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The Financial Integration: An Empirical Analysis of Pakistan and UK

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Abstract

In this paper, integration of financial markets in Pakistan with those in United Kingdom, have been investigated. For this purpose we have tested the presence of co integration among Call money Rates (CMR) and t-bills rates (TBR) of Pakistan and UK.

Our data consist of monthly rates of the entire domestic (Pakistan) and foreign (United Kingdom) variables. Variables selected for analysis are T-Bill Rate (TBR), Call Money Rate (CMR), Exchange Rate (Rs/$) and London Inter Bank Offered Rate (LIBOR). The sample period is 1st Jan 2000, to 31st Dec 2008, which includes 96 monthly observations for each variable used. All the variables are expressed in Natural Logarithm. The sources for data collection are State Bank of Pakistan (SBP), Economic Survey of Pakistan, and IMF CD-2009.

In this study we use co-integration approach to examine the integration of returns in both domestic and foreign markets. One of the pre-requisites for undertaking the co-integration framework is that the variables that are expected to have long-run relationship should have the same order of integration: For short run causality, we have estimated Vector Error Correction model.

Results obtained from exchange rate are not integrating with short-term. Based on co-integration tests, the empirical results find co-integration among four variables (t-bill rate Pakistan & call money rate Pakistan, call money rate Pakistan & call money rate United Kingdom and t-bill rate Pakistan and t-bill rate United Kingdom). Vector error correction model suggested long run and short run relationship between all variables. These results thus recommend that there is a link amongst domestic and foreign market.

The paper is an original work and emphasizes whether the financial liberalization undertaken in Pakistan since 2000 has created integration among domestic and foreign market. Further to analyze if there is any relation or co-movement among the rate of returns in Pakistan and UK.

Keywords: T-bills rates; call money rates; financial markets; Pakistan; UK.

1. Introduction

Integration of financial market has significantly increased during the period of 1980s and 1990s. Wave of recent reforms and internationalization in emerging markets has enhanced linkage within various sectors of national and international markets. Some of the key factors behind this change are increased globalization of investment in order to get higher rates of return and diversification of risk internationally. Several researches are conducted on financial integration.

Investigation by Obstfeld (1994) explains that now the admittance towards capital markets has raised the prospects of Portfolio Diversification for the investors and also provides them with more potential opportunities to obtain a higher risk-adjusted rate of return. International Risk Sharing also leads economies towards plain consumption pattern during the periods of adverse shocks, better growth and welfare benefits. Strong integration is present in domestic call money market with the LIBOR and robust co-movement between domestic foreign exchange market and LIBOR Jain & Bhanumurthy (2005). High saving investment correlation indicate low capital mobility was determined by (Feldstein 1983, Dooley et.al. 1987, and Bayoumi 1990). Many direct and indirect methodologies were used which also concluded that capital is not perfectly mobile Monadjem, M. (1990) , further study by Haque and Montiel (1994) gauges the level of monetary autonomy in struggling economies which resulted that the capital mobility level is quite greater.

Pakistan also implemented policies similar to various other emerging economies, and financial sector reform and liberalization as early as the 1990s. Transformation and reform factors implemented a positive effect on the economy, which improved credit rating by appreciation of the currency. As a result of these reforms and deregulation of many sectors of the economy, the movements of important financial market indicators became reflective of market forces. Dynamic linkage among exchange rate, stock and money markets was determined by Khalid & Rajaguru (2006).

A well integrated financial market with rest of the nations in world can help country to level its consumption pattern and to enhance their productivity by attracting large number of investors. Developing and emerging nations can attain high level economies of scale, growth and better improved living standard for people.

1.1 Objectives of the Study

The primary objective of the study is to investigate whether the financial liberalization undertaken in Pakistan since 2000 has created integration among domestic and foreign market. Further to analyze it there is any relation or co-movement among the rate of returns in Pakistan and UK.

This study is structured as follows: section two discusses literature review related to the financial integration. Third section consists of theoretical framework followed by fourth section about data, model and methodology description. Data interpretation and results will be discussed in the fifth section. Sixth section concludes of the paper followed by the references.

