

Appropriate Exchange Rate Regime for Economic Structure of Pakistan

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Abstract. This study attempts to find the appropriate exchange rate regime for economic structure of Pakistan. To this end the study uses ARDL bond testing approach to estimate long run and for the estimation of short run analysis Error correction model (ECM) is applied. Time series data is used over the period from 1984 to 2012. Findings reveal that Trade openness, foreign exchange reserves, and inflation rate are important determinant while choosing appropriate exchange-rate regime for economy having features like Pakistan. On the basis of analysis, this study suggests that both extreme ends hard peg and free float are unfavorable for it. The results also survive during robustness check. However, caution is required while making a policy decision as clear-cut answer is absent. Nonetheless, choice of regime is a difficult task in empirical analysis because few factors cannot explain actual regime.

Keywords. Exchange Rate Regime, Classification, ARDL.

JEL. F31, F33, F44.

1. Introduction

After the down fall of Bretton Wood System most countries decided to say goodbye to their fixed exchange rate regime to float (Vuletin, 2004). Since then a sizeable literature has been devoted to the choice of appropriate exchange rate regime, for instance, Chang (1999), Fischer (2001), Frankel (1999, 2003), Stockman (2003), Hoffman (2007) Despite all the efforts, determination of appropriate exchange rate regime still remains a question for the developing economies (Frankel, 1999). Particularly, as the globalization -real and financial- is increasing, the question about appropriate exchange rate regime and assuming more importance than ever. The increasing globalization brings complexities of the open economy making appropriate exchange rate regime more crucial as the regime leaves its impact on all other macroeconomic variables (Yagci, 2001).

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Analysis of the Global Economies has shown that a couple of developed states (United States, Australia, Canada, Germany, Japan and United Kingdom) adopted free float whereas few developed countries (Denmark, Switzerland, Ireland, Hungary and Hong Kong) have followed fixed regime from 1974 to 2001. Surprisingly the pattern of Gulf Countries (Bahrain, Saudi Arabia, Qatar, and Oman) has been quite stable and they have always adopted the fixed regime (Levy-Yeyati & Sturzenegger, 2001a, 2003). Unfortunately, the developing world is still looking for optimum choice of regime that may be suitable for their economic improvement.

According to (Frankel, 1999) one single regime cannot be considered beneficial for all countries even if they are similar in nature. Every country has its own economics structure, characteristics and economic preferences. So choice of exchange rate regime is a country-specific concept. It depends upon economic strength, degree of openness, trade volume, capital inflow, source and nature of economic shocks, inflation history, financial development and policy objectives of the country (Yagci, 2001). Empirical literature has evidently shown that oil exporting countries are following fixed regime (Klein & Shambaugh, 2010). Their decision may be rational because they are exporting single commodity and their stages of financial development, capital inflow and policy objectives are same.

The objective of this study is to improve the understanding about choice of exchange rate regime in case of developing countries like Pakistan. Taking theoretical backing from Mundel-Flaming theory of optimal currency area (OCA) this study attempts to identify factors important in determination of exchange rate regime. Much of the literature has been developed in comparison of extreme ends of fixed and floating regime (Hoffmann, 2007) thus ignoring managed float and/or intermediate regimes. This Paper does not hinge on fixed or float rather talks about tendency of the economy towards fixed or float. Ranges of exchange rate regime remain between zero to one (0 to 1) that has been constructed by following Karass (2012). Our study finds that trade openness; foreign exchange reserves, inflation rate and financial development are important determinant.

2. Theoretical background

There are three different approaches when it comes to adoption of exchange rate regime. One is the Structural approach which focuses characteristics of economic structure of country. This approach is based on theory of optimal currency area (OCA). Under fixed and flexible arrangements, it requires capability to keep internal and external balance, secondly keeps an eye on economic shocks that are caused by fluctuation in trade and deterioration in terms of trade (Mundell, 1961). Basically, these studies conclude size and nature of economic shocks and economic structure of country are main determinants of optimal regime (Frenkel, 1982). These studies suggest if domestic and foreign shocks are real in nature even foreign are nominal in nature this will shift the demand for domestic goods. But if economy is facing nominal domestic shocks, amendment in exchange rate is not required.

