Financial Liberalization and its impact on Economic Growth of Pakistan

By

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Dedicated to My Loving Parents

For Always Making Me Believe That I Could Achieve Anything

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Abstract

This dissertation is an attempt to contribute theoretically and empirically in the area of research regarding financial liberalization and economic growth for Pakistan. On account of growing importance of financial liberalization in the promotion of growth in the developed and emerging economies and dearth of significant literature on this topic in the case of Pakistan, the present study examines the impact of financial liberalization on economic growth. The thesis investigates both the domestic and external components of the financial liberalization process and their impact on economic growth of Pakistan. The dissertation in particular develops an index of domestic financial liberalization using the technique of principal component analysis. The index captures the important dimension of reform process and quantifies the impact of domestic financial liberalization on growth. The external financial liberalization is examined through the *de jure* and *de facto* measures of external financial liberalization. The dissertation develops a quantitative measure of external financial openness through *de jure* approach on the basis of information under the capital account liberalization. The *de facto* measure of external financial liberalization is based on the work of Lane and Ferretti (2006) while the data for remaining years are updated utilizing their methodology. A joint impact of both the domestic and external components of financial liberalization (showing an overall impact of financial liberalization on growth) is also examined through the measure of domestic financial liberalization index and *de facto* measure of external financial liberalization.

The results of the study indicate a positive impact of composite index of domestic financial liberalization on economic growth. External financial liberalization when measured through *de jure* approach positively impacts economic growth. However, the de facto measure shows a negative association between external financial openness and economic growth. The empirical results finally report an overall positive impact of financial liberalization on economic growth examined by including both the domestic and external components of financial liberalization. The positive impact of financial liberalization on economic growth is on account of financial intermediation, financial deepening and easy access to capital brought through domestic and external liberalization. However, to get more pronounced benefits out of liberalization process, financial sector needs more strengthening both at the domestic and external fronts.

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Chapter 1

Introduction

During the past few decades the financial landscape of the world has changed on account of dramatic changes observed in the financial sectors of both developed and developing economies. The financial system of the countries has been transformed not only on account of liberalization of their domestic markets but also on account of unhindered capital flows. Financial liberalization adopted by the developed countries since the 1970s and later on emulated by developing countries in the late 1980s and 1990s is basically rooted in the original theoretical underpinnings provided by McKinnon and Shaw (1973)[1]. McKinnon and Shaw's financial liberalization thesis advocates that the financial markets should be free from interventions and controls and market forces should determine the allocation of credit. They accredited the dismal performance of growth and investment in developing countries to financial constraint like high reserve requirements, interest rate ceiling and quantitative restrictions in the credit allocation mechanism. They argue that the repressed and constrained financial markets discourage savings, retard the efficient allocation of resources, increase financial markets segmentation, increase the margin of financial intermediation, and decrease investment and hence economic growth. They thus provide a rationale for the financial sector liberalization as a mean to promote financial development and hence economic growth.

Besides the aforementioned role of a liberalized financial sector in growth enhancement, the opponents of financial liberalization widely debate its benefits. The financial liberalization opponents argue that through a better control over money supply and a lower interest rate, higher investment can be achieved. Financial development also involves risks in terms of trade deficit through domestic currency appreciation, high inflation rates and current account deficit among others. However, despite all these arguments, financial liberalization and its impact on economic growth and development is one of the most researched topic.

[1]Before McKinnon and Shaw's financial repression thesis, Goldsmith (1969) also opposed financial repression on account of its detrimental effect on the efficiency of capital.

It is pertinent to note that the financial sector development and growth preceded the financial liberalization. Starting from the works by Schumpeter (1911), Robinson (1952), Goldsmith (1969) and then by Mckinnon and Shaw (1973) and subsequent researchers, all presented considerable evidence that how financial intermediation and economic growth are interrelated and how financial development correlates with economic growth. A number of other recent studies use endogenous growth theory to explain the relationship between financial development and economic growth (King and Levine, 1993; Bencivenga and Smith, 1991; Pagano 1993). The general mechanism working here is that financial development increase the efficiency of capital, which through an increase in productivity of capital positively impact the economy's long run rate of growth.

The impact of financial development on growth has been studied extensively. The exclusive literature on the impact of financial liberalization on economic growth is relatively scarce. It has been a normal practice to use financial development and financial liberalization as the same things as the variable determining financial development are very often also used to examine financial liberalization. However, financial liberalization and financial development should not be treated as identical concepts, as the former means the dismantling of barriers both in the domestic and external sectors of financial services; the latter reflects the progress and improvement in the financial structure of an economy.

Apart from the discussion on differentiating financial development and financial liberalization, it is pertinent to mention here that besides the aforementioned benefits of domestic liberalization of the financial sector, the external liberalization of the financial sector is equally important in terms of growth benefits that it offers. As suggested by the neo-classical framework, and advocated by proponents of external financial liberalization, the openness of the external financial sector of economies will lead to an unhindered flow of capital from capital rich economies to capital scarce economies where the return on capital is usually high. This flow of capital complements the limited domestic savings in capital scarce economies. The resultant reduction in cost of capital allows for increased investment and hence economic growth. The liberalization of domestic financial sector accompanied with a successive liberalization of the external financial sector thus affects growth positively through capital accumulation and increase in investment.

The literature which so far exists in the area of financial liberalization and growth generally study the impact of financial liberalization on growth through various dimensions of reforms on domestic front while incorporating the external liberalization through capital account liberalization. Studies relating to capital account openness, capital mobility and currency substitution also exist in the literature which assesses the liberalization within external sector (Erturk (2005), Donmez (2010), Cuddington (1982).The relationship between capital account liberalization or external financial liberalization and growth in the existing literature is measured through a dummy variable or through a scale showing liberalization of a regime. (Bandiera, *et al*. (1999), Achy (2003), Bwire & Musiime (2008), Hermes and Lensik (2005), Ang and Mckibbin (2005)), for example, examine the impact of financial liberalization on various macroeconomic variables like growth, investment or saving. In contrast to this, other studies separately investigate the impact of external financial liberalization on growth. They study the international financial integration or external financial liberalization either through equity market liberalization (Bonfiglioli (2005), Bekaert *et al.* (2001)) or through a measure of de jure/de facto financial openness. (Ozdemir and Erbil (2008), Kose *et al.* (2006), Lane and Ferretti (2006), Quinn (1997), Edison, *et al.* (2002)). Although, the result coming out of these studies present a mixed evidence on the impact of financial liberalization on growth. Majority of studies find that financial liberalization does not significantly affect growth. Nevertheless, these empirical conclusions are not enough to negate the actual relationship that financial liberalization has with growth. Since not only the choice of a particular technique to examine the relationship between financial liberalization and economic growth matter a lot, but certain macroeconomic factors that are prerequisite for the successful implementation of financial liberalization are indeed vital.

With this background of financial liberalization and its relation with economic growth, the present study explores the cumulative impact of both domestic and external financial liberalization on economic growth in Pakistan. Since the late 1980s Pakistan has liberalized its financial systems. Pakistan liberalized its financial sector under the broad based macroeconomic structural adjustment program launched in the late 1980s. The primary objective of the liberalization was to create a level playing field for financial institutions and markets by instilling competition, removing the distortion and segmentation in financial markets thereby increasing the competition, efficiency and productivity of the financial sector. Various theoretical and empirical studies relating to financial sector reforms and their effect on Pakistan are available.

(Rehman, *et al.* 2011; Khalid, 2004; Hasan, *et al*. 1996; Haque, 1997; Khan and Hasan, 1998; Khan and Qayyum, 2007; Haque, 2011; and Janjua, 2011). However, majority of them are either limited to a descriptive analysis or suffers from the problem of limited data and omitted variable bias. Besides these problems, no significant work to-date exists in the literature that has comprehensively studied the joint impact of both the domestic and external components of liberalization of financial sector on growth.

The present study fills all these gaps by examining both domestic and external components of the financial liberalization process and their impact on economic growth of Pakistan. The study in particular develops an index of domestic financial liberalization using the technique of principal component analysis to capture the important dimension of reforms process and quantifies the impact of domestic financial liberalization on growth through this index. The external financial liberalization is examined through both *de jure* and *de facto* measures of external financial liberalization. A joint impact of both the domestic and external components of financial liberalization (showing an overall impact of financial liberalization on growth) is also examined through the measure of domestic financial liberalization index and *de facto* measure of external financial liberalization.

1.1: Objective of Study:

The main objective of this study is to assess the impact of liberalization of financial sector on the economic growth of Pakistan. More Specifically the study aims to achieve the following objectives; that is,

- To analyze the impact of domestic liberalization of the financial sector on economic growth of Pakistan through developing an index of domestic financial liberalization.
- Analyze the impact of external liberalization of the financial sector on economic growth of Pakistan through *de jure* and *de facto* measures of external financial openness.
- Examine the simultaneous impact of external and internal liberalization of financial sector on economic growth of Pakistan through domestic financial liberalization index and de facto measure of external financial openness.

1.2: Justification of Study:

The rationale of evaluating the liberalization of the financial sector and its impact on economic growth of Pakistan lies in the fact that the usual work on liberalization focus on the goods sector to examine the impact on economic growth. However, no serious effort has been undertaken to explore the impact of liberalization of financial sector on economic growth of Pakistan. Whatever literature on liberalization of financial sector exists, normally evaluate separately either the impact of financial liberalization (through dummy variable/scaled variable) or external financial liberalization on economic growth. So far the studies ignored the joint impact of domestic and external components of liberalization of financial sector through proper measures of domestic and external components of financial liberalization on economic growth for a developing country like Pakistan. Liberalization of the financial sector which is the backbone of every economy offers enormous benefits in terms of its positive impact on economic growth and other macroeconomic variables. Since the financial sector is critical for mobilizing saving and allocating resources to most productive uses thus one cannot lose its sight on its contributions in the development of an economy. It is also an established fact that more developed financial economies perform better, generate more output and are more developed. The finance–growth nexus has been proved as positive for Pakistan. So on account of the due importance of the financial sector in the overall development of economies, it thus become imperative to examine the implications of liberalization of this sector on economic growth employing both the domestic and external components of financial liberalization. With this rationale in mind, the present study will explore in depth the impact of financial liberalization on economic growth of Pakistan.