2. Literature Review

Financial Markets integration is a process of mingling markets which makes them enough potent to allow union or risk adjustment on assets possessing related maturity. The

financial growth is evident and admitted around the world which is resultant from deregulation, globalization and enhancement in information and technology sectors. Sundarajan *et al,* (2003) clarifies that the hierarchal structure of financial markets portray that domestic financial markets are at top and then followed by global and regional markets. Moreover, the advantages of domestic financial markets are difficult to match as compared to international financial markets. Now the central banks of different countries across the globe are struggling to expand financial markets especially because of several crises faced during 1990s.

Trends were compared in financial integration within Asia with those in industrialized countries and other regional groups by Borensztein and Loungani (2011). Declines in cross-country dispersion in equity returns and interest rates suggest increased Asian integration, with the process interrupted by crises and global volatility. Cross-border equity and bond holdings have also increased, but Asian countries remain considerably more financially integrated with major countries outside the region than with those within the region.

Chan and Baharumshah (2013) explored a joint investigation of the international parity conditions between China and her 13 major trading partners in the Asia Pacific. The findings reveal that first, RIP holds stronger than PPP among APEC-China. Second, both parities tend to hold better as one move to the recent years, attributed not only to the financial liberalization process among APEC economies, but also to the Chinese trade policy and the regional commitment for the ASEAN+3+2+1 co operation. Gianni and Luciana (2012) examine the distinct impact of financial integration and globalization on several dimensions of real activity. They find that financial integration has progressed significantly worldwide, particularly in emerging markets, as well as within regions; advances in financial integration predict better growth prospects.

Study by Levine (2001) proves that international financial integration has a positive impact on overall productivity. The financial productivity also leads to the financial liberty which broadens the depth and breadth of financial markets. It leads to the increased effectiveness level of financial intermediation processes. It is obtained because of reduced costs and increased profits which are related with monopolistic and centralized markets. Benefits of Financial market integration also create some risks and entails costs. Fear associated with integration were heightened by a series of several financial crises – including peso crisis of December 1994 in Mexico, collapse of the Thai Baht prompted the Asian crisis in July 1997, and August 1998 Russian crisis. Study conducted by Ayuso & Blanco (2001) suggested that during the nineties there has been an increase of the level of market integration between stock markets of different nations. Investigation conducted by Bhoi and Dhal (1998) studied this issue by using monthly data up to 1997. This study also explained that domestic financial markets are integrated with each other but it is not the case when we check their integration with international markets.

In most of the countries around the world capital account liberalization slowed down because of the fact that international financial integration which inflates capital inflows encourages the appreciation of real exchange rates. According to Dornbusch and Park, (1994) the analysis of financial markets also brings out another policy aspect which shows increasing significance of foreign interest rates in the formation of domestic rates. The level of integration not only influences the behavior of domestic rates but also has

serious impacts on the decisions of monetary authorities towards independent monetary policies formation. Dynamic relationship between South Asian Market (India, Sri Lanka and Pakistan) and with major developed markets (US, UK and Japan) was investigated by Lamba (2003). Results indicated that the large developed equity markets influence Indian market and this relationship has build up in recent time. India does not influence the stock markets of Sri Lanka and Pakistan; rather Pakistan and Sri Lanka stock markets are relatively isolated. Comparison among emerging countries and developed countries financial integration was done by Tambi (2007). USA, Canada, UK, Singapore, Malaysia and India were selected for the purpose of this investigation. Study specifies world equity market in two divisions; where developed nations and emerging markets are in separate groupings. India was found positively correlated with all the markets, but this relationship is not highly positive. Casual relationship between monetary variables and equity return was determined by Hasan & Javed (2009).Variable used were treasury bills, foreign exchange rate and the consumer price index. Results reveal that there is negative relation of exchange rate on equity returns. Similarly interest rate also has negative impact on equity returns. The eras of developments in financial market of Pakistan can broadly be segregated into following segments, 1947-1960, 1961-1970, 1971-1990 and 1991 to date periods. The Private Sector development was dominant in the period of 1947-1960. This development was overtaken by Public Sector during the years 1961-1970. The era of 1971-1990 shows further enhancement of public sector and the shrinking of private sector as all the banks were publicized.