Second the credibility and flexibility approach (Pagano, 1988) discuss that the monetary authority has two options to capture trade-off between flexibility and credibility. They can either maximize utility function or minimize cost function. This framework is useful when monetary authority want to choose exchange rate regime between two extreme ends (fixed and flexible).

Third, the bipolar view suggests international capital flow is not sustainable when countries are using intermediate exchange rate regime. So countries should move to extreme range of exchange rate regimes (Obstfeld & Rogoff, 1995).

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2.1. Classification of regime

We will discuss here two type of classification of exchange rate regime

2.1.1. MF Classification

Exchange rate regime is classified by International Monetary Fund in three categories for their members. First, Fixed or pegged (with a single currency or basket of currencies), second managed float (intermediate) and third is independent float. These three categories are based on official exchange rate of members and also their policies and flexibilities about exchange rate. Whenever members make any change in their exchange rate they have to report IMF. The basic problem is when countries actually (de-facto) follow different to officially claim (de-jure). This increases the ambiguities in analysis of exchange rate regime and also reduces transparency, effectiveness and performance of research policy. That's why often exchange rate regime is found different from declared regime. Existence of inaccuracy in regime mislead monetary policy, after identifying this problem IMF constructed new classification that have all information about exchange rate, monetary policy and intention of policy on the basis of foreign reserves movement and actual exchange rate.

2.1.2. Alternatives Classification

In 1999, IMF adopted new method to improve earlier classification but its practical usefulness was limited due to insufficient historical data. The flaws of this classification were empirically exposed when (Levy-Yeyati, 2001b) identified 35 countries as free floaters but actually 12 of them were not found free floaters. These 12 countries are amongst the emerging markets. Calvo & Reinhart (2000) found many countries that were following hard peg regime arrangements but they had declared themselves as free floater. Bubula & Otker (2002) construct new classification on de-facto regime by using monthly database of all member countries. The sample period of this classification was limited (1990 to 2001) but this analysis was meaningful and interesting since it differs from Levy-Yeyati's de-facto classification, which ignored official classification of International Monetary Fund (Darne & Ripoll-Bresson, 2004).

3. Literature Review

It is evidence from history that decision of choosing exchange-rate regimes are not at once and ever, either willingly or unwillingly these are changed often (Vuletin, 2004). Bachetta & Wincoop (1998) for general equilibrium they used dynamic stochastic model in their paper. The study observes government expenditures and technological shocks under different regimes of exchange rate. Authors find that under restricted assumptions level of trade is not affected by exchange rate regime. Secondly, trade is lower under float when fiscal policy is used to stabilize economy, and third, if preference for domestic bond exists net capital flow will be lower under floating.

The groups that follow stabilization polices (Masson, Goldstein, & Frenkel, 1991) there point of view is fixed exchange rate provide more discipline in fiscal policy than flexible exchange rate. A good fiscal policy leads to enhance reserves, these reserves become cause of fiscal extension and fiscal extension appreciates exchange rate. So fixed exchange rate is collapsed, history shows fixed exchange rate mostly fails to discipline fiscal policy and causes devaluation crisis (Vuletin, 2004). Studies related to political economic issues (Alberola-Ila & Sanchez, 2001) express that there are hidden theoretical and empirical drawbacks in thoughts of conventional research papers on stabilization policies. Author mentions fiscal authority should spend more when it is socially advantageous. At fixed exchange rate, unstable policies deteriorate reserves and cause debt whereas under flexible

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exchange rate unsound policies protect themselves through variation in prices and exchange rate. So in this situation fiscal authority requests central bank to help. It is vital for central bank only pre-commit not to accommodate, except for short period.

The study related to financial crises (Chang, 1999) argued crises emerge in capital market due to “Bad policy” and “wrong predictions”. Bad policy augment is that debt burden renders fixed exchange rate unsustainable whereas wrong prediction refers to public trust on different institutions and projects. If people get back all deposits in fear of bankruptcy a cascade effect erupts and floating regimes becomes inevitable.