1.3: Organization of the Study:

The rest of this study is organized as follows. The second chapter reviews the existing theoretical and empirical literature relating to liberalization of financial services and its impact on economic growth in general context Pakistan in particular. The third chapter is on financial sector and financial sector reforms in Pakistan. The fourth chapter elaborates the methodology of the underlying empirical model and discusses in detail the theoretical underpinnings of the relationship between financial liberalization and economic growth. Empirical model, estimation

procedure, data and variable description are presented in the fifth chapter. While empirical results are discussed in chapter six. The final chapter ends up the study presenting the conclusion with some policy recommendations and limitations and future extensions of current study.

Chapter 2

Literature Review

Chapter 2 reviews the existing literature on the association between financial liberalization and economic growth. International studies on the association/relationship between financial liberalization and growth either through an overall measure of financial liberalization or only through a thorough investigation of the domestic financial liberalization are presented here. Besides this, the studies exclusively measuring external financial liberalization through either *de jure* or *de facto* approach are also the part of the same chapter. Pakistani literature regarding the relationship between financial liberalization and economic growth is also splitted into two parts. Studies relating to an evaluation of reforms, an overall impact of financial liberalization on economic growth or impact of domestic liberalization on economic growth is studies in one part. While the other one captures the studies on the impact of external financial liberalization on economic growth. The chapter finally concludes with the identification of gaps existing in the already presented literature and the intention of the current study to fulfill all these gaps**.**

2.1: International Literature on the relationship between financial liberalization and economic growth

We divide this section into studies dealing with financial liberalization or domestic financial liberalization and economic growth and studies on external financial liberalization and economic growth.

2.1.1: Impact of domestic or overall financial liberalization on economic growth

El Khoury and Savvides (2006) using a threshold regression model, which selects endogenously and test simultaneously the existence of a threshold level of per capita income, estimate the impact of services trade openness on economic growth of high and low income counties. The threshold variable being the initial per capita income, they test underlying hypothesis of an impact of trade openness on economic growth of a country depending on country's level of development. They estimate the growth equation with average annual growth rate of per capita as a dependent variable influenced by independent variables being a vector of

growth conditioning variables, openness measures of telecommunication and financial service sectors and an initial level of per capita income. The indices of openness for financial and telecom sectors are from Mattoo *et al.,* (2001). The results through ordinary least square (OLS) estimates without a threshold do not imply a significant impact of openness in telecommunication and financial services on economic growth. However, employing the threshold regression model, the results indicate a significant positive association between openness in telecommunicating service and economic growth for countries below a threshold level of income and for financial services a significant relationship between openness and growth for countries with income per capita above the threshold level.

Mattoo *et al.,(*2001) study the impact of liberalization of financial and telecommunication sectors on economic growth for a sample of 60 countries (37 of which are developing ones) using cross country regression analysis for the period 1990-1999. A set of openness indicators is created for both the sectors. The telecommunication openness index represents three policy variables namely foreign ownership, competition and regulation, and its value ranges from 1 to 9 with higher values signifying grater liberalization. The liberalization index for the financial sector is based on same policy variables as in the case of telecom with the exception of the third variable of regulation replaced by capital control and the index value in this case ranges from 1 to 8. The regression specification include growth rate of GNP as dependent variables and vector of standard growth control variable and vector of openness to trade in services as independent variables. The results from the estimation show that coefficients on both the indices are consistently positive with the financial sector index significant at 5 percent level while telecom index significant at 10 percent level. The coefficient estimate of 0.15 on dummy for complete liberalization in both sectors also suggest that countries with fully liberalized financial and telecom sectors tend to grow 1.5 percentage points faster than others in the 1990s. Besides the above mentioned contribution made by the authors in area of trade in services, considerable scope for further research by incorporating more service sectors and upgrading the quality of data and policy variables remains there.

Seyoum (2007) examines the competitiveness of business, financial, transport and travel services in developing countries compared to international markets. To measure the comparative advantage of developing countries in these four services for 1998-2003, he has used three

Revealed Comparative Advantage Indices (RCAs). Results drawn from all three indices show that strong comparative advantage exist for many developing counties in transport, travel/tourism. While about one third of countries such as Argentina, Egypt, India, or Turkey in the sample also show comparative advantage in financial services there is considerable room for improvement in business and financial services. The consistency test of indices made by using cardinal, ordinal and nominal measure of comparative advantage show significance of correlation among RCA indices and suggests that three indices employed are consistent as measures of comparative advantage. RCA explaining the level and trend of service export pattern in developing countries show that there is evidence of some weakening in the RCA in services sector, however, their RCA does not show a fundamental shift in the structure of their comparative advantage. Trade liberalization along with lack of preparation emerges out as major cause of weakening of their comparative advantage over the years. Developing countries should upgrade their infrastructure and technological capabilities to take advantage of existing opportunities in services. The above described measures offer a useful tool for the analysis of comparative advantage of developing countries. Nevertheless, the impact of government distortions (like subsidies or quotas) on RCA indices is not explained by these measures.

Achy (2003) empirically examines the impact of financial reforms on economic performance of five MENA region countries beside reviewing the literature on rationale for financial repression and an examination of theoretical and empirical literature on link between financial liberalization, saving and investment. To investigate the impact of financial liberalization on private saving, private investment and growth, four traditional indicators of financial depth are used. Besides this, financial liberalization index has been constructed following Bandiere (1999), based on information on eight main dimensions of financial reforms (interest rate regulation, reserve requirement, credit allocation, bank ownership, pro competition measures, security markets, prudential regulation and capital account liberalization). Utilizing fixed effect estimation and panel data approach, the equations are estimated. Other policy variables are also included in the regression to avoid omitting variable bias. Results in case of the effect of financial liberalization and development on all three macroeconomic variables (saving, investment and growth) show a negative impact with the exception of saving variable, these results are not consistent with the previous literature. A plausible explanation of the results lays in the fact that financial liberalization and development have provided a boost to mortgage and

consumer credit market, leading to deterioration of credit allocation for an increase in consumption rather than boosting up the productive activities in the economy. A deeper insight on this issue requires an investigation of the effect of credit distribution between micro units such as households and firm, between small and large firms and even among the sectors.

Hermes and Lensink (2005) besides investigating the impact of the financial liberalization on saving and investment also examine the impact of financial liberalization on growth for a sample of 25 developing economies over the period 1973-96. Using a new data set provided by Abiad and Mody (2005) which captures six different dimensions of financial market policies, a score running from 0 (full repression) to 3 (full liberalization) is used for measuring financial liberalization. The dataset consist of a panel of six four years periods for a total of 25 countries. Estimating a set of equations where the impact of financial liberalization is studied separately on growth, saving, total investment, private investment and public investment report interesting results. The financial liberalization measure is positively and highly significantly related to growth in all specifications. Total investment is, positively but not significantly associated with financial liberalization. However, when we breakdown total investment into private and public one, the former is positively and significantly affected by liberalization contrary to the latter one which is negatively and significantly affected by liberalization measure. As far as saving is concerned, it is not significantly affected by financial liberalization. The issues for future research from this paper highlight the need to study in more detail the association between saving and financial liberalization, besides examining the efficiency impact of financial liberalization. Furthermore, the study can be enriched by incorporating more countries like Central and Eastern European countries, which have experienced financial market modifications but for which no concrete literature is available.

Ang and Mckibbin (2005) examine the role of savings, trade openness and real interest rate to establish the relationship between finance and growth, for small open economy of Malaysia from1960 to 2001. Using principal component analysis they have constructed a single financial development index to signify the development in the financial sector of Malaysia. Utilizing this index and other control variables like saving, trade openness and real interest rate in four trivariate VAR (Vector Auto Regressive) models, they report the incidence of no short run causality in all models. However, growth applies a positive and unidirectional causal effect

on finance in the long run in the models where saving and trade openness are used as control variables. The results points to conclusion that although the financial sector of Malaysian economy has been enlarged on account of financial liberalization but it does not appear to be effective in promoting economic growth. This conclusion should not be interpreted in the sense that financial liberalization should not be undertaken but it does emphasize the role of an efficient, well functioning, well regulated, financial system to absorb the benefits of liberalization.

Banam (2010) empirically examine the impact of financial liberalization on economic growth in Iran employing Johenson cointegration technique. A financial constrained index created by Taghipour (2009) was multiply with -1 to obtain financial liberalization index for this study and was used with other conventional determinants of growth to investigate the relationship between financial liberalization, other growth control variables and economic growth. The results of the co integration test indicate that financial liberalization, capital, research and development and financial intermediation exert a positive and significant impact on economic growth in Iran. Exports also positively but insignificantly affect growth. Reserve requirement negatively impact growth but this relationship is statistically found to be insignificant. However, the labor is reported to have a negative but significant impact on growth contrary to existing theories. The findings of the study support Mckinnon and Shaw's (1973) financial liberalization thesis that financial liberalization can promote economic growth through increase in investment and productivity.

Bandiera *et al* ., (1999) study the impact of financial liberalization on saving by constructing 25 years time series indices using the method of principal component analysis for a sample of eight developing countries. Index captures the exogenous changes in important dimension of financial reforms such as interest rate regulation, directed credit, reserve requirement, bank ownership, precompetitive measures, prudential regulations, liberalization of securities market and international financial liberalization. Based on the historical evolution of a policy change along each dimension, they have created a 0-1 dummy variable with one representing the more liberalized regime. This gives a matrix of 0-1 variable for each country and principal component of the matrix has been constructed for each country. Employing the index generated on the basis of principal components along with technique of panel co-

integration, the results of the study do not support the hypothesis that financial liberalization will increase saving. Contrary to this, the evidence suggests that overall liberalization and specifically the one attached with the relaxation of liquidity constraints may in fact lead to a fall in savings.

Berthelemy and Varoudakis (1996) empirically test the existence of multiple steady state equilibrium in a cross section of countries by employing the maximum likelihood method. They have constructed a theoretical model employing real sector and financial markets, which exhibits multiple steady state equilibrium of endogenous growth. Financial sector expands on account of growth in the real sector, and in return the development of financial sector increases the net yield on savings, thereby enhancing capital accumulation and growth. Among multiple equilibrium, one is attached with poverty trap where financial sector disappears and economy languishes while another steady state is attached with positive endogenous growth and an increase in financial intermediation. The study also incorporates convergence club tests that accept several possible origins for poverty traps. The results of the study report the existence of multiple endogenous growth equilibria not only on account of insufficient development of country's financial sector but also in association with the human capital as long as return to accrual of human capital are positively related to economy's educational development. The results further show that educational development is a precondition for growth, however, even if this precondition is satisfied, an underdeveloped financial sector can still be a severe obstacle to growth. The success of the optimal policies in other areas such as trade policy and government expenditure policy also depends on the presence of a well developed financial system. The study thus suggests avoiding any kind of repression policies in financial sector in order to get benefits of optimal policies in other areas.