Liberalization stance in Pakistan was witnessed 1990 onward, when Government supported market Securities come in to existence along. After initiation of long term securities in year 1992 market long term yield curve started giving opportunity. Private Sector also brought many instruments which became reality in 1995 i.e. the issuance of first TFC. The actual growth became rapid in year 2000 with the introduction of long term instruments which were Pakistan Investment Bonds (PIBs). Under the umbrella of President Pervez Musharraf government, in 1999 onward shift occurred in from of state ownership of several industries and heavy regulation of the shift of private economy to privatization of a few state industries under heavy regulations. But still, slack in fiscal and monetary policies, infrastructural shortage, a poorly developed human resource support, and persistent market twist that benefit small privileged landowners, industrialists, and others undercut economic potential. Several factors affected the economic growth during this era firstly sensitive issue of Pakistan and India relations during 2000-2002, military tensions across the border with India where a million troops on the border was on vigilant, giving predictions of approaching (potentially nuclear) war. Secondly incident of history, post 9/11 armed forces attack in neighborhood Afghanistan, brought a significant arrival of immigrant from that state. Thirdly natural tragedy in 2005 affected the building economy 2005 earthquake across the northern areas of Pakistan. Regardless of these unfavorable actions, Pakistan's market showed increasing trend, and financial development picked up the pace towards the closing stages of phase. This flexibility has escorted to a transform view of several international institutions for admiring Pakistan's performance and economy while facing all adverse conditions during these years.

3. Theoretical Framework

In order to investigate whether returns are integrated in foreign and domestic market we have used the co-integration approach. There should be the same order of integration between the variables that are expected to have long run association and it is one of the pre-requisites for undertaking the co-integration framework:

$$i_{t,k} = \alpha + \beta i*_{t,k}$$

Where,

I and i*= domestic and foreign market returns. The co-relation matrix is used to check the negative or positive relationship among the variables.

In order to find co-integration among financial markets Pakistan and United Kingdom we selected following TBR & CMR of bother countries, Exchange Rate (Rs/$) and LIBOR from year 2000-2008. Similar variables are investigated by (Hye *et. al.,* 2009; Hasan & Javed 2009). Treasury Bills (T-bills) are the most money-making market security and short-term securities that are grown-up in one year or less from their issue date. Such securities are issued with three-month, six-month and one-year maturities. T-bills are among the one of essential way government raise money from the public. The only negative aspect to T-bills is that returns are not great because Treasuries are unusually safe. Call money Rate (CMR) is a short-term money market that lend at interbank rates to large financial institutions, such as mutual funds, banks and corporations to borrow and lend money at interbank rates. The loans in the CMR are very short, usually lasting no longer than a week and mostly used to help banks gather reserve requirements. LIBOR or the T-bill United Kingdom (TBRUK) yield plus basis points are used as reference rate by most of the swaps and floating rate contracts on the global dollar. Similar variables are used by several studies conducted by (Bhoi & Dhal 1998; Jain & Bhanumurty 2005).

4. Hypothesis of the Study

In order to investigate the co-integration in financial market of of Pakistan and United Kingdom financial market following hypothesis has been developed.

H0: No co-integration between CMR of both countries

H1*: There is co-integration between CMR of both countries*

H0: No co-integration between TBR of both countries

H1*: There is co-integration between TBR of both countries*

H0: No co-integration between TBRPAK and LIBOR

H1: *There is co-integration between TBRPAK and LIBOR*

H0: No co-integration between CMRPAK and LIBOR

H1: *There is co-integration between CMRPAK and LIBOR*

H0: No co-integration between ER of Pakistan and LIBOR

H1: *There is co-integration between ER of Pakistan and LIBOR*

H0: There no is co-integration between CMR and TBR of Pakistan

H1: *There is co-integration between CMR and TBR of Pakistan*

5. Data and Methodological Approach

Our data consist of monthly rates of the entire domestic (Pakistan) and foreign (United Kingdom) variables. Variables selected for analysis are T-Bill Rate (TBR), Call Money Rate (CMR), Exchange Rate (Rs/$) and London Inter Bank Offered Rate (LIBOR). The sample period is 1st Jan 2000, to 31st Dec 2008, which includes 96 monthly observations for each variable used. All the variables are expressed in Natural Logarithm. The sources for data collection are State Bank of Pakistan (SBP), Pakistan Economic Survey, and IMF CD-2009. All the estimations for tests are done in E-Views (6).