Beyond doubt, economic environment of each country differs from the other that rules out the possibility that a single regime is appropriate for each country. This has been highlighted by many researchers, for instance, Fischer (2008) indicate a period (1999 to 2006) in their study 15 countries shift from floating exchanges to intermediate and 6 countries move intermediate to floating exchanges. Frankel (2003) suggests in his study at the same time no single currency regime is beneficial. Husain *et al.*, (2005) recommends in developing countries relatively pegged exchange rate is better for policy implementation and also helped to maintain inflation at lower level. Another study (Berg *et al.*, 2000) indicates if a country has sustainable and flexible fiscal policy, international reserves and low capital mobility than fixed exchange rate is good for economy. And if the country has same economic conditions and economic shocks as its trade partners have, fixed exchange rate is appropriate otherwise flexible is good as it serve as a shocks absorber.

Flexible exchange rate is considered as shocks absorber (Edwards, 2005), in situation of domestic over production economy enhance its exports by devaluation of its exchange. The economic literature postulates that macro-economic targets - inflation, output, economic growth - can be achieved by different exchange rate policies. There is also link between output and exchange rate, fixed exchange rate and low inflation attract investors and higher level of investment push economy at growing path. However, a key point remains there that if exchange rate is pegged at wrong level then resources could be misallocated. However, this demands attention that investment increases in economies with fixed exchange rate regimes but productivity and per capita growth remains low as compare to flexible exchange rate (Ghosh *et al.*, 1997).

Hussain (2006) identifies important factors that affects exchange rate regime and also worked on choosing right regime for Pakistan. The study used “score card method” and compares economy of Pakistan with other 52 countries on the basis of size of economy, trade orientation, financial integration, fear of floating and macroeconomic stability. Paper finds the case against peg regime and concludes that Pakistan is not a natural candidate of fixed exchange rate regime. In policy recommendation this study recommends flexible exchange rate regime.

The countries with more stable and developed financial markets get benefits from flexible exchange rate regime in term of improving capability of adjusting to real shocks, without sacrificing economic stability that a credible fixed exchange rate may require. A study (Stotsky *et al.*, 2012) found strong relationship between non-agricultural growth and exchange rate regime. Author states in his paper that there is positive relationship between economic growth and flexible exchange rate in African countries but in some specification real exchange rate is significant. Over all, the paper suggests that appreciation is bad and overvaluation is damaging in non-agricultural economies. It is true that exchange rate regime matter for growth but reforms packages more.

Karass (2012) conducted an empirical study on 66 developing and developed economies. The study advocates that under fixed exchange rate regime

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performance of fiscal policy is effective and ineffective under flexible exchange rate regimes. The reason behind is that under flexible exchange rate regime government expenditure crowds out private investment.

Aliyav (2015) studies determinants of exchange rate regime in resource abundant and resource scarce countries by using multinomial logit regression. Using data of 145 countries from 1975-2004 findings point out that resource rich countries have more probability of having fixed regime and resource poor countries are less likely to have fix regime. Moreover, the author finds, independence of central bank and democracy has stronger and significant role in resource rich countries as compare to resource poor countries.

With the help of the literature reviewed we can build an argument that every country has its own economic conditions, trade orientation, financial integration and level of development thus choice of exchange rate regime is a country specific issue. Against this backdrop, the objective of this study is to investigate appropriate exchange rate regime for Pakistan. All this warrants that Pakistan should make individual decision to follow exchange rate regime by considering its peculiar economic condition and desired policy objectives instead of following other developing or developed countries.

4. Data Source and methodological frame work

The data on exchange rate has been taken from “Penn world table version 8.0 and IMF-IFS. While the data on real GDP, foreign exchange reserves, inflation, are attained from WDI and Pakistan Economic Survey and International Financial Statistics (IFS). Data on fiscal deficit has been collected from State Bank of Pakistan website whereas data on financial openness (capital account openness) comes from Chinn-Ito website. Sample starts from 1984 to 2012. The reason of starting from this year is exchange rate regime.