Pagano (1993) presents a theoretical model employing endogenous growth theory in order to elaborate the channels through financial intermediation affects economic growth. According to the model, financial intermediation affects economic growth through saving rate, fraction of saving channeled to investment or through social marginal productivity of investment. Financial development is expected to exert positive influence on growth, however, the improvement in risk sahrinh and house hold credit market on account of financial development may reduce the saving rate and consequently economic growth. So the author finds the financial development to be too general a term used to gauge its impact on growth. Rather he suggests that

one must specify the particular financial market concerned to see its impact on growth. The author also suggests to explore how the development of different markets affect growth since empirical evidence do provide the presence of predicted correlations among financial development and growth in cross country studies.

Abiad *et al.,* (2008) construct a latest financial reforms database, for 91 countries from 1973-2005. Considering the multifaceted nature of financial reforms, they have recorded the financial policy changes along seven important dimensions which include credit control and reserve requirement, interest rate controls, entry barriers, state ownership, securities markets, banking regulations and restrictions on capital account. Different questions have been asked under each dimension and scores have been assigned to each category. Final score for each country is given on a scale from zero to three, where zero represents highest degree of repression in contrast to three which indicates full liberalization. These final scores are then utilized to calculate an aggregate index for each country/year by assigning equal weights to each dimension. This data base, in contrast, to other data bases which use binary dummy variables to code financial liberalization, codes financial liberalization measures according to their magnitude and timing. According to the final aggregate index calculated for each country, most of the countries have undertaken substantial reforms during the past 30 years. The East Asian countries have moved gradually toward financial liberalization than Latin American countries. South Asian countries have proceeded at a steady pace after the introduction of reforms in those countries after mid 1980s. The transition economies have experienced the fastest episodes of financial liberalization. The graded measure constructed by incorporating the important dimensions of financial reforms can be used as an important tool to empirically investigate the impact of reforms on financial sector variables and real sector variables.

Ince (2011) examines the finance growth linkage in case of Turkey from 1980-2010 employing VAR analysis and Co-integration tests. Economic growth is represented by growth rate of GDP which is dependent variable while variables used to capture the indicator of financial development are: broad money as a ratio to GDP, domestic credit as a ratio to GDP, private credit as a ratio to GDP, total deposits as a ratio to GDP, commercial bank assets to central bank assets, and stock market capitalization. The findings of the study strongly support the existence of a one way causal relation ship between financial development and economic

growth only in the short run. The failure of the long run causality between financial development and economic growth is attributed to high inflation, uncertainty and instability in economic policies. The author recommends the revaluation of role of commercial and private banks in the country as they are the most important intermediaries between savers and investors.

Sulaiman, *et al.,* (2012) empirically examine the effect of financial liberalization on economic growth in Nigeria employing Johenson Cointegration test and Error Correction Mechanism (ECM). They analyzed the time series data from 1987-2009. The variables used to determine the effect of financial liberalization on economic growth include GDP as dependent variable and lending rate, exchange rate, inflation rate, financial deepening (M2/GDP) and degree of openness as independent variables. The result of the co- integration test reveals the existence of a long run relationship among the variables and the error correction mechanism also verifies a significant speed of adjustment in both the over parameterized and the parsimonious models. The long run relationships attained under co-integration test shows a positive association between GDP and all other explanatory variables except financial deepening. The findings of the study ascertain a positive effect of financial liberalization on economic growth in Nigeria thus concluding that deregulated lending rates have provided a boost to efficient intermediation of funds, thus contributing to economic growth.

Enowbi and Mlambo (2012) empirically examine the relationship between financial instability, financial liberalization, financial development and economic growth using dynamic panel approach for a data set of 41 African countries from 1985-2010. To construct financial instability index, the study follows the method proposed by Jeroen Klomp and Jakob de Haan, (2009) applying principal component analysis on a number of financial stability indicators. Financial liberalization is measured through index of capital account openness developed by Chinn and Ito (2007), while financial development index is constructed employing principal component analysis for main financial development indicators. The study also incorporates other control variables such as government expenditure, changes in terms of trade and inflation. The result of GMM panel estimation shows that economic growth is negatively affected by financial instability in case of Africa. Financial development and financial liberalization usually escort to financial instability, and in the post liberalization period the effect of financial instability on financial development and economic growth seems to be less obvious.

An empirical analysis of the relationship between financial liberalization, foreign direct investment (FDI) and economic growth is carried out by Bilel and Mouldi (2011) for 6 MENA countries using panel data approach for the period from 1986-2010. To measure financial liberalization, they used a dummy variable taking value 0 before liberalization and 1 after liberalization. Besides the variable of financial liberalization and FDI which are of major concern in the analysis, the other explanatory variables regressed on growth of real GDP per capita include market capitalization, turnover, openness, inflation and domestic credit to private sector. The results of the empirical estimation illustrate a negative relationship between financial liberalization and economic growth while a positive one for FDI and economic growth. Among other explanatory variables; market capitalization, inflation and credit to private sector have positive and significant impact on economic growth, while turnover and openness variables do not significantly affect economic growth. The study however, does not mention any concrete justification for the existence of such a negative relationship between financial liberalization and economic growth.

2.1.2: Impact of External financial liberalization on economic growth

Bonfiglioli (2005) empirically examines the impact of international financial liberalization and banking crisis on capital accumulation and productivity for a sample of 93 countries covering the period between 1975 and 1999. While assessing the impact of financial liberalization (employing a dummy variable both for capital account openness and equity market liberalization), and banking crisis (using a zero-one anecdotal indicator) on capital accumulation and productivity, he has controlled a number of other variables. Utilizing different econometric techniques like logit and multinomial logit and system GMM, the findings of the study are found to be fairly robust contrary to existing literature. In the case of financial liberalization, it does not significantly affect capital accumulation but it has a strong positive effect on productivity. Routed through financial development financial liberalization positively affects productivity growth while it directly impact the level of productivity. Banking crisis, however, is found to be harmful both for investment and productivity as it depresses both capital accumulation and productivity. Nevertheless, no evidence emerges out of this study which shows the financial liberalization to increase the chances of a crisis, with the exception of borderline crisis in developing countries. On the basis of these findings the study thus concludes that it is needless to

say that an economy is exposed to higher financial risks on account of removal of barriers to capital mobility.

Bekaert *et al*., (2001) examines the impact of financial liberalization particularly equity market liberalization on economic growth employing four different data samples applying the panel estimation techniques. They found that financial liberalization increase the per capita GDP by 1 percent over a five year period. This result remains valid even if an alternative set of liberalization dates, different grouping of countries, different weighing matrices for calculation of standard errors etc, is used. The channels through which liberalization impact economic growth show that the impact of liberalization is not spuriously accounted for by macro economic reforms. Similarly, the existence of financial development variable does not knock out the liberalization effect. However, both the investment and the efficiency of investment increases substantially after liberalization but the authors has not been successful in attributing the increased growth to relaxation of financing constraints. Beside the channels affecting growth, country specific conditions like small government sector, larger secondary school enrollment and an Anglo-Saxon Legal system enhances the liberalization effect.

Athukorala (2000) examines the role of capital controls as crisis management tool in Malaysia during the Asian financial crisis. Malaysian openness regime was sequential in the sense that capital account liberalization was preceded by current account openness; however, significant liberalization of capital account accompanied by aggressive portfolio inflows exposed the Malaysian economy to financial crisis on account of increasing macroeconomic imbalances and loosening financial prudence. Specifically speaking, fragile financial sector and poor corporate governance were the two fundamental sources of vulnerability in case of Malaysia. With an opening of domestic capital market to equity investors but in poor corporate governance, substantial lending by the banks fueled by the public investment boom along with the equity market bubble finally resulted in an economic collapse. Contrary to many other developing countries (who move to IMF for crisis management), Malaysian authorities in fact developed their own rescue program to come out of this financial crisis. Imposition of capital controls and fixed exchange rate system provided the setting from recovery from the crisis. The government then moved to revive the economy by providing macroeconomic stimulants and banking and corporate restructuring. These new policy measures in fact helped the Malaysian economy to

come out of crisis and achieve recovery. However, we cannot draw a general inference from the Malaysian case that capital controls are conducive for crisis management on account of the fact that policy measures successful for one country cannot be generalized to other countries.

Edison *et al*., (2002) examine the impact of international financial integration on economic growth for a sample of 57 countries employing extensive measures of international financial integration and a range of statistical methodologies. They also assess whether the association between economic growth and international financial integration is dependent on factors like level of economic development, legal system development, financial development, government corruption, and macroeconomic policies. An extensive range of international financial integration measures such as IMF's restriction measures, Quinn (1997) measure of capital account restriction, total stock of capital flows, stock of inflows, capital flows, and capital inflows have been examined through OLS, 2SLS and GMM. Contrary to both OLS and 2SLS, only in the panel estimates the measure of financial integration (stock of capital inflows and outflows as a ratio to GDP) is significantly associated with growth. In case of OLS, the other two measures of integration (flow of capital and inflow of capital) positively impact growth. 2SLS identifies not even a single measure positively affecting the growth. The general picture coming out of whole analysis is that international financial integration per se does not increase economic growth even when we control some economic, financial and institutional variables. However, this does not imply that financial integration is uncorrelated with economic growth. In fact, international financial integration (IFI) is positively associated with different economic, financial, institutional and policy variables implying that successful countries are generally open economies. The results of the study, however, should be interpreted cautiously given the limitation that countries impose different types of barriers to different types of financial transactions and the effectiveness of these barriers vary across countries, time and type of financial transaction.

Vlachos and Waldenstrom (2002) investigate the growth effects of international financial liberalization and integration at the industry level using the methodology and data developed by Rajan and Zingles (1998). They study the growth effects using real value added growth rate, real production growth rate and number of establishments while employing different measures of equity market liberalization, capital account liberalization, and capital market integration. The

OLS and instrumental variable estimate suggest that a high dependency on external finance do not guarantee a higher growth in value added among countries with more liberalized capital account or equity markets. However, liberalization of capital account and equity markets positively impact the countries with well developed financial systems through creation of new firms and growth in production. The positive influence of liberalization on growth is on account of increased competition and industrial vertical disintegration and corporate outsourcing.

