Variables</b>	<b>GS</b>	<b>GDPC</b>	<b>FDI</b>	<b>TR</b>	<b>UN</b>
<i>Observations</i>	36	36	36	36	36
<i>Mean</i>	2.4144	9.4757	0.5620	3.5033	1.4033
<i>Median</i>	2.4170	9.4954	0.4533	3.5300	1.3346
<i>Maximum</i>	2.8204	10.1751	1.9714	3.7160	2.1126
<i>Minimum</i>	2.0584	8.9502	-0.0632	2.9923	0.5306
<i>Std. Dev.</i>	0.1806	0.3263	0.4636	0.1304	0.4822
<b>GS</b>	<b>1.0000</b>	-0.2631	-0.1862	0.3535	-0.3524
<b>RGDP</b>		<b>1.0000</b>	0.7846	0.2416	-0.8617
<b>FDI</b>			<b>1.0000</b>	0.4521	0.7358
<b>TR</b>				<b>1.0000</b>	0.3477
<b>UN</b>					<b>1.0000</b>

From Table-1 it can be observed that there is negative correlation among government spending, GDP per capita, financial openness and unemployment but positive correspondence between government spending and trade openness.

Financial openness is positively associated with international trade and unemployment. There also prevails positive link of GDP per capita with financial openness and trade to openness.

## **Methodological Framework**

### **1) Ng-Perron Unit Root Test**

In order to inspect the integrating level of variables, standard tests like ADF and Philip-Perron do not provide consistent results due to their poor size and properties.<sup>6</sup> Ng-Perron (2001), newly proposed test, is superior because it controls the said problems.

### **2) Fully modified Ordinary Least Squares (FMOLS) Approach for Co integration**

In this study, Fully Modified Ordinary Least Squares (FMOLS) technique has been used for examining the existence of long run relationship between the variables. FMOLS offer best possible calculated values for cointegration regressions (Bum and Jeon, 2005). This approach seems to apply Kernel estimators of the Nuisance parameters for numerical analysis. For the accomplishment of asymptotic effectiveness, this approach amends least squares to test serial correlation affects and endogeneity in the independent variables which results from confirmation of a cointegrating link.<sup>7</sup> Econometrical literature seems to suggest that said technique is the best mode to deal with these nuisance estimates but on contrary, it may be tricky to apply for small samples. For the investigation of long run correlation through Fully Modified Ordinary Least Squares (FMOLS), it is necessary condition that all variables must be stationary at I (1).

As focused by Engle and Granger (1987) that linear combination exists between the variables if variables are having I(1) integrating order. If all variables are integrated at their 1st difference then this lends support to employ the Johansen and Juselius (1990) co-integration approach.

To investigate correlation between economic variables in a long span of time, Johansen and Juselius (1990) test not only provides an analytical statistical framework but also gives critical values to compare the statistics. Lag length selection is necessary in Vector Auto Regressive (VAR) model to establish the non-stationary components. Akaike Information Criterion (AIC) and Schwartz Bayesian Criterion (SBC) have been used to determine possible lag length. The lowest values of AIC and SBC provide guidelines to select the lags that help to obtain desirable results.

To establish the integrity of fit of the FMOLS model, sensitivity analysis and the stability test are employed. The sensitivity analysis investigates the serial

correlation, functional form, normality and heteroskedasticity connected with the model. The stability test is conducted through application of both cumulative sum of recursive residuals (CUSUM) as well as cumulative sum of the squares of recursive residuals (CUSUMsq). Reliability of Fully Modified Ordinary Least Squares (FMOLS) can be checked through the prediction error.

**Results Interpreting Design**

In the prior step, order of integration of variables included in the model is investigated through employment of standard test like Ng-Perron (2001). The results of Table-2 reveal that all variables in the model are having unit root problem at their level form with constant and constant & trend. It is concluded that all variables are  $I(1)$  and lend support for investigation of long run relationship through FMOLS.

**Table-2 Unit Root Estimation**

Variables	Ng-Perron at Level with Constant				
	MZa	MZt	MSB	MPT	HAC.C.V
<b>LGS</b>	-4.3362	-1.4714	0.3393	5.6516	0.0082
<b>LGDPC</b>	0.6439	0.3245	0.5039	21.4780	0.0104
<b>FDI</b>	-0.4393	-0.2281	0.5193	18.408	0.0232
<b>LTR</b>	-2.4601	-0.8477	0.3445	8.6477	0.0096
<b>LUN</b>	-0.5972	-0.3412	0.5713	20.1450	0.0256
Ng-Perron at Level with Constant and Trend					
<b>LGS</b>	-4.6108	-1.5183	0.3292	19.7629	0.0082
<b>LGDPC</b>	-5.3261	-1.4296	0.2684	16.4088	0.0055
<b>FDI</b>	-13.4677	-2.5948	0.1926	6.7668	0.0512
<b>LTR</b>	-7.1856	-1.8886	0.2628	12.6917	0.0080
<b>LUN</b>	-10.8817	-2.2229	0.2042	8.8992	0.0200

After inspecting lag-length which is 1 on the basis of minimum value of AIC, the second step of FMOLS is used to find out long run co-integration. While Table-4 summarizes the results of co-integration analysis of government size with other battery of variables.