4.1. Methodological frame work

Stationary test is the first step in econometric analysis. We can say a series is stationary if it has constant variance and its mean value should also be zero. If our series is not stationary then analysis is not valid the results would be called spurious regression. For example, if series has only two variables with decreasing or increasing trend over time; the regression result confirms with high value of R^2 that both series are highly interconnected but actually they are totally unrelated. The outcome of unit root tests shows that all variables have different order to integration $I(1)$ and $I(0)$ so we will apply ARDL because of OLS is best if all variables are $I(0)$ and Johansen can be applied in case of only $I(1)$ (Johansen, 1988, 1991).

The functional relationship of variables is given under;

$$ERR_t = a + \beta_1 SIZE_t + \beta_2 TOPEN_t + \beta_3 INF_t + \beta_4 KaOpen_t + \beta_5 FBGDP_t + U_t \quad (1)$$

Where, ERR_t denotes exchange rate regime at time particular time t) and a is intercept term β etas are coefficients of variables, $Size$ stands for size of economy (real gdp), $Toppen$ stands for trade openness and liberalization, Inf refers inflation rate, $KaOpen$ (capital account openness) is used as proxy of financial openness, $Fbgdp$ is the proxy of fiscal shocks to economy and U for error term.

4.2. Estimation Technique

For long run relationship between Exchange rate regime and its predictors is found by ARDL bound testing approach by following the given equation;

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$$dERR_t = b_{11} + b_{12}(ERR)_{t-1} + b_{13}(LSIZE)_{t-1} + b_{14}(LTOPEN)_{t-1} + b_{15}(INF)_{t-1} + b_{16}(KaOpen)_{t-1} + b_{17}FBGDP_{t-1} + b_{12} \sum_{i=0}^n d(ERR)_{t-i} + b_{13} \sum_{i=0}^n d(LSIZE)_{t-i} + b_{14} \sum_{i=0}^n d(LTOPEN)_{t-i} + b_{15} \sum_{i=0}^n d(INF)_{t-i} + b_{16} \sum_{i=0}^n d(KaOpen)_{t-i} + b_{17} \sum_{i=0}^n d(FBGDP)_{t-i} + \mu_{11} \quad (2)$$

In the above equation i ranges indicates chosen lag length, d Symbolize as operator of first difference, α_{11} is the drift component and μ_{11} is random term.

4.3. Construction of dependant variable

Exchange rate regime is setting of nominal exchange rate that is decided by central bank either nominal exchange rate is automatically chosen by demand and supply of currency or it is fixed at any point by central authority. Here we use de-facto (opposite of de-jure) classification of exchange rate regime by Eduardo Levy-Yayati and Federico Sturzenegger (Levy-Yeyati, 2003).

Most of the studies on exchange rate regimes have used Dummy variable for exchange rate regimes, that is, 0 for fixed and 1 for flexible. But Exchange rate regime cannot be exact “0 or 1” as in practice it may be between these two extremes. For this cogent reason, in this study we attempt to convert data set in frictions (from zero to one) we put one for fixed and zero for flexible. So we can easily decide which regime country is following, for instance, Pakistan and United States both are using de jure flexible Exchange rate regimes.

To construct this variable we follow Karras (2012). For example According to his data set the value for USA is 0.10 in 2013 and value for Pakistan is 0.24 in same years it means both countries are following flexible Exchange rate regimes difference is this US following 10 percent fixed or 90 percent flexible and 0.24 means Pakistan is following 24 percent fixed or 76 percent flexible since zero means 100 percent flexible or *pure float*.

We used monthly average data of Exchange rate. If nominal Exchange rate (PKR/\$) is same as previous and next month we put “1” (fixed) if current, previous and next value is not same then we put “0” (flexible) and then we find average value that will indicate Exchange rate regimes for that particular year.

5. Results and discussions

Data series should be normally distributed is the first step of econometric analysis. In descriptive statistics, we analyze the values of Jarque Bera test; the value of variables has found to be insignificant it means all data series are normally distributed.