Singh (2003) reviews the theoretical and empirical literature regarding capital account liberalization, free long term capital flows, financial crisis and economic development. Discussing the theoretical dimension of free capital mobility, the neo classical framework suggests that free flow of capital from capital abundant to capital scarce countries will complement their savings and through a reduction in the cost of capital will lead to more investment and growth. The empirical literature on the impact of economic growth is, however, mixed. The economic and financial crisis of Asia, Latin America and Russia have shown that short term capital flows are volatile and subject to sudden withdrawals, and they could have severe adverse consequences for developing countries. Contrary to this, the long term capital flows (especially FDI) are thought to be more stable and growth promoting. However, even FDI, if unregulated can be costly for developing countries. The developing counties should be cautious in opening up their capital accounts in the light of documented literature, and should resist any new order of new multilateral agreements on investment in WTO if it is harmful to them.

Eichengreen *et al*., (2009) synthesize the previous literature on the impact of capital account liberalization on industry growth while controlling for factors such as domestic financial development, financial crisis, and institutional strength. They found a significant positive impact of capital account liberalization on growth of financially dependent industries. However, this positive impact is eliminated in times of crisis. They have further revealed that the countries with well developed financial systems, good accounting standards, strong credit rights and rule of law enjoy the benefits of capital account openness. These results thus propose that countries must reach certain threshold in terms of economic and institutional development if they want to reap the benefits coming from the opening of capital accounts.

Klein and Olivei (2001) demonstrate a positive and significant impact of open capital account on financial depth and economic growth in a cross section of countries including both the developed and developing one over a time period of 1986-1995 and 1976 -1995. Using both the OLS and Instrumental variable technique, they come up with the same conclusion that countries with open capital accounts over some part or all of these periods enjoy greater increase in financial depth than the countries with continuing capital account restrictions. Moreover, they also enjoyed greater economic growth. However, this conclusion is limited only to developed countries included in the sample. The policy implication regarding the desirability of opening capital account in developing countries thus require adequate institutions and sound macro economic policies to maximize the benefits coming from opening of capital accounts.

Developing a theoretical model showing the link between liberalization of capital account, quality of institutions and economic growth, Klein (2005) empirically estimates the relationship for a panel of 71 countries. Estimates of all three specifications (i.e., OLS, instrumental variable (IV) and the non linear least square estimates) demonstrate an inverted U shape relationship between the responsiveness of growth to capital account liberalization and economic growth. The findings show that capital account openness impact positively the economic growth in about one quarter of the countries with better (but not the best) institutional quality. The countries that tend to benefit significantly from capital account openness are mostly the upper –middle-income countries. The results thus suggest that it is not capital account liberalization per se which contributes positively towards economic growth but the environment in which that openness is allowed is indeed very important.

Kim *et al*., (2012) examine the impact of financial openness on economic growth and macroeconomic uncertainty for a group of 70 economies from 1960-2007. Using stock of foreign assets and liabilities as a ratio to GDP as a measure of financial openness and testing the relationships by employing the PMG (pooled mean group) approach of Pesaran, Shin and Smith (1999), they find the co-existence of short run adverse and long run beneficial effects of financial openness on economic growth. The long run coefficient of openness measure on economic growth is 1.12 and 3.59 for 1960-2007 and 1987-2007 period implying a positive, significant impact of openness on economic growth. However, short run coefficients are highly significant and negative with a magnitude of -2.64 and -3.61 for 1960-2007 and 1987-2007 periods

respectively. Beside these results, financial openness also negatively impact macroeconomic uncertainty in the long run while its impact is found to be positive in the short run. These results shows that there is a trade off between the long run gains from financial openness against the short run pains as financial openness increase the chance of financial crisis and fragility but strengthens financial deepening and institutional development that affect long run economic growth and macro economic uncertainty.

Eichengreen and Leblang (2003) study the relationship between capital account liberalization and growth for a panel of 21 countries from 1880-1997 and a wider panel for the post 1971 period. They argue that the reason for the inconclusive results obtained through previous studies is their failure to account for the impact of crisis on growth and for the capacity of controls to limit those disturbing output effects. They account for these effects through inclusion of capital controls and crisis in their dynamic panel estimation. For the entire period of 1880-1997, capital control comes out to be positively and significantly associated with growth. Growth was even faster in the interwar years for the countries that were imposing controls suggesting that the interwar capital flows were destabilizing and the countries which protect themselves from such flows experienced superior growth performance. Both domestic and international crisis in the presence of an open capital market negatively impact the growth. However, controls neutralize the impact of crisis on growth and controls otherwise have no additional effects. The results of the study further suggest that when both the domestic and international financial systems are well functioning, controls negatively impact the growth. The study thus concludes that the benefits of an open capital account dominate its cost in the presence of a robust well function domestic and international financial system. Controls hurt the growth on account of forgone efficient allocation of resources offered by an open capital account. However, in the periods of financial instability controls best serve the economies by insulating them from the negative impacts of crisis.

Block and Forbes (2004) review six most important arguments against capital account liberalization for emerging markets and they argue that these six arguments are largely myths instead of realities. These six arguments are: an inconclusive empirical evidence on the benefit of capital account liberalization, example of Chilean capital controls as a success story and should be employed by other emerging markets, flow of capital from poor to rich countries, lifting

capital controls increase a country's vulnerability to financial crisis, a reduction in the capacity of IMF to response to crisis because of capital account liberalization and certain prerequisites necessary to undertake before lifting capital controls. The study argues that only two of the above mentioned arguments regarding the presence of necessary prerequisites like financial, institutional and macroeconomic capabilities and flow of capital from poor to rich countries are partially a myth and partially a reality. However, other four arguments are totally a myth on account of the fact that counter evidence in case of all other four arguments exists. Nevertheless, these arguments should not be taken as a justification by emerging markets to delay capital account liberalization. Instead emerging market s should focus on the realities of huge benefits offered from the free movement of capital, along with important concerns regarding the building of strong institutions and financial systems while uplifting their capital controls.

Lane and Ferretti (2006) construct a data set on external assets and liabilities for a sample of 145 countries covering the period from 1970-2004. The data set provides the position on external assets and liabilities distinguishing between foreign direct investment, portfolio equity investment, official reserves and external debt. The data set has been constructed utilizing the information for recent years under the international investment position published by IFS and moving backward with data on capital flows and making valuation adjust for capital gains and losses in order to generate estimate for stock position for earlier years. The data set thus constructed shows that both industrial and developing countries have experienced an increased level of financial integration through 1990s. A shift in international balance sheet of the countries is accompanied with more reliance on debt liabilities for external finance by major debtors. However, the emerging economies equity component in their external liabilities has shown an increasing trend and they have also accumulated significant official reserve assets. Developing countries stay behind the developed ones in terms of gross financial integration, as scale of cross border asset trade is smaller in developing countries compared to developed ones.

Kose *et al.,* (2006) synthesize the literature on the impact of financial globalization on growth along with the evaluation of financial integration of 145 countries based on data set of Lane and Ferretti (2006). The study finds that different impacts (positive, negative or inconclusive) of financial globalization on growth are because of the adoption of different techniques for the measurement of financial integration. Studies that use measures of de facto

integration or more fine versions of de jure integration find more positive results. Similarly studies that use micro level data are also in a better position to quantify the impact of financial integration on growth and productivity. The composition of inflows significantly affects the benefits of increased financial globalization on the growth prospects for developing economies as the studies using the macroeconomic and microeconomic data reveals a positive impact of equity market liberalization on growth. The studies using micro level data also shows a positive impact of foreign direct investment (FDI) flows on productivity growth and output. Various thresholds like level of domestic financial market development, institutional quality and corporate governance, nature of macro economic policies and extent of openness to trade play an important role for a successful impact of financial globalization. The financial globalization also offers collateral benefits in terms of financial market development, better institutions and governance and macroeconomic discipline. The study offers some issues for further research as to expand the existing research plans to measure financial openness, explore the impacts of various forms of flows on productivity growth and additional research on industry and firm level data to get more information on the channels through which financial globalization impact operates.

Rodrik (1998) studies the relationship between capital account liberalization and economic growth through share measure of capital account liberalization among a sample of 100 developed and developing countries from1975 to 1989. The share measure is the proportion of years during which the capital account was free of restrictions. In relation to per capita GDP growth rate as dependent variable, he has also used investment as ratio to GDP and inflation as indicators of economic performance. Controlling for other conventional variables used as growth control variables, the results of the study do not suggest positive relationship between capital account liberalization and growth or any other indicator of economic performance.

Quinn (1997) examines the relationship between capital account liberalization and growth for a sample of 65 OECD and non-OECD countries from 1958-89. He uses the information in the AREAER to create a measure of intensity of capital account openness named CAPITAL which ranges from 0-4. He regresses the average annual growth rate of GDP on the variable “change in CAPITAL” to study the impact of capital account liberalization on growth and finds a positive and significant correlation among the two variables.

Edward (2000) investigates the impact of capital account liberalization on growth for a sample of twenty industrial and emerging economies during the 1980s. He uses Quinn's CAPITAL measure and a variable "SHARE" to measure capital account openness. The results of the study suggest that countries with more open capital accounts outperform in contrast to counties with restricted capital mobility. However, the evidence also points to the fact that the positive impact of an open capital account can be seen given a country has achieved a certain degree of economic development.

Arteta *et al.,* (2001) find a positive growth effect of capital account liberalization only in counties with strong institutions as measured by standard rule of law. However, the evidence that benefit of capita account liberalization grow with an improvement in a country's financial deepening and development are rather fragile. For the measurement of capital account liberalization they have used two capital account interaction terms. They have multiplied the Quinn openness measure by the Sachs-Warner (1995) openness measure and the black market premium. The results of the study thus sugg to remove any major macroeconomic imbalances before undertaking capital account liberalization.

Ozdemir and Erbil (2008) examine the impact of financial liberalization on economic growth of 10 new EU member countries and Turkey over a period of 12 years (1995-2007). Measuring financial openness through *de Jure* measure of financial openness along with other growth control variables in case of Turkey shows the growth to be negatively affected by financial openness. However, through *de facto* measure financial openness positively influence the economic growth in Turkey. Growth regression with *de facto* financial openness measure for panel data of 10 post 1990 EU members also report a negative impact of financial openness on economic growth of these countries. However, to explore the channels of the negative impact of openness on growth, the results of the study needs to be further investigated. Besides this, the study calls for a caution while advocating financial openness because the economies which are in transition and are going through structural change can be adversely affected by rapid openness.