5.1 Unit Root Testing for Stationarity

Notion of a spurious regression was introduced by Granger-Newbold (1974). According to researchers macroeconomic variables are in general non-stationary and involving variables in regressions at different levels of variables, the average significance tests were frequently misleading. In order to investigate data in time-series the first step is to resolve the Stationarity problem of data and that shocks are only temporary and will revert to their long run mean. Time series with non-Stationarity has a trend and do not return to their mean, so it is always advised to convert these series into stationary. Similarly dependent and independent variable in a classical regression model should be free on non-Stationarity and errors to have zero mean and finite variance. Data having time series property is often examined through widely used tests Augmented Dickey Fuller, Phillip-Perron and KPSS. Unit root test are conducted on the logarithm of the time series data.

5.2 Co-integration Analysis

As discussed earlier that macroeconomic variables are normally non-stationary, so if two time series variables are non-stationary, but co-integrated, then at any point in time the two variables may drift apart. But yet there will be a tendency for them to retain a reasonable proximity to each other. In our case, the estimated model is the relationship that tends to tie together the six non-stationary variables in the long run. There may be more than one co-integrating relationship among co-integrated variables. Johansen test provides estimates of all such co-integrating equations and provides a test statistic for the number of co-integrating equations. VAR representation below is used for this method:

$$Xt = \mu + \Pi\, Xt\text{-}1 + \Pi\, Xt\text{-}2 + \Pi\, Xt\text{-}3 + \ldots\ldots\ldots\ldots\ldots\ldots + \Pi\, Xt\text{-}k + \varepsilon t$$

There are two tests, the Trace statistic, which is more reliable and the max Eigen value statistic. Both indicate co integration at the 5% level.

5.3 Vector Error Correction Model

After checking co-integration existence between both markets, if co-integration is observed in variables next step is to model them as a vector error correction model (VECM) to analyze both short and long run linkages between domestic and foreign interest rates and exchange rates. On the other hand, if these two markets are not co-integrated then they will be modelled as VECM as well. The rationale behind VECM is that if two variables are co integrated then long run association is present between them, although in short-run they can be in disequilibrium.

6. Empirical Results

Before discussing the results evaluated through different techniques, procedures and models if we just view the following Figure 1, Figure 2, Figure 3 we can note some

interesting results. In figure 1 all the variables are plotted to check any long run movement, it shows some relationship across the years. By analyzing figure 2 we determined very close linkage in the domestic interest rate in case of both TBR and CMR. They are following almost same trend across the year which shows there is strong relationship among interest rate. Exchange Rate doesn't show any visible relationship but yet so some similar fluctuation last years.

Figure 3 show's the similar result as shown in case of domestic market trend. There is strong interlinkage between TBR and CMR of foregin market . And collectively both variables's are having close co-movement in trend with LIBOR.