Table-3 Unit Root Estimation

Variables	Ng-Perron at 1 <sup>st</sup> Difference with Constant				
	MZa	MZt	MSB	MPT	HAC.C.V
LGS	-13.3274**	-2.3758	0.17827	2.5969	0.0112
LGDP	-17.2885*	-2.77292	0.16039	2.01192	0.00686
FDI	-22.4932*	-3.0674	0.1363	2.0222	0.1140
LTR	-8.3259**	-2.0401	0.2450	2.9431	0.0130
LUN	-17.8156*	-2.8944	0.1624	1.6977	0.0272
Ng-Perron at 1 <sup>st</sup> Difference with Constant and Trend					
LGS	-17.0363***	-2.5293	0.1484	7.5240	0.0098
LGDP	-14.8009***	-2.65315	0.17926	6.54378	0.0052
FDI	-16.0493***	-2.6218	0.1633	6.8833	0.0916
LTR	-30.0970*	-3.7910	0.1259	3.5245	0.0210
LUN	-17.0205***	-2.8868	0.1696	5.5349	0.0253

Note: HAC.C.V represents HAC corrected variance while \*, \*\* & \*\*\* show significance at 1%, 5% & 10% level of stability.

Johansen and Juselius test for cointegration has been employed for the long run relationship between the variables of the model. The results are reported in Table-4.

Table-4 J-J Maximum Likelihood Test for Co-integration

Hypotheses	Likelihood ratio	5 % critical value	Prob-value	Maximum Eigen value	5 % critical value	Prob-value
$R = 0$	96.907	79.341	0.0013	56.300	37.164	0.0001
$R \leq 1$	40.607	55.245	0.4886	17.227	30.815	0.7672
$R \leq 2$	23.379	35.011	0.4841	12.164	24.252	0.7508
$R \leq 3$	11.216	18.398	0.3708	9.523	17.148	0.4427
$R \leq 4$	1.693	3.841	0.1933	1.6926	3.841	0.1933

Table-4 presents the trace test and eigen value test. Based on trace-statistic and critical value one can reject the null hypothesis  $R \leq 0$  in favour of general alternative  $R = 1$ .

Consequently, it can be concluded that there is one co-integrating relationship (vector) between government size and independent variables. The eigen value test shows that the null hypothesis of no co-integration ( $R = 0$ ) is rejected at 1% level of significance indicating one co-integrating vector. Therefore, our annual data from 1971 to 2006 appear to support the proposition that, in Pakistan, there exists a stable long-run relationship among government size, trade-openness, financial openness, GDP per capita and unemployment rate.

Table-6 Model Estimation

Variables	Dependent Variables = LGS					
	OLS Results		OLS Results		OLS Results	
	Co-efficient	Inst. Values	Co-efficient	Inst. values	Co-efficient	Inst. values
Constant	-2.7519	0.0135	8.9368	0.5898	9.9790	0.5484
LGS <sub>t-1</sub>	0.7415	0.0000	0.7416	0.0000	0.6990	0.0000
LTR	0.3928	0.0352	-6.1764	0.5071	-6.4769	0.4873
LTR <sup>2</sup>	–	–	0.9379	0.4806	0.9749	0.4640
LGDP	0.2435	0.0239	0.2210	0.0497	0.1825	0.1223
LUN	-0.2012	0.0043	-0.1883	0.0097	-0.2057	0.0067
FDI	-0.0457	0.4006	-0.0446	0.4164	0.1064	0.5135
FDI <sup>2</sup>	–	–	–	–	-0.0719	0.3273
R-squared = <u>0.8357</u> Adjust-R-squ = <u>0.8074</u> Akaike criterion = <u>-2.0520</u> Schwarz criterion = <u>-1.7854</u> Durbin-Watson = <u>1.79</u> F-statistic = <u>29.5088 (0.000)</u>		R-squared = <u>0.8386</u> Adjust-R-squ = <u>0.8041</u> Akaike criterion = <u>-2.0129</u> Schwarz criterion = <u>-1.7019</u> Durbin-Watson = <u>1.78</u> F-statistic = <u>24.2613(0.000)</u>		R-squared = <u>0.8444</u> Adjust-R-squ = <u>0.8040</u> Akaike criterion = <u>-1.9920</u> Schwarz criterion = <u>-1.6365</u> Durbin-Watson = <u>1.70</u> F-statistic = <u>20.9341(0.000)</u>		