The impact of financial liberalization on economic growth and its important sources, capital accumulation and TFP growth are empirically analyzed by Gehringer (2012) in the European context using difference GMM model over a period of 1990-2007. Utilizing the de jure

and de facto measures of financial openness, they assess the impact on growth and its two sources through the institutional framework in the form of European Union (EU) and euro adoption. The findings of empirical estimation show that the impact of financial liberalization on all dependent variables is found to be positive and significant in case of de jure measure. However, marginal positive impact can be seen for de facto indicator. The results also points to an important fact that the impact of financial liberalization on growth operating through institutional anchor offered by EU contributes positively and significantly to growth effects while it is missing in case of euro adoption. Within the groups categorized in the study, the Eastern European countries experience the most pronounced positive effect. The impact of financial liberalization on growth analyzed in this study covers pre financial crisis era, the author himself question the viability of these results in the presence of financial crisis and opens up new avenues for further research in this regard.

2.2: Relationship between financial liberalization and economic growth: Evidence from Pakistan

We also divide the Pakistani literature regarding the impact of financial liberalization on economic growth into two sub sections, one on the impact of domestic or overall financial liberalization on economic growth and other one on the impact of external financial liberalization on economic growth.

2.2.1: Impact of domestic or overall financial liberalization on economic growth

The degree of competition in the banking sector of Pakistan is examined by Khan (2009). He employs a widely used structural technique developed by Panzar and Rosse (PR) (1987) in the context of market contestability. Other traditional measures of competition such as M–concentration ratios, Herfindahl-Hirschman Index (HHI) have also been examined in the same study and these measures of concentration have recorded visible improvement over the last decade. However, a detailed investigation of competition in the banking sector of Pakistan using panel data of 26 banks for a period of 10 years (1997 to 2007) provides a more deep insight evaluation of the market structure /degree of competition. Khan (2009) follows Bikker *et al. (*2007) to specify the reduced form revenue equation to check contestability using total revenue as dependent variable influenced by independent variables being average price of funding,

average price of labor, average price of capital and a number of bank specific factors as control variables. Assorted statistical tests like two-sided perfect competition test, and two-side monopolistic competition test and one-sided monopoly test on PR-H statistics show that the banking structure of Pakistan is best described as monopolistically competitive. The findings of the study gets more credibility on account of the failure to reject the null of no relationship between return on assets and factor input prices signifying the presence of the long run equilibrium in the market (a key assumption of PR-H-statistic).

Chaudhary *et al.,* (2012) quantifies the effect of the liberalization of financial sector on investment and growth in case of Pakistan, employing both the bivariate and multivariate models over the time period 1972-2006. Economic growth and investment as dependent variables show that the macro economic performance is affected by financial liberalization indicators and a set of controlled variables. The results obtained by using both the bivariate and multivariate models illustrate the correct sign for all variables and broad money and private sector credit impact economic growth with short run and long run relationship (in case of bivariate model) and broad money, private sector credit, stock market capitalization and trade openness also significantly affect economic growth and investment (in case of multivariate model).

Khan and Qayyum (2007) examine the impact of financial and trade liberalization on economic growth in case of Pakistan using annual observation from 1961-2005. They have utilized Autoregressive Distributed Lag (ARDL) approach to study the long run relationship between real GDP, trade liberalization, financial development and real deposit rates. Financial development index is constructed using four different types of financial development indicators which include ratio of total bank deposit liabilities to GDP, ratio of clearing house amount to GDP, ratio of private credit to GDP, and ratio of stock market capitalization to GDP. The empirical results confirm a positive impact of both trade and financial liberalization on economic growth in Pakistan in the long run. The impact of trade openness on economic growth is found to be positive both in the short run as well as in the long run; however, financial development is negatively associated with economic growth in the short run. The relation between real interest rate and growth indicating a low effectiveness of the real interest rate signifies the importance of other variables along with the interest rate in determination of growth. Policy implications

coming out of this study advocate more focus on long run policies to create modern financial institutions, stock market development along with further trade liberalization.

Awan *et al.,* (2010) examine the impact of real rate of interest on deposits, financial liberalization and other variables (economic growth, terms of trade and real remittances) on domestic saving in Pakistan. Appling ARDL Bounds Testing Approach for co-integration on the annual time series data for 1973-2007, they have found that real interest rate, financial liberalization and economic growth positively affect domestic savings in Pakistan in the long run. The real interest rate coefficient shows a positive sign with highly significant value of 2.02 which means that a 1 percent increase in real rate of interest rate leads to2.02 percent increase in domestic saving. The liberalization dummy also illustrates a positive and significant value, suggesting a need for increased liberalization and deregulation of interest rate for mobilization of savings. While the real remittances and terms of trade show a negative association with domestic savings. The results of this study strongly favor the Mckinnon-Shaw (1973) hypothesis. The short run impacts have been examined by applying the Error Correction Model, which shows that real interest rate on deposits, change in total remittances and lags of liberalization dummy variable have negative impact on domestic saving in the short run. Contrary to this, the coefficient of change in GDP and terms of trade positively affect domestic saving in the short run.

Khalid (2004) examines the impact of financial liberalization on various key sectors in Pakistan economy utilizing the annual time series data from 1961-2002. He has constructed econometric models for determination of saving, investment and economic growth. The estimates for saving equation show the saving to be influenced by the real GDP and its own lag during the pre liberalization period. However, for 1981-2002 periods, real interest rate positively affects total savings. The investment demand function suggests that investment in Pakistan is positively determined by lagged real income and domestic credit while negatively affected by financial saving. The estimates for economic growth equation show that growth is negatively related to government saving while foreign saving positively influence economic growth. Capital flight is also negatively related to economic growth. The current study is only a descriptive analysis of an examination of financial liberalization on some macro economic variables. The study faces severe limitations in terms of post liberalization time period as the time span after

liberalization used in this study is only till 2002. Besides this, no diagnostic tests such as stationarity or co integration or any other standard estimation procedure is used to analyze the relationships under study. However, the study can be improved by addressing the mentioned limitations.

Hasan *et al.,* (1996) study the impact of financial sector reform on growth investment in Pakistan by developing and estimating a financial sector macro econometric model. The model has been divided into monetary, saving, government revenue, macroeconomic and definitional blocks. Beside the existence of long run relationship tested on the basis of the co-integration test, the regression results also show a high adjusted R-square along with correctly signed, significant t-values. An important exercise undertaken in this paper is the policy simulation exercise which investigates as to what would have happened in Pakistan if we would have introduced the reforms earlier in the eighties rather than in the nineties. Three important areas within the context of policy simulation exercise are concerned in the study. They include interest rate liberalization, spread reducing reforms and financial deepening. The findings relating to these three financial sector reform policies suggest that they have not only reduced financial disintermediation but their positive influence also pervade into the real sector. The study concludes that if the reforms have been introduced in the 1980s rather than in the 1990s, the economy could have enhanced its real GDP by over Rs. 16.5 billion every year.

Khan and Hasan (1998) empirically examine the McKinnon complementarity hypothesis for Pakistan. They have used the annual time series data from 1959-60 to 1994-95.The McKinnon hypothesis which suggests a basic complementarity between the accumulation of money balances(financial assets) and physical capital accumulation found strong support in case of Pakistan. The coefficient of saving ratio in the money demand function and of real money balances in the saving function are both positive and statistically significant in the co integration regression as well as in the error correction models. This gives ample support to financial liberalization policies pursued in Pakistan as the increase in real interest rate increases the availability of funds for investment through accumulation of money balances. Beside these findings, the income elasticity of money demand is found to be close to unity, while saving mobilization in Pakistan is independent of movement in income variables. However, the result

regarding the complementary nature of the domestic and foreign savings is in contrast to common findings.

Haque (1997) critically evaluates the financial market reforms in Pakistan. He argues that the guidelines in the financial sector should enhance the diverse functions of financial markets in Pakistan rather than stalling them. The financial system in Pakistan is underdeveloped on account of host of factors such as domination of inefficiently run government owned financial institutions, underdeveloped money and capital markets and burdensome legal processes for contract enforcement, etc. The financial sector is thus unable to perform important financial functions like risk sharing arrangement, hedging and portfolio diversification, market solution to asymmetries in information etc. In the presence of these deficiencies in the financial system, the design of the reforms should be very mindful of the function that the financial system requires. Government's role as regulator rather than the provider of financial services is important for the development of market. In addition to this, the instrument development is complementary with market development. Independent professional agencies should be given the role of regulation and supervision to ensure the stability of financial system.

Mohammad (2010) studies the relationship between financial development, openness, real interest rate and economic growth for Pakistan covering the period from 1975-2009 utilizing bound testing approach of co integration. Constructing the financial development index and using it along with a variable of openness and real interest rate in a growth regression shows that both trade liberalization and financial development play an important role in economic growth in Pakistan. Utilizing Auto Regressive Distributive Lag (ARDL) for testing long run and short run relation between the variables show that all the three variables positively impact growth rate in the long run and even the coefficient for financial development is grater in magnitude than openness in long run. However, the short run response of both the financial development and openness variables on growth is negative. The feedback coefficient of -0.1263 suggests that previous period disequilibria is adjusted back to long run equilibrium in the current year with an adjustment speed of 12 percent. Policy implications coming out of the current study emphasize on creation of modern financial institutions and further development of stock market along with more trade liberalization to boost economic growth.

Rehman *et al.,* (2011) study the effect of financial reforms on growth in Pakistan using the standard technique of OLS and employing the data from 1973-2008. To study the impact of reforms on growth, they have used the variables like deposits, lending, real interest rates, saving and inflation. The results of the study show that financial reforms positively impact the economic growth. Deposits, lending and saving rates are positively correlated with growth while inflation and real interest rate are negatively associated with economic growth. The study concludes a positive impact of reforms on economic growth, however, the results of the study needs to be cautiously taken. This is because the study suffers from severe limitations on account of the fact that no variable to capture the reforms has been included in the analysis. Beside this, the channels through which reforms impact economic growth are not properly reported in the study.

Hanif (2002) studies the financial sector restructuring in Pakistan by evaluating the reforms introduced since the late 1980s under the structural adjustment program of IMF and the World Bank. The reforms were introduced in the financial sector to get rid of repressive policies of the 1970s and the 1980s and make financial system competitive and efficient to play its role in the economic growth and development of the country. Reforms were made in some important dimension such as interest rate liberalization, abolition of subsidized and directed credit, prudential regulations, strengthening the autonomy of the State Bank of Pakistan (SBP), capital market development and external sector reforms. The author, however, concludes that reforms have not been entirely successful in achieving their set objectives. Some improvement in money and foreign exchange markets has been witnessed along with an intensification of competition among the financial institutions. However, reforms have not been successful in increasing financial deepening, reducing intermediation cost and recovery of nonperforming loans. Besides this, the pre conditions of a stable macroeconomic environment and proper sequencing of reforms lacked in case of Pakistan.