Figure 1: Trends in Domestic & Foreign Interest Rates

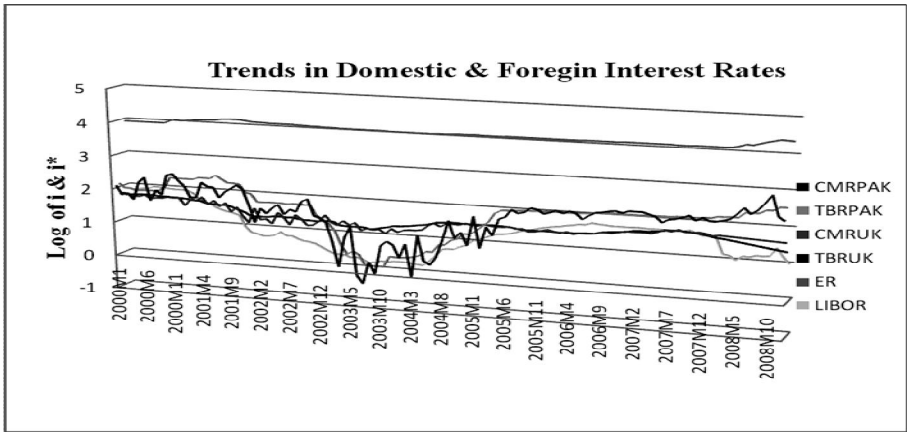


Figure 2: Trends in Domestic Rates

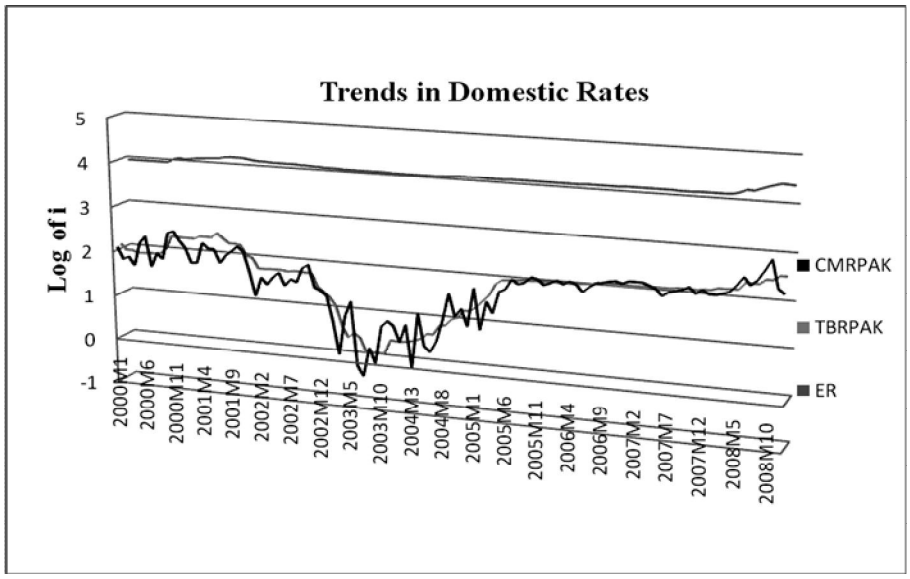
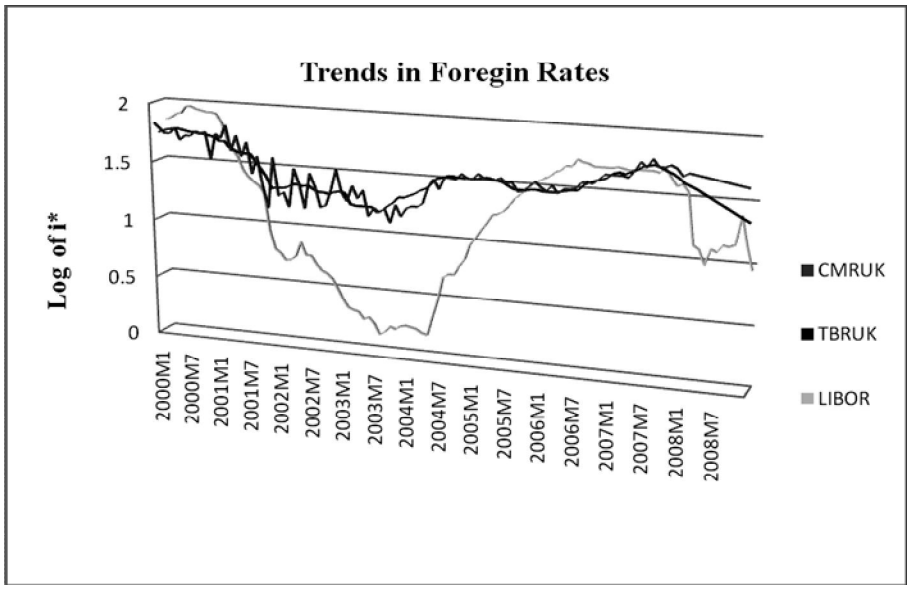


Figure 3: Trends in Foreign Rates



6.1 Correlation Analysis

Several methods are used to test co-integration among different variables, highly co-integrated markets should result highly correlated interest rates. In table 1 co-efficient of correlation between all possible pairs of variables are shown. Results indicated that call money rate of Pakistan is positive and highly correlated with all other variables except exchange rate where degree of correlation is low. Exchange rate is negatively correlated with all variables except t-bill rate of Pakistani where degree of correlation is low but positive. Remaining all variables t-bill rate of both countries, call money rate of United Kingdom and London Interbank Offered Rate are highly positive correlated.