Table 1. Descriptive Statistics

Name of Variables	<i>ERR</i>	<i>LSIZE</i>	<i>LOPPEN</i>	<i>INF</i>	<i>LFER</i>	<i>KaOpen</i>	<i>FBGDP</i>
Mean	0.618035	6.372325	0.345383	8.497174	0.674129	-1.211838	-2.334483
Std. Dev.	0.217982	0.174531	0.027097	3.958215	0.270353	0.130217	2.765382
Skewness	-0.944168	-0.007421	-0.298005	0.719759	-0.764964	-5.102520	0.645222
Kurtosis	3.184572	2.069192	2.693171	3.646957	2.648655	27.03571	4.096676
Jarque-Bera	4.649848	1.119389	0.542990	3.217238	3.182824	823.9123	3.465434
Probability	0.097791	0.571383	0.762239	0.200164	0.203638	0.308614	0.176803
Sum	19.15909	197.5421	10.01611	263.4124	20.89801	-35.14331	-67.70000
Sum Sq. Dev.	1.425479	0.913832	0.020558	470.0240	2.192723	0.474778	214.1255
Observations	29	29	29	29	29	29	29

And also the estimated values of Kurtosis and Skewness indicate the normality of data. Stationarity of data is also required for valid analysis. There are four popular tests that can be applied to check unit root in data series. ADF, Phillips-

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Perron (PP) and KPSS these all test are equally valid for unit root. These tests actually reports about integration order of variables. In this study, we used ADF test that concludes order of integration is mixed. We find that the variable of inflation, foreign exchange reserve and capital account openness on level and remaining variables found to be stationary at 1st difference. So when we find I(0) and I(1) order of integration then we apply Auto Regressive Distributed Lag (ARDL). Output of unit root tests are given in Table 2.

Table 2. Statistics of ADF

Name of Variables	Intercept		Intercept & Trend	
	t-Stat	Prob.	t-Stat	Prob.
ERR_t	-5.348013**	0.0018	-5.552009**	0.0005
$LSIZE_t$	-3.521759**	0.0145	-3.477914**	0.0608
$LOPEN_t$	-2.744482**	0.0790	-6.752136*	0.0000
INF_t	-3.905330*	0.0068	-3.821596*	0.0330
$LFER_t$	-6.353556*	0.0000	-6.250032*	0.0001
$KaOpen_t$	-5.291503*	0.0000	-5.188035*	0.0013
$FBGDP_t$	-4.353594**	0.0002	-4.260462**	0.0003

Note: * is indication of having stationary on level and ** indicates having stationary on first difference

5.1. Optimal Lag Length

After checking the stationary of series, we have to see optimal lag length. Optimal lag length indicates that how many lag should be use in model. The results of above table shows three lag should be used in model.

Table 3. Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-22.92365	NA	2.00e-08	2.137403	2.470454	2.239220
1	93.23331	165.9385*	1.85e-10*	-2.659522*	0.004887*	-1.844986*

Notes: * indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

We select optimal lag for our model on the on the basis of lowest value of H-Q Criterion. After selecting lag length criteria, we evaluate long term dynamics of variables under consideration.

Table 4. ARDL Bounds Testing Approach

Estimated Models: $ERR_t = f(Sizet, Opent, Inf_t, Fert, KaOpent, FBGDP_t)$				
Optimal lags	(1,0,0,0,0,0)			
Statistics for W	28.4872 *			
Statistics for F	4.0696 *			
	Critical Bounds For F- Statistics		Critical Bounds For W- Statistics	
	Lower Critical	Upper Critical	Lower Critical	Upper Critical
Significance Level	Bound	Bound	Bound	Bound

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5 per cent	3.0274	4.5846	21.1915	32.0925
10 per cent	2.5055	3.8412	17.5385	26.8881
DIAGNOSTIC TESTS				
Serial Correlation	1.7289[.189]		R^2	.54368
Functional Form	.10935[.741]		Adjusted - R^2	.38397
Normality	7.7463[.021]		F – Statistics	3.4042
Heteroscedasticity	.49442[.482]		DW – Statistic	2.2808

Notes: Asterisks are the indication of significance of values, ***, **, and *, and show significance at 1%; 5% and 10% levels respectively. The Probability Values are given in { } brackets