Waheed (2009) thoroughly assesses the financial sector reform process and its impact on the Pakistan economy. The study reports that financial reforms have transformed the financial structure of the country and have minimized the distortions caused by the repressive policies of the 1970s and 1980s which in turn have positive impact on monetary and real variables of the economy. Private sector credit to GDP, stock market capitalization, quantum of non performing loans, M2 to GDP and many other variables have moved to an upward trend on account of

liberalization measures. However, interest rate spread has further increased in spite of decreasing. Within the regional context, Pakistan's financial sector is still small despite several improvements. The country is lacking in financial deepening and credit to private sector. Despite a significant impact of reforms on key real and financial sector variables, the financial sector of the country still needs further broadening and deepening to achieve, higher and sustainable economic growth.

Wizarat and Hye (2010) study the relationship between financial liberalization index and industrial sector growth in Pakistan employing ARDL bound testing approach covering the period from1971-2007. To assess the impact of financial reforms on industrial growth, financial liberalization index constructed by Hye and Wizarat (2010), along with other variables such as real interest rate, labor force and capital are used. The results of the empirical estimation indicate that industrial growth is negatively affected by financial liberalization as well as real interest rate in the long run. However, both financial liberalization and real interest rate positively affect the industrial growth in the short run. The impact of labor and capital on economic growth is found to be positive in the long run as postulated by growth theory. The study recommends the policy makers to revise financial liberalization in order to address it negative impact on industrial sector growth.

Rehman (2011) investigates the impact of financial reforms on economic growth in Pakistan through the relationship among variables such as economic growth, lending rate, deposit rate interest rate, inflation and saving. He uses the method of Ordinary least square (OLS) on time series data from 1973-2008. The findings of the study show that lending rate, deposit rate and savings are positively associated with economic growth. Inflation and interest rate, however, show a negative correlation with economic growth. The result of the study thus point out to a positive impact of financial reforms on economic growth.

2.2.2: Impact of external financial liberalization on economic growth

Shahbaz *et al.,(*2008) explore the relationship between capital account n and economic growth using advanced Autoregressive Distributive Lag (ARDL) approach for the time period between 1971-2006. The other control variables used in the study include stock market

capitalization as a measure of financial development, secondary school enrolment rate for human capital, inflation, and investment as ratio to GDP. Capital account openness positively impact economic growth in the long run along with other control variables with the exception of inflation, which hurts economic growth in the long run. The study thus concludes to pursue further capital account liberalization in Pakistan but with sound macroeconomic and a prudent financial environment of the country to minimize the risks of capital account openness. The surprising aspect of the study is that it does not mention anywhere that which measure of capital account to openness is utilized to study the impact of capital account openness on growth.

Janjua (2011) gives an overview of the liberalization of capital account, experience of selected countries in this regard, along with policy changes in Pakistan related to capital account convertibility. He argues that in capital account liberalization, the sequencing of reforms is very important besides the presence of some important pre conditions like an appropriate exchange rate, an adequate stock of international reserves, and sound macroeconomic policies. The experience of selected countries shows that capital account convertibility had positive impact in terms of flow of capital, improvement in balance of payment position f those countries and reforms of market standard. However, the countries which experience financial crises with open capital accounts were mainly the ones in which their weak macro economic environment along with fragile institutional setting was responsible for crisis. In Pakistan, the gradual move from a closed capital account to open one has been followed since the 1990s and Pakistan's capital account is liberalized in terms of foreign direct investment (FDI) inflow and outflow, portfolio inflow, and a flexible exchange rate regime. The liberalization of capital account has made it easy for foreign investor to bring in and take out their capital, remit profits, dividends and fees without any restriction. Since the measures so far introduced in capital account openness label this as partial convertibility. The author concludes that some key issues like the benefits and costs of full capital account liberalization, establishment of pre-conditions and sequencing and speed of liberalization measures need to be examined before undertaking further liberalization measures or to move to a fully convertible capital account.

Haque (2011) examines the liberalization of capital account and rupee convertibility in Pakistan and identifies serious challenges which policy makers in Pakistan today face on account of capital account liberalization. Pakistani economy today is by and large free of restrictions in

terms of capital account convertibility. The only prominent restriction is on the amount of domestic currency that a traveler may physically carry overseas and on the amount Pakistani residents may hold in overseas bank accounts. The actual integration of Pakistani economy into the global economy in comparison to other emerging markets is still limited. The country's access to private foreign capital has improved on account of capital account liberalization; however, the convertibility has also made the country more vulnerable to outside shocks. In the current scenario, the policy makers face serious challenges in terms of macro economic management, specifically the exchange rate management, controlling tax evasion and minimizing the real cost of portfolio investment. The author thus concludes that capital account liberalization is here to stay and the country needs to accommodate according to changing scenarios, free markets needs to be regulated along with regulation of financial sector and supervision of stock market activities.

The theoretical and empirical literature cited in this chapter analyzes the liberalization of the financial sector and its impact on growth, investment and other macro economic variables. Since the financial sector is the core of the total services sector, some of the studies relating to the deregulation or liberalization in the context of service liberalization (which covers financial and telecom liberalization) are also included. Besides a thorough review of the international literature, the present chapter also evaluates the Pakistani studies in the context of financial liberalization and growth. While most of the Pakistani literature present a positive impact of financial liberalization or domestic financial liberalization on growth. The international studies present mixed evidence on the impact of the financial liberalization on growth; some studies concluded that financial liberalization affect the growth positively while others found a negative impact. In case of external financial liberalization, Pakistani literature is very scarce and even the studies that examine the impact of external financial linearization does not accurately measure the true integration of our economy with the international financial markets. The literature on international studies thus points us to conclude that these empirical studies do not provide unambiguous answer to the actual relationship between financial liberalization and growth. Since not only the choice of a particular technique to examine the relationship between financial liberalization and economic growth matters, but certain macroeconomic factors that are prerequisite for the successful implementation of financial liberalization are indeed vital. Besides this, majority of the studies investigate the impact of financial liberalization on growth through

different dimensions of reforms on domestic front while incorporating the external liberalization only through capital account liberalization. The capital account liberalization is measured in these studies through a dummy variable or through a scale showing liberalization of a regime. Furthermore, lots of the studies separately investigate the impact of external financial liberalization on growth either through de jure measure or de facto measure. Even a single study is not found in case of international literature which thoroughly examines the impact of domestic liberalization and external liberalization (through a true measure of openness/liberalization) on economic growth. In case of Pakistan, even no concrete measure for domestic liberalization or for external financial liberalization exists. Majority of the studies use the financial development indicators to measure financial liberalization. Besides this, no study in Pakistan has ever examined the joint impact of financial liberalization on economic growth through a proper measurement of domestic as well as external financial sector. This study intends to fulfill all these gaps by exploring the relationship between financial liberalization and growth employing the variables which reflect the actual liberalization of financial sector in Pakistan. It would not only examine a separate investigation of both the domestic and external components of financial liberalization on economic growth but would also examine the simultaneous impact of financial liberalization on growth.

Chapter 3

State of the Economy & Financial sector Reforms in Pakistan

This chapter studies in detail the financial sector reform process introduced in Pakistan since the late 1980s under the structural adjustment program of IMF. The structure of the financial sector from 1970s till the introduction of reforms (pre-reform era) is also analyzed. This chapter thus presents the evolution of the financial sector both at the domestic and external fronts and process of liberalization followed by the financial sector. However, before discussing financial sector reforms, we present an overview of the economy in terms of some important macroeconomic indicators.

3.1: An Overview of the Macro economy: 1970s till 2010

The growth rate of GDP is **e**xtensively utilized measure of performance of any economy. According to this measure, Pakistan's economy has recorded an average growth rate of over 5 percent during 1972-2010 period. Overall this growth rate is not much disappointing; however the last four decades were marked with different growth episodes. The decade of the 1970s started in Pakistan not only with a separation of the Eastern Wing of the country, but with the nationalization of various segments of the economy under the nationalization policy followed by Bhutto Government. Against an average growth rate of 6.8 percent during the1960s, the growth rate decelerated to almost 5 percent during the 1970s period. It revived to above 6 percent during the 1980s, however, a continuous slow down thereafter till 2004 mark a period of stagnation. A revival of growth in 2004 and onward is once again observed during the last 6 to 7 years. These different growth episodes were also accompanied by different trends in major economic indicators like inflation rate, fiscal deficit, current account deficits or tax revenues. (See Table 3.1)

The slow growth in the 1970s was accompanied with a high inflation of almost 14 percent. A trend of growth rate of GDP versus inflation shows that there has been huge divergence between GDP growth and inflation during the 1970s and 1990s when the inflation peaked to double digit category while growth rate slowed to below 5 percent. (See Fig 3.1). Not only that inflation was high during the 1970s and 1990s but fiscal deficit and current account

deficit as a ratio to GDP were significantly large. Both fiscal deficit and current account deficit were as high as 4.6 and 5.5 percent during the1970s. While the current account deficit reduced to 3.8 percent during the 1990s, the fiscal deficit further increased to a percentage of 6.78 percent. The tax-to-GDP ratio was also low during the1970s at 11percent and it improved to 14 percent during the 1980s, however, it declined to 13 percent during the1990s. (See Fig 3.2 &3.3)