Table 1: Coefficient of Correlation

Rates		Pakistan		United Kingdom		Other	
		CMR	**TBR**	**CMR**	**TBR**	**ER**	**LIBOR**
Pakistan	**CMR**	1.000					
	TBR	0.909	1.000				
United Kingdom	**CMR**	0.609	0.665	1.000			
	TBR	0.624	0.647	0.901	1.000		
Other	**ER**	0.228	0.290	-0.110	-0.202	1.000	
	LIBOR	0.786	0.816	0.834	0.881	-0.080	1.000

This correlation matrix show high correlation but for caution it's not necessary neither sufficient condition to prove high level co integration between the market of both countries. Variable used are interdependent thus correlation among them is high in certain cases but we will ignore multi-collinearity, also we will not be using OLS and T-Statistics. As revealed from result that the correlation coefficients for majority variables

were low (all < 0.7500) multi-collinearity does not seem to pose a serious problem in our study as high degree of collinearity will not bias the estimates.

6.2 Unit Root Test

After correlation matrix we perform further econometric tests to determine if the two markets are interlinked over the sample period. So first we perform a unit root test on all variables to determine the integration order of the series. Results in Table 2 indicate that data is non-stationary at levels using Augmented Dickey Fuller Test (ADF) with and without intercept, similarly with and without trend as well. By changing trend and intercept we can also get stationary series. Further test was conducted at first difference to make data stable. Result is Table 3 revealed that all variable in data series are stationary at first difference using ADF test with both trend and intercept.

Table 2: Unit Root (ADF) Tests at Levels

Model	LIBOR	CPAK	TPAK	ER	CUK	TUK
With Trent & Intercept	-1.513	-2.18	-1.644	-0.947	-1.9	-1.95
With Intercept and no Trend	-2.7067	-1.98	-1.516	0.0198	-1.77	-1.83
With no Intercept & Trend	-1.33	-0.51	-0.151	2.053	-0.1959	-0.661
Result	Unit Root Exist	Unit Root Exist	Unit Root Exist	Unit Root Exist	Unit Root Exist	Unit Root Exist

Table 3: Unit Root Test on First Differences

Model	ΔLIBOR	ΔCPAK	ΔTPAK	ΔER	ΔCUK	ΔTUK
With Trend & Intercept	-7.077	-14.88	-7.101	-7.53	-9.48	-5.71
Result	NO Unit Root	NO Unit Root	NO Unit Root	NO Unit Root	NO Unit Root	NO Unit Root

6.3 Co-Integration Test

Next step is to determine if the variables in data series have any association. The co-integration analysis results are described in Table 4 to Table 9 and give a mix results. There is co-integration among few variables at 95% Confidence Interval.

Table 4: Co-integration between CMR of Both Countries

H1	H0	Trace Test		Max Eigen value	
		Trace Statistic	95% Critical Value	M-E Statistic	95% Critical Value
r=0	r>=1	17.69	15.49	16.31	14.26
r<=1	r=2	1.38	3.84	1.38	3.84
The normalized co-integrating equation is 1.0 CMRPAK + 3.3977 CMRUK = εt					

Table 5: Co-integration between TBR of Both Countries

H1	H0	Trace Test		Max Eigen value	
		Trace Statistic	95% Critical Value	M-E Statistic	95% Critical Value
r=0	r>=1	17.09	15.49	12.52	14.26
r<=1	r=2	4.57	3.84	4.57	3.84
The normalized co-integrating equation is 1.0 TBRPAK + 6.3943 TBRUK = εt					

Table 6: Co-integration between TBR of Pakistan and LIBOR

H1	H0	Trace Test		Max Eigen value	
		Trace Statistic	95% Critical Value	M-E Statistic	95% Critical Value
r=0	r>=1	11.21	15.49	7.50	14.26
r<=1	r=2	3.70	3.84	3.70	3.84
The normalized co-integrating equation is 1.0 TBR + 0.3046 LIBOR = εt					