Next step is to apply FMOLS method for the estimation of long run elasticities, after the fulfillment of existence of co-integration relation among a set of  $I(1)$  variables. Table-6 shows the estimation results from FMOLS analysis. Results show that more than 70 percent government expenditures seek to rise through the size of government in future. It is concluded that 8 percent rise in government spending is accompanied with 5.932 percent from the previous policies. The trade-openness proves the existence of *Cameron (1978) and Roderick (1998) hypothesis* by revealing that more open economies are allied with greater government size. Coefficient of financial openness proves the pervasiveness of *conventional wisdom hypothesis* or *domestic fiscal imbalance hypothesis*<sup>8</sup> but insignificant with greater instability values (prob-values). Actually trend shows that average FDI in Pakistan is not more than 0.5620 & 0.956 as % GDP through 1971-2006 and 1991-2006 respectively. The inflow of FDI into Pakistan is meager which is only concentrated on a few areas, mostly in the power sector along with telecommunications and banking sector etc. Declining impact of financial openness on government size is eaten up by the government rising expenditures due to *compensation effect*. Simply, one may come to conclusion that compensation hypothesis dominates the conventional wisdom hypothesis.

Rise in economic growth also pushes government expenditures to rise further. It is concluded that 6 percent increase in economic growth increases government size by 1.462 percent annually. Finally, increase in unemployment makes

government spending to decline. There are no compensation policies for unemployed force in Pakistan.

It is necessary to investigate the behavior of independent variables on dependant actor in short span of time, for this following linear-equation is being modeled as:

$$\Delta LGS = \gamma_0 + \gamma_1 \Delta LTR + \gamma_2 \Delta FDI + \gamma_3 \Delta LR GDP + \gamma_4 \Delta LUN + \eta_{t-1} + \varepsilon_t \quad (2)$$

**Table-7 FMOLS Estimation for Short Run**

Variables	Dependent Variables = $\Delta LGS$		
	Coefficient	t values	Inst. values
Constant	-0.0079	-0.4483	0.6578
$\Delta LGS_{t-1}$	1.1585	2.7303	0.0114
$\Delta LGDPC$	0.4493	1.9898	0.0576
$\Delta LTR$	0.3245	1.6716	0.1071
$\Delta LTR_{t-1}$	0.0664	0.3245	0.7483
$\Delta LUN$	-0.1453	-1.4999	0.1461
$\Delta LUN_{t-1}$	0.0403	0.3664	0.7171
$\Delta FDI$	-0.0394	-0.7607	0.4539
$ecm_{t-1}$	-1.2311	-2.6311	0.0144
R-squared = 0.4419 Adjust-R-squ = 0.2633 Akaike criterion = -1.975 Schwarz criterion = -1.571 Durbin-Watson = 1.948 F-statistic = 2.474 (0.039)		<u>Sensitivity Analysis</u> Serial Correlation LM = 0.3864 (0.6837) ARCH Test = 1.0500 (0.3628) Normality Test = 2.3656(0.3064) Heteroscedisticity Test = 0.9693 (0.5228) Ramsey Reset Test = 1.0301 (0.3985)	

Table-7 reveals the short run impact of independent concerned variables on government spending. Government spending is highly influenced through previous policies in a short span of time. Trade-openness and increments in GDP per capita are allied with an increase in government spending significantly at 5 & 10 percent level of significance respectively. FDI and unemployment rate are having signs according to theory but insignificant.

The ECM coefficient indicates discrepancy of short run variables to equilibrium. The lagged error correction term is negative and statistically significant which confirms the long run equilibrium between the variables.

The coefficient of  $ecm_{t-1}$  is equal to (-1.2311) for short run model and implies that deviation for the long-term government spending or government



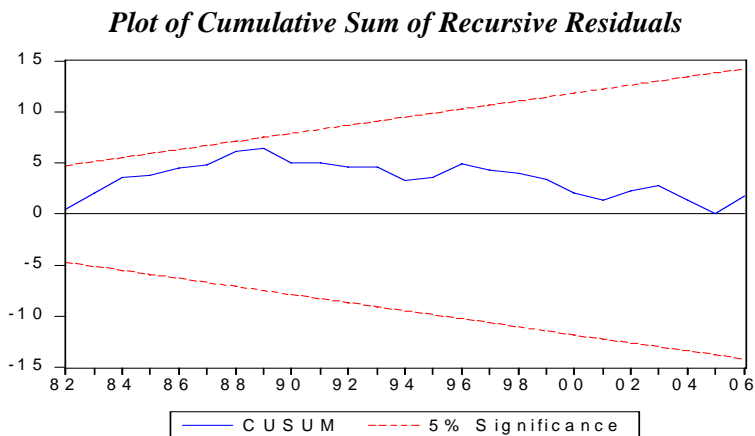
expenditures is corrected by 123.11 per cent over the each quarter at 5 percent level of significance.