After lag length criteria, now we are going to explore long run relationship among exchange rate regime and its determinants by using latest co-integration approach. As the null hypothesis of the test is “No co-integration” and it only be rejected only if calculated value of F- statistics is higher than upper critical bound value. The above Table reveals that the calculated value of F-statistics higher than its upper critical bound at 10% level of significance: $4.06 > 3.84$ so the null hypothesis is rejected and alternative hypothesis has been accepted and value of W-statistics is also higher than its upper critical Bound at 10% level of significance: $28.48 > 26.88$. It means the model has long-run relationship, in other words, exchange rate regime has stable and long run link with independent variables. The diagnostics reveal that there is no problem with Heteroscedasticity and the error term is normally distributed. Serial correlation and the functional form of model are also correct.

ARDL (1, 0, 0, 0, 0, 0) selected based on Schwarz Bayesian Criterion

All variables except exchange rate regime and inflation are taken in Natural logarithmic form. ERR_t is dependent variable, while $LSIZE_t$, $LOPEN_t$, INF_t , $LFER_t$, $KaOpen_t$, $FBGDP_t$ are independent variables. Long run and short run results are given below:

Table 5. Long Run and Short Run Dynamics

<i>Estimated Long Term Coefficients using the ARDL Approach</i>			<i>Error Correction Representation for the Selected ARDL Model</i>		
<i>Dependant Variable:ERRt</i>			<i>Dependant Variable:ΔLERRt</i>		
Name of Variables	Coefficient	P-value	Name of Variable	Coefficient	P-value
$LSIZE_t$	-.28665	[.341]	$dLSIZE_t$	-.26393	[.353]
$LOPEN_t$	.28779	[.073]*	$dLOPEN_t$	.26498	[.052]*
INF_t	-.064476	[.024]**	$dINF_t$	-.059365	[.021]**
$LFER_t$	.89984	[.024]**	$dLFER_t$	.82852	[.017]**
$KaOpent$	-.18183	[.532]	$dKaOpent$	-.16742	[.524]
$FBGDP_t$	.023024	[.283]	$dFBGDP_t$	.021199	[.240]
C	1.2280	[.564]	ECM_{t-1}	-.92074	[.000]***
<i>Diagnostics for ECM</i>					
R -squared	.69685		Mean Dependent Variable	-.0089286	
Adjusted R -squared	.59074		S.D. Dependent Variable	.26995	
S.E. of Regression	.17270		Akaike Information Criterion	6.1546	
Sum Squared Residual	.59647		Schwarz Bayesian Criterion	.82583	
Log Likelihood	14.1546		Durbin-Watson Stat	2.2808	
F-statistic	6.5676		Prob. Value (F-statistic)	[.000]	

Notes: *, **, and *** reveals significance level of test statistic at 10%, 5% and 1% respectively.

The results show that coefficient of openness of economy is positively related to exchange rate regime and its impact on regime selection is statistically significant. Positive sign of openness push regime towards fixed because in this study “1” indicates fixed and “0” stands for flexible regime same as Karass (2012). The magnitude of coefficient shows that one percent change in openness push economy 0.287 percent in favor of fixed regime. So as the magnitude of coefficient is strong it would have more influence on exchange rate regime determination. Our results

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match with Aliyev (2015), (Walker, 2003), (Worrell *et al.*, 2000), Leblang (1999) and Malvin (1985).

The coefficient of SIZE of economy is negative but statistically insignificant. It does not matter whether it has large size of economy or small that can determine the exchange rate regime. The magnitude of coefficient is also very small; it can be interpreted as one percent change in size of economy can change 0.286 percent towards fixed regime. However, size of economy influences the exchange rate and also matter for regime determination. In case of other developed countries number of studies support this negative relationship for instance Aliyev (2015), (Walker, 2003), (Worrell *et al.*, 2000), and Malvin (1985). These findings of Size and openness are consistent with theory of optimal currency area (OCA).