Table 7: Co-integration between CMR of Pakistan and LIBOR

H1	H0	Trace Test		Max Eigen value	
		Trace Statistic	95% Critical Value	M-E Statistic	95% Critical Value
r=0	r>=1	14.25	15.49	9.66	14.26
r<=1	r=2	4.58	3.84	4.58	3.84
The normalized co-integrating equation is 1.0 CMRPAK + 1.0235 LIBOR = εt					

Table 8: Co-integration between ER of Pakistan and LIBOR

H1	H0	Trace Test		Max Eigen value	
		Trace Statistic	95% Critical Value	M-E Statistic	95% Critical Value
r=0	r>=1	9.41	15.49	8.69	14.26
r<=1	r=2	0.72	3.84	0.72	3.84
The normalized co-integrating equation is 1.0 ERPAK + 2.4675 LIBOR = εt					

Table 9: Co-integration between CMR & TBR of Pakistan

H1	H0	Trace Test		Max Eigen value	
		Trace Statistic	95% Critical Value	M-E Statistic	95% Critical Value
r=0	r>=1	26.34	15.49	25.92	14.26
r<=1	r=2	0.42	3.84	0.42	3.84
The normalized co-integrating equation is 1.0 CMRPAK + 0.8994 TBRPAK = εt					

Two lags are chosen using Akaike (AIC) and Schwarz (SC). After performing the johansen's co-integration it may be noted that there is presence of co integration between call money rate and t-bill rate of Pakistan for both trace and max-Eigen value test. Similar results are determined for the call money rate of both nations where co-integration exists for both tests as well. Trace test indicate co integrating vectors between t-bill rates of both countries while results from max Eigen value are insignificant. Whereas it's determined that there is no co integration between call money rate Pakistan, t-bill rate Pakistan, Exchange Rate and London Interbank offered rate at 95% confidence interval but it was observed that weak co-integration exist at 90% confidence interval among these variables. As compare to the international market the domestic short term money market is more integrated. Foreign and domestic foreign exchange market lacks robust integration. The reason for this may be the reforms of financial market that are initiated.

6.4 Vector Error Correction Model

Since the entire variables in the series are not co-integrated we can, test any possible linkage between all the variables during the sample period by using VECM. Long and short run relationship can be identified through this estimation. As this Results suggested for the variables are reported in Table 10 and 11.

From the View, Representations option we determined that the long-run association exists among interest rates of domestic and foreign. The coefficient on all the variables for domestic interest rate and exchange rate in the co integrating vector is 1as it should be shown in the Table 10.

Table 10: Vector Error Correction Model for Domestic and Foreign Interest Rates

Error Correct	D(CPK)	D(CUK)	Error Correct	D(TPK)	D(TUK)	Error Correct	D(CPK)	D(TPK)
Co-integration Equation 1	-0.3	0.02	Co-integration Equation 2	-0.054	0.003	Co-integration Equation 3	-0.657	0.036
	-4.04	0.952		-3.241	0.877		-4.649	0.756
D(CPK(-1))	-1.276	-1.619	D(CPK(-1))	1.518	0.044	D(CPK(-1))	0.803	0.018
D(CPK(-2))	0.343	-1.217	D(CPK(-2))	0.889	-0.914	D(CPK(-2))	0.291	-0.686
D(CUK(-1))	-0.956	-5.357	D(TUK(-1))	-0.293	4.539	D(TPK(-1))	0.927	1.846
D(CUK(-2))	0.067	-1.888	D(TUK(-2))	0.787	1.995	D(TPK(-2))	0.44	1.996