***Sensitivity Analysis***

Diagnostic test for LM serial correlation, normality of error term, autoregressive conditional heteroscedasticity, heteroscedasticity and functional form of short run model is also investigated. The results of sensitivity analysis are reported in Table-7. The empirical evidence shows that short-run model seems to passes all diagnostic tests. The empirics confirm that there is no autocorrelation or serial correlation and error term is normally distributed. Short run model is well functioned as verified by empirical evidence presented in Table-7. There is no evidence on occurrence of heteroscedasticity in model for short span of time and same holds for autoregressive conditional heteroscedasticity.

Empirical and structural stability of selected model specification can be checked through the use of cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq). The stability of long run as well as short run estimates is investigated through the application of cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq) as suggested by Pesaran and Shin (1999). Figure 1 and 2 shows the graphical representation of both CUSUM and CUSUMsq tests. If the tests statistics are within critical bounds with significant at 5 percent, then null hypothesis is rejected that is “empirical equation or regression is well-specified” (see for more details, Ouattara, 2004).

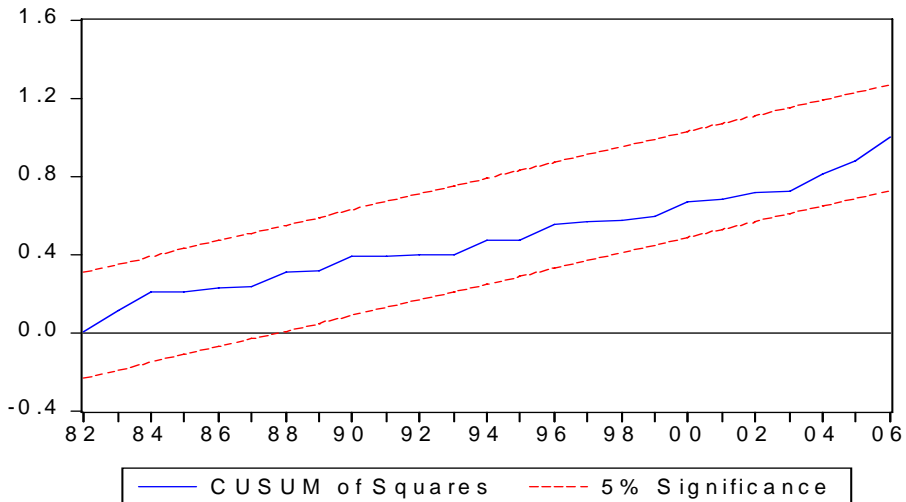
Figure-1



The straight lines represent critical bounds at 5% significance level.

Figure-2

Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level.

Plots of both CUSUM and CUSUMsq are within the boundaries which confirm the stability of the model.

### Conclusion

This study is an attempt to explore impact of trade and financial openness on government size in the case of transition economy like Pakistan. In doing so, we utilized FMOLS for cointegration and Ng-Perron for unit root estimation along with ECM for short run dynamics.

Empirical results reveal that current government expenditures influence government size in future. Trade-openness is associated positively with the size of government in Pakistan. This shows that more openness of economy will increase government expenditures and proves the existence of *Cameron (1978) and Roderick (1998) hypothesis*. Financial openness and government size are allied inversely but insignificant while supporting *conventional wisdom hypothesis* or *domestic fiscal imbalance hypothesis* in Pakistan. Improvements in economic growth seems to increase government spending while high rates of unemployment lower the government expenditures.

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## **Notes**

1. The United States, one of the first countries to liberalize capital movements, made this step in 1974.
2. It is claimed that dataset utilized in Swank (2002) seems to extend to 1993. During those periods of time, openness of financial resources did not play its significant role to affect the countries or national economies. It is checked that inflows of capital were kept under controlled in many European economies during the periods of Nineties to begin. While Great Britain did abolish the system of many European Countries in 1979.
3. Liberati (2006) explained as one which central governments strategically shift public expenditures to local government in order to avoid to cut them directly.
4. Government current consumption expenditures defined as the sum of the value of all goods and services directly produced by the government and not sold at market prices plus government purchases of goods and services that are distributed without charge to the community.
5. For details, please see Roderick (1998); Cameron (1978); Sanz and Velázquez (2003); Quijano and Gaecia (2005) and Liberati (2006).
6. These tests seem to over-reject the null hypotheses when it is true and accept it when it is false.
7. For details please see Philip and Hansen (1990), Hansen (1995).
8. For more details please see Swank (2002); Quijano and Gaecia (2005); & Liberati (2006).