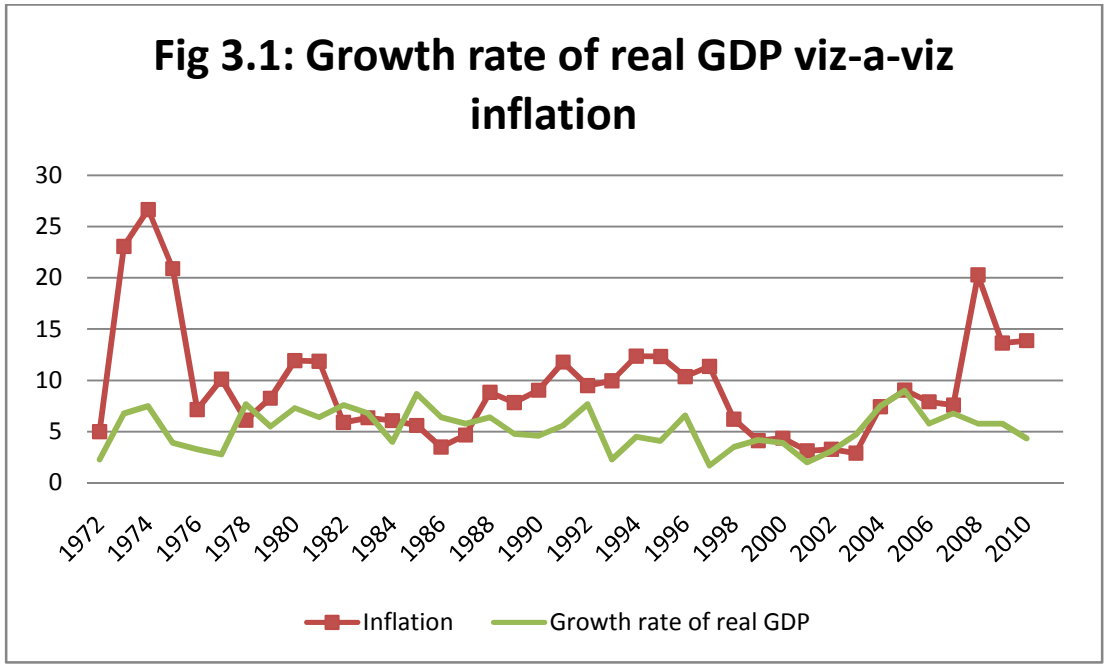
Table 3.1: Trend in Macroeconomic Indicators

Year	Growth rate of real GDP (%)	Inflation rate (%)	Fiscal Deficit (as % of GDP)	Current account deficit(as % of GDP)	Tax Revenue (as % of GDP)
1972-75	5.13	18.91	0.99	6.12	10.27
1976-80	5.32	8.73	8.24	4.9	12.55
1981-85	6.7	7.17	6.27	2.8	13.51
1986-90	5.6	6.78	7.74	3.1	14.14
1991-95	4.84	11.20	7.14	4.5	13.33
1996-00	3.98	7.30	6.42	3.2	12.99
2001	2	3.15	4.27	-2.8	10.49
2002	3.1	3.29	4.28	-5.2	10.74
2003	4.7	2.91	3.70	-4.3	11.40
2004	7.5	7.44	2.30	0.9	10.83
2005	9	9.06	3.34	3.3	10.15
2006	5.8	7.92	3.14	5.3	10.54
2007	6.8	7.60	4.35	5.8	10.26
2008	5.8	20.29	7.56	10.8	10.22
2009	5.8	13.65	5.20	2.6	9.20
2010	4.4	13.88	3.58	0.9	10.1

Source: SBP Handbook (2010), SBP Research Bulletins (various issues), and IFS (2010)

The slowdown in overall economy or deterioration of some leading macroeconomic indicators in the1970s owes to a host of factors. The stagnation of the 1990s is not justified on the same grounds. The stagnation of the 1970s on the one hand owes a great deal to nationalization regime of Bhutto government and on the other hand factors like separation of East Pakistan, oil price shock, floods along with pest attacks were responsible for this slow down. (Zaidi, 2005) The decade of 90s was characterized by waning growth, sluggish tax-to-GDP ratio leading to steadily rising fiscal deficits, double digit inflation, declining exports causing unsustainable current account deficits, deterioration in physical infrastructure and institutional weaknesses resulting in poor governance. (Janjua, 2004) Beside these factors, the

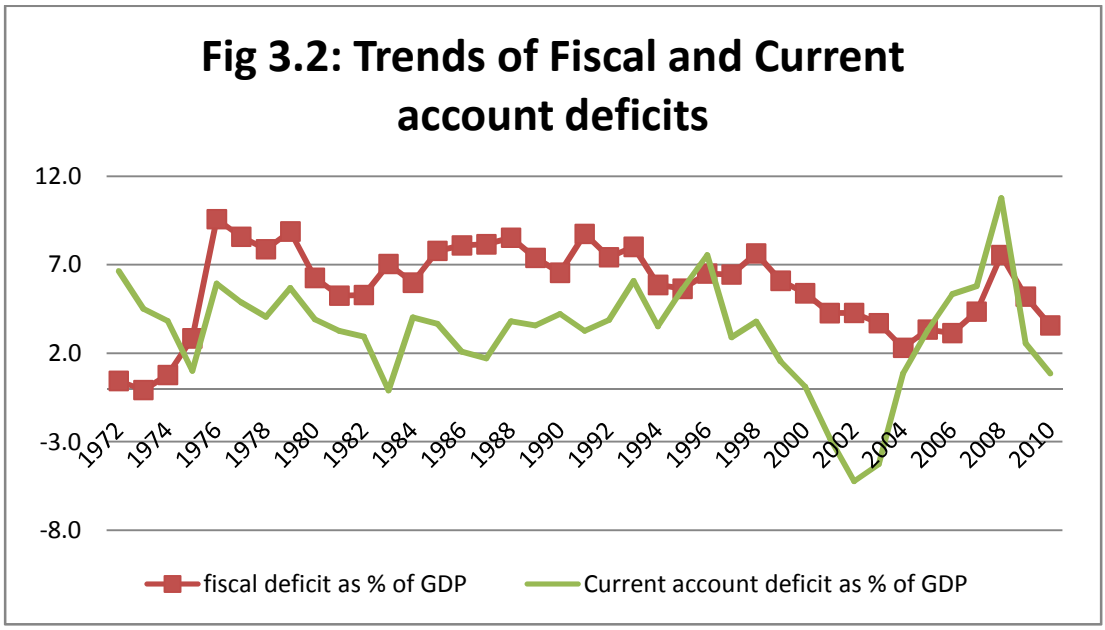
stagnation of the1990s was also on account of sluggish savings, low FDI, and less productive public investment.



Source: SBP Handbook (2010) ,IFS (2010), and Author's own Calculation

The period after the 1990s that is, 2000 onward recorded some improvement. The GDP grew at an average rate of 5.5 percent against 4.4 percent observed during the 1990s. Fiscal deficit and current account deficit also reduced to some extent compared to the 1990s level. Fiscal deficit steadily decreased from 2001 till 2006 (4.27 to 3.14 percent of GDP), however, afterwards it increased to 4.35 percent and 7.5 percent of GDP in 2007 and 2008, respectively. Current account deficit showed a robust trend during 2001-03, when it turned from a deficit of 3.2 percent of GDP during 1990s to a surplus of 2.8, 5.2 and 4.3 percent in 2001, 2002 and 2003 respectively. Current account deficit was exceptionally high in 2010 as it touched to a peak of 10.8 percent of GDP. (See Table 3.1, Fig 3.2). Fig 3.2 clearly depicts a decreasing trend for fiscal and current account deficits till 2005 and a mixed trend thereafter. The situation which improved from 2000 and onward was mainly on account of renewed export growth, restructuring of external debt, resurgence of worker's remittances, reduction in current government expenditure, reduction in imports and a boost in the public sector investment. However, the episode of growth was unsustainable as the improvement till the mid 2000s gradually faded

away. Rising current expenditure along with soaring imports, striking deficit in public saving and current account, and worsening of domestic and external debt once again made the episode of growth unsustainable after 2005. (Mc Cartney, 2011)

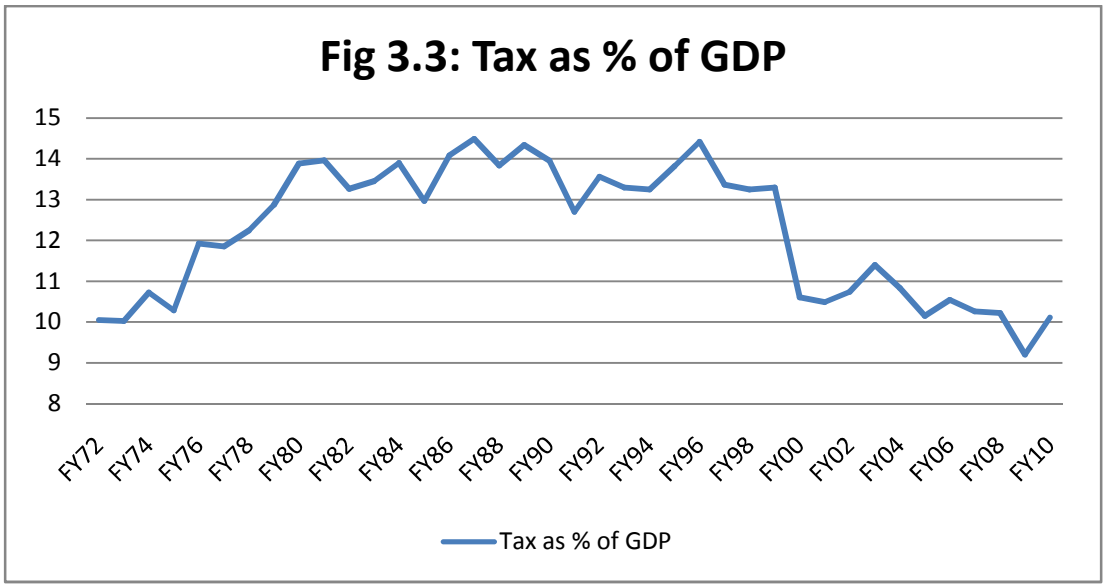


Source: SBP Handbook (2010), SBP Research Bulletins (various issues), IFS (2010), and Author's own Calculation

Inflation rate also showed signs of stability from 2000-2003 as it moved from an average of almost 10 percent in 1990-2000 to 3.15 percent, 3.29 percent and 2.91 percent during 2001, 2002 and 2003. However, 2003 onward, it started to move on an upward trajectory and it reached to as high as 20.29 percent, 13.65 percent and 13.88 percent in year 2008, 2009 and 2010 respectively. In contrast to this, the growth rate during these last three years of the 2000s decade started to slow down (See Fig 3.1). The intensification of inflationary pressures is on account of both domestic and external factors. Excessive government borrowing from the Central Bank to finance huge budget deficits, power breakdown restricting the supply side along with the sharp spike in global commodity prices are major contributors in fuelling the inflation rate in Pakistan after the mid 2000s.