The adjustment coefficient on co integration equation1 for the call money rate Pakistan is negative as it should be and quite rapid 30% a month, the adjustment coefficient on call money rate United Kingdom positive, as it should be, but quite small just 2% a month and is insignificant as well. It means that about 30% of disequilibrium corrected each month by change in call money rate United Kingdom. And similarly there are 30% chances that if disequilibrium is created it will return back to its original equilibrium position in short-run after deviation. Lagged call money rate United Kingdom is insignificant in the call money rate Pakistan equation, but lagged call money rate United Kingdom is significant in call money rate Pakistan equation for short run. Further coefficient on co integration equation 2 for the t-bill rate of both countries its negative as expected but is very low for both the countries 5.4% and 0.3% for Pakistan and United Kingdom respectively where adjustment for United Kingdom is insignificant as well. So chances of disequilibrium correction are very low for both the nations and return from deviation chances are also very low. Further lagged t-bill rate United Kingdom is insignificant in the t-bill rate Pakistan equation but lagged t-bill rate United Kingdom is significant. Same result is obtained for lagged London interbank offered rate is insignificant in the t-bill rate Pakistan equation, but lagged t-bills rate is significant in London interbank offered rate equation for short run. The adjustment coefficient on co integration equation 3 for the t-bill rate Pakistan quite low 0.6% a month and is insignificant, the adjustment coefficient on London interbank offered rate is negative but significant and small just 2.1% a month. This means effect across both countries in co integration equation 4 is insignificant. About 21% of equilibrium corrected each month by change in London interbank offered rate according to co integration equation 4 and about 2.1% of equilibrium corrected each month by change in London interbank offered rate. Co-efficient is negative as expected for call money rate Pakistan and significant as well. So 21% chances to return on equilibrium position are there after deviation from original position. In lagged equation both are insignificant which means London interbank offered rate effect on exchange rate Pakistan is insignificant and vice versa. Co integration equation 5 presents the similar results as for the call money rate Pakistan with London interbank offered rate. Finally in co integration equation 6 which is presents relations between domestic markets of call money rate and t-bill rate Pakistan where 65% of equilibrium corrected each month by change in t-bill rate. So chances to return at equilibrium position after deviation are high. Whereas for t-bill rate its 3.6 % only which

is very low. Lagged t-bill rate is insignificant in the call money rate Pakistan equation, but lagged t-bill rate is not highly significant in call money rate Pakistan equation for short run.

7. Conclusion

The results indicate that across the nation there is co-integration between call money rate and T-Bill rate, which verifies that a general stochastic movement among the returns of domestic and foreign market is present. Results obtained from exchange rate are not integrating with short-term market as determined by the previous study of Khalid & Rajaguru (2006). This study investigates whether any co-integration exist among the sum of the foreign and domestic variables. Moderate frequency data (monthly observations for the exchange rate and interest rate) and three different empirical testing procedures are used to determine if both the markets are co-integrated. Based on co-integration tests, the empirical results find co-integration among four variables (t-bill rate Pakistan & CMR Pakistan, CMR Pakistan & CMR UK and t-bill rate Pakistan and t-bill rate United Kingdom). Vector error correction model suggested long run and short run relationship between all variables. These results thus recommend that there is a link amongst domestic and foreign market. It is interesting to note that our results are consistent with the theoretical hypothesis mentioned in Section 1 of this paper. There summary is given in Table 11:

Table 11: Summary of Results

Items	Hypothesis	Results
H_0	No co-integration exist between CMR of both countries	Rejected
H_0	No co-integration exist between TBR of both countries	Rejected
H_0	No co-integration exist between TBRPAK and LIBOR	Accepted
H_0	No co-integration exist between CMRPAK and LIBOR	Accepted
H_0	No co-integration exist between ER of Pakistan and LIBOR	Accepted
H_0	Co-integration exist between CMR and TBR of Pakistan	Accepted

Given that both markets are linked, any internal or external shock would affect all three markets in a direct or indirect way. This is an important finding and could be used as important policy implications. For example, policy makers, while making a decision on internal policy should be mindful of the implications of their decision. On the flip side, policy makers could take a priori measure in one of the markets (e.g. interest rate) if an external shock is forthcoming and expected to hit a market (e.g. foreign exchange).

7.1 Limitations and Recommendations

One of the limitations of this study is its small sample period consisting of nine years 2000-2008. In the future more years needs to be added to expand this sample period. The study lacks a clear link between theory and analysis therefore in the future the authors must provide a clearer link between theory and analysis. Moreover, if the objective is to show that the linkage is different after the financial liberalization in 2000, a before and after analysis should be conducted. Also in the future the study needs to show how it contributes to the literature beyond past work.

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