Inflation is negative and statistically significant. Coefficient indicates one percent increase in inflation force exchange rate regime change 0.064 percent in flexible direction. It is difficult to maintain stable exchange rate regime under higher consumer prices. In flexible regime countries have to bear increasing inflation rate but if an economy requires low inflation rate than country has to adopt fixed exchange rate regime. If a country has historically experienced of high inflation than it can get benefit from peg (Yagci, 2001) but weak central bank faces many hurdles in maintaining inflation at low level. Generally, Pakistan did not face high inflation so the results are also in line with intuition that movement toward flexible regime is better. Studies such as Aliyev (2015), (Worrell *et al.*, 2000) and Malvin (1985) support negative sign of inflation but contrast with Leblang (1999).

The coefficient of foreign exchange reserve is positive and statistically significant. Magnitude of coefficient is very strong showing that a one percent increase in FER will push regime 0.899 percent towards fixed. In other words we can say country with more foreign exchange reserves has more likelihood to adopt fixed regime. Literature suggests if country has high ratio of foreign exchanges to GDP then fixed exchange rate regime is preferable otherwise opposite is best. Pakistan, generally, does not hold abundant foreign exchange reserves due to consistent trade deficit thus to adopt and maintain fixed exchange rate regime is difficult for Pakistan.

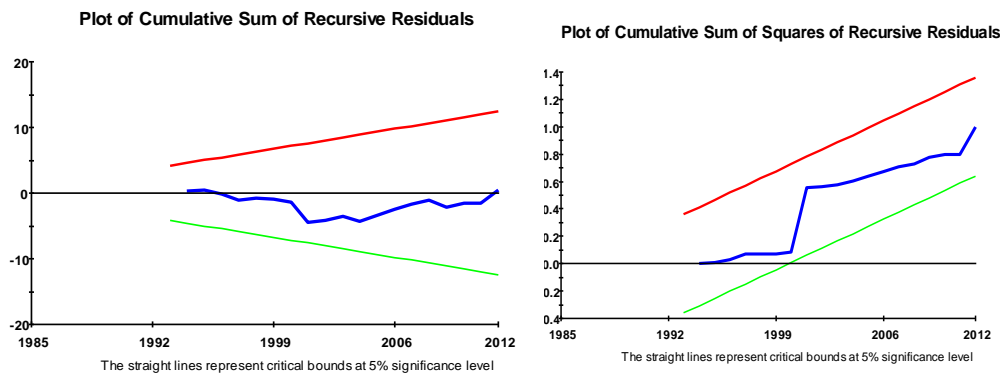
KaOpen index measures country's degree of capital account openness. Here Capital account openness appears with insignificant and negative coefficient, for this analysis it means financial openness (KaOpen) is not affecting choice of exchange rate regime, but the negative sign having indication toward flexible. These results may be due to low level of openness furthermore, there is almost no variation in Chin-Ito Index.

Interestingly, Long run and short run dynamics are qualitatively same. These three variables $dLOPENT$, $dINFt$ and $dLFERT$ are significant in short run. In short run, our main focus is the value of ECM which is significant and negative as required. The coefficient authenticate that 92 percent of the divergence will converge to equilibrium in one year.

5.2. Diagnostic of CUSUM and CUSUM squares

Stability test: Stability of long run coefficient has been shown with the help of cumulative sum of recursive residuals (CUSUM) of cumulative sum of squares recursive residuals (CUSUM SQUARE) test.

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The diagnostics of CUSUM and CUSUM squares confirm the stability of our model at conventional 5 percent level. This it can be safely said there is no structural break in the sample period under analysis which is more suitable for policy decisions.

6. Conclusion

This study has empirically analyzed economic, financial and political determinants of exchange-rate regime in Pakistan over the period of 1984 to 2012. Using “Auto Regressive Distributed Lagged” approach the study confirms that openness, foreign exchange reserves, rate of inflation and financial development are important determinant of exchange-rate regime for economy having features like Pakistan.