The tax-to-GDP ratio showed no signs of improvement over the 2000-2010 period and on average it even decreased from almost 13 percent of GDP during the 1990s period to 10 percent of GDP during 2000-2010. (See Fig 3.3).The low tax to GDP ratio in spite of introducing

tax reforms highlight the importance of correcting the structural impediments in the economy, along with real implementation of reforms without any political pressure/consideration. Besides this, a match between sources of growth in the economy and tax revenue base needs to be considered. (Economic Survey, 2009-10)



Source: SBP Handbook (2010), SBP Research Bulletins (various issues), Author's own Calculation

3.2: Pre-Reform Era: An Era of Repression (1970 till 1988)

The decade of the 1970s and 1980s is characterized as period of financial repression in the economic history of Pakistan. Directly controlled interest rate movements, control of domestic credit in the form of credit ceiling and directed and subsidized credit, controlled deposit and lending rates, high reserve requirements, segmented and under developed financial markets were the hallmark of Pakistan's financial sector during that period. In January1974, Bank Nationalization ordinance was promulgated and Pakistan Banking Council (PBC) was set up as an administrative body to have an exclusive right on the ownership, management and control of all the banks in Pakistan. Under this nationalization move, fourteen banks were nationalized of which thirteen were merged into five banks. Even the State Bank of Pakistan (SBP) was also nationalized and this points to a unique development in the history of banking world where a country's central bank is simultaneously nationalized along with the commercial banks. (Zaidi,2005) A lack of healthy competition along with a direct control of state in the banking

industry made banking services inefficient. Besides this, the presence of multiple regulatory agencies like SBP and PBC led to further wane the regulatory mechanism of the banking activities.

National Credit Consultative Council (NCCC) was also established in 1972 to determine the distribution of credit in the economy and NCCC became government's main source of managing monetary policy. Under the annual credit plan devised by NCCC, allocation of the credit to various sectors of the economy was made and all rates of return were administratively set by the government. All institutions and stakeholders in money market and other sectors of the economy had to accept these rates and amount of monetary expansion and credit. The control of volume, cost, and allocation of credit thus emerge out as main mechanism of conduct of monetary policy and management during 1972 to 1991 period. (Zaidi,2005)

Unlike the traditional indirect methods of control such as changes in the bank rate and open market operations, the monetary policy was conducted through credit budgeting and credit ceiling. Besides the use of credit ceiling, monetary policy also used instruments such as credit floor, budget subsidies and cash reserves and liquidity requirements**.** A system of on tap and adhoc treasury bills existed at that time and commercial banks were required to buy these bills at fixed rates of return. These bills were exchangeable at any time, however, this captive market behavior made money market inflexible and unstructured. Governments also raised its debt from the instruments that had high rate of return in National Saving Schemes causing the funds to move out of the financial sector to these saving schemes. (Zaidi,2005)

The policy of direct monetary control through the imposition of ceiling on interest rates coupled with directed and rational allocation of credit to priority sectors at subsidized rates had severe impact on banking sector in terms of their ability to respond to the credit demand of the economy. These mandatory allocations of bank credit to priority sectors along with a regime of concessionary interest rates distorted the markets, impede financial deepening and undermine the strength of the financial system.

Capital market in Pakistan during the pre-reform era was equivalently thin in terms of low capitalization, and extensive insider trading. The activities of capital market were mostly confined to Karachi Stock Exchange so it was not effectively complementing the intermediary

role of the banking system. Market for term loans was not a proper part of capital markets as term loans consisted of project financing at subsidized rates through Development Financial Institutions (DFIs). Non banking sector participation was also thin and restrained to few shares listed at KSE. Equity market was also thin on account of an easy supply of money from National banks and DFIs to blue chips making debt a preferred instrument over equity .(Hanif, 2002).

The restrictions on current and capital account transactions were also present on the external front in the pre-reform era. SBP was regulating the foreign exchange market through a system of exchange controls. The foreign exchange market was not working under market based price mechanism and this market was also rigid to changes in demand and supply conditions in the external sector of the economy. Exchange rate was not working under the flexible regime although we shifted to managed float in 1982; however, in reality it was close to a fixed rate regime and was not a true reflection of the market imbalances. (Hanif, 2002).

The financial repression policies adopted in the pre reform era finally resulted in financial inefficiency, private sector crowding out, deteriorating assets quality and increasing vulnerability of the financial institutions. The pre dominance of state owned financial institutions was to such an extent that they were holding almost 94 percent of the total assets of the financial sector during the late 1980s. The financial institutions were thus unsound on account of high intermediation cost due to overstaffing, amassing non-performing loans, low quality banking services, and insufficient market capitalization. (Khan and Qayyum, 2007). The result of these repressive policies was in the form of severe macroeconomic difficulties the country stared to face during the late 1980s. The inefficiencies and distortions in fact closed all the level playing fields to the private sector for competition and growth.

3.3: Financial Reforms in Pakistan:

Realizing the intrinsic weaknesses of the financial sector emerged on account of repression policies of the 1970s and 1980s, the government of Pakistan started the process of financial reforms under the recommendations of International Monetary Fund (IMF) and the World Bank in the late 1980s. Under the Financial Sector Adjustment Loan (FSAL), a loan of $150 million was provided in 1989 and $ 200 million in 1997 by the World Bank. Building on FSAL, another loan of $ 216 million was awarded under Financial Sector Deepening and

Intermediation Project (FSDIP) in 1995. Besides this, World Bank also granted another loan of $300 million under Financial Structure Restructuring and Privatization Project in 2001. These international institutions thus not only provided the technical assistance but also the much needed financial assistance (Hanif, 2002).

The objective of the reforms, introduced under the directives issued by the World Bank and IMF and in the dire need of the country, was multifold. Reforms were undertaken on the one hand to move to a market based system of exchange, monetary, and credit management while on the other hand to improve prudential regulations, strengthening corporate governance and supervision and empowering the central bank of the country. These measures were expected to provide an equal opportunity for financial institutions and markets by instilling competition, removing the distortion and segmentation in financial markets. These were intended to increase competition, efficiency and productivity of the financial sector.

Details of the reforms/measures taken in the late 1980s are given below:

3.3.1: Encouraging new banks to enhance competition

1. Privatization of Banks

To address the inefficiencies resulting from repression policies of the 1970s and 1980s and to enhance competition in the banking industry, a process of privatization was initiated in 1991. Banks Nationalization Act 1974 was amended to empower the Federal Government so that it can sell entire or partial share capital of nationalized commercial banks (NCBs). Out of the six NCBs, two of them namely ABL and MCB were privatized during 1991-93 and their management was transferred to the private sector while Habib Credit and Exchange Bank was privatized in June 1997. UBL was also privatized in 2002. HBL was also offered for privatization in 2003. Its 51 percent shares were successfully bid by Agha Khan Fund for Economic Development and bank's management was shifted to the fund in 2004. (Janjua 2004).

2. Opening of New Commercial Banks

The amendment in the Banks Nationalization Act 1974 also allowed the establishment of new banks in the private sector to ensure greater competition in the banking industry.

Accordingly, permission was granted to ten new Pakistani commercial banks to start their operation in 1991. Later on, eleven more new banks were also given the permission to commence commercial banking. The Bank of Khyber and the Bank of Punjab (provincial banks) were also given the status of listed banks in 1994. However, a suspension of opening of any new bank till April 2002 was imposed in 1995 to contain the burgeoning growth of Banks. Opening of new branches by state-owned banks were also banned in December 1996 and they were further ordered to close unprofitable ones in 1997. Contrary to this; domestic private banks and foreign banks branch policy was liberalized in order to provide them the opportunity to flourish. Micro Finance Bank Ordinance was also promulgated in 2000.The SME bank was also established in January 2002. (Janjua, 2004)

3. Non Bank Financial Institutions (NBFI)

The NBFI were allowed to flourish during the 1990s in order to lessen the dependence on banks for credit and to further deepen and broaden the financial markets. The number of NBFIs as of end March 2004 was 100. Besides this, mergers and amalgamation were also encouraged to reduce inefficiencies. (Janjua, 2004)

3.3.2: Rationalization of Interest rate Structure:

Interest rate rationalization under the reform program was carried out in three main dimensions namely public debt, caps on lending and deposit rates and concessional rates.

The government started a full fledged auctioning system of public debt in March 1991, and system of on-tap and *ad hoc* treasury bills prevalent in the repression era were discontinued. In order to produce a long term yield curve of government securities, longer term instruments in the shape of Federal Investment Bonds (FIBs) of three, five and ten years were introduced, which provide a pricing benchmark for private sector securities. These FIBs were, however, replaced by Pakistan Investment Bond available in maturities of 5 to 10 years in December 2000. (Zaidi,2005)

Regarding the caps on banks' lending and deposit rates, apart from the concessionary finance schemes, limits on all other banks maximum lending rates were removed earlier in 1995. Minimum lending rates were also eliminated on July 26, 1997. Further liberalization of interest

rate permitted the banks and other financial institutions to establish their own deposit rates from June 1998 onwards. Liberalization in interest rate structure was in fact made to offer the banks an opportunity to charge market prices, thus enabling them to make higher profits as compared to the era of repression.(Hanif, 2002).

In order to discourage misuse of credit and a credit burdened by subsidies, no new concessional finance scheme was to be devised. Besides this, the margin of subsidy on special financial schemes including LMM and export finance was reduced.(Hanif, 2002).

3.3.3: Monetary and Credit Management:

In order to move from a highly controlled monetary and credit management toward a market based monetary and credit system, a number of fundamental changes were made. Besides the introduction of public debt auctions, other significant measures were taken in this regard.

To switch over to indirect methods of controlling monetary and credit expansion, the credit ceiling was eliminated with effect from August, 1992 and replaced by Credit Deposit Ratio (CDR), which was also abolished with effect from September, 1995.

Open market operations (OMOs) became the main instrument of market based monetary management from 1995. As part of the market orientation of monetary management, the intermediate target of M2 was to be realized through controlling the desired path of the reserve money. Either way of OMOs that is repo or reserve repo transaction was used to correct any deviation of actual supply of money.

To implement market oriented monetary policy and bring in flexibility in accommodating short term liquidity requirements, 3-day repo facility was introduced from February 1, 1992 and the discount window was closed.(Hanif, 2002).

3.3.4: Regulatory Reforms:

The liberalization regime pursued under the reform process in the financial sector required more thoroughness and power by the top institutions to achieve its objective. In order to strengthen the regulatory framework of the apex institutions in the financial sector, following regulatory reforms were undertaken.

1. Autonomy of the Central Bank and its Restructuring:

The State Bank of Pakistan (SBP) was made independent in February 1994; however issuing of three amendment ordinances in 1997, namely, State Bank of Pakistan Act 1956, Banking Companies Ordinance 1962 and Banks Nationalization Act 1974 provided additional strength to this autonomy. The autonomy granted under these new amendments gave the State Bank now an exclusive right to conduct an independent monetary policy, regulate the banking sector, and to set limit on government borrowing from the Central Bank. Under the amendment in Bank Nationalization Act, Pakistan Banking Council was also abolished.

Apart from