Our empirical findings suggest that appropriate regime for Pakistan is managed float au lieu de fixed one. Interestingly, the results are mixed so the absence of any clear-cut conclusion demands more caution while deciding about regime. Both extreme ends – peg and free float – seem unfavorable for Pakistan. Openness and foreign exchange reserves are in favor of regime towards fix but at the same time inflation appears with negative sign, it is the indication towards flexibility. The results are alike Hussain (2006) as his study also informs that peg (hard fix) is not suitable for economy with Pakistan’s characteristics and increase in regime flexibility would likely to improve its economic performance. The results do not change when we add governance and political stability for robustness check.

We reiterate that economic theories are not sufficient to give confirm answer to policy makers in prediction of appropriate regime. And there is no single theoretical approach that can claim of its victory and superiority over another (Ouchen 2013). Some studies find support from OCA approach and others acquire evidence from “Bipolar view and Trade off” (Fisher, 2001). The choice of appropriate exchange-rate regime is not clear-cut; it is much complicated, continuous revision is required in empirical and theoretical studies.

Appendices

Table 6. Variables and Transformation

Variables	Names of the Variables	Transformation	Data Source	Data Range
ERR_t	Exchange Rate Regime	[See Karass 2012]	PWT 8.0 and IFS	1984 – 2012
$LSIZE_t$	Size of Economy	LN [Real GDP]	WDI [2013]	1984 – 2012
$LOPEN_t$	Trade Openness	LN[Imports +Exports/Real GDP]	WDI [2013]	1984 – 2012
INF_t	Inflation	Consumer Price Index	WDI [2013]	1984 – 2012
$LFER_t$	Foreign Exchange Reserves	LN [Foreign Exchange Reserves Gold excluded]	WDI [2013]	1984 – 2012
$KaOpen_t$	Capital account openness	Ito-Chin Methodology	Ito-Chin [2013]	1984 – 2012
$FBGDP_t$	Fiscal Shocks	[Fiscal Budget Deficit to GDP]	SBP	1984 – 2012

Table 7. Robustness check

Name of Variables	1 st Model [Prob.]	2 nd Model Prob.]	3 rd Model [Prob.]	4 th Model [Prob.]	5 th Model[Prob.]
$LSIZE_t$	-0.20568[.463]	-0.25733[.429]	-0.45780[.174]	-0.058348[.907]	-0.45243[.132]
INF_t	-0.70071* [.027]	-0.066917* [.018]	-0.064306* [.029]	-0.063485* [.016]	-0.062554* [.057]
$LFER_t$	0.97730* [.030]	0.91263* [.022]	0.87535* [.035]	0.88703* [.017]	0.86915* [.061]
$LFBGDP_t$	0.021020[.333]	.020842[.331]	0.014265 [.511]	0.020846[.292]	0.009532 [.663]
$LOPEN_t$	0.29436* [.074]	0.28552* [.073]	-----	0.27207* [.907]	-----
$GOVER_t$		-0.13576[.875]	-0.0070969[.994]		
PS_t				-0.47968[.708]	
LFD_t					1.2893* [.069]
<i>Optimal Lags</i>	1,0,0,0,0,1	1,0,0,0,0,0,0	1,0,0,0,0,0	1,0,0,0,0,0,0	1,0,0,0,1,0
<i>DAIGNOSTIC TEST</i>					
R^2	0.51	0.53	0.43	0.51	0.54
<i>F-Statistic</i>	3.3690	3.2828	2.7062	3.2790	3.7123
<i>DW-Statistic</i>	2.26	2.28	2.10	2.28	2.10
<i>ECM(-1)</i>	-0.90	-0.93	-0.94	-1.00	-0.82
<i>Serial Correlation</i>	2.349{.125}	1.693{.193}	0.906{.341}	2.123{.015}	0.417{.518}
<i>Functional Form</i>	2.202{.138}	0.256{.613}	0.016{.896}	0.548{.459}	0.010{.919}
<i>Normality</i>	6.226{.044}	7.88{.019}	3.734{.155}	6.15{.046}	1.154{.562}
<i>Heteroscedasticity</i>	0.842{.359}	0.405{.524}	1.271{.259}	0.4140{.52}	2.677{.102}

Notes: * indicates that particular variable is significant in regression and the values in the brackets{ } are P-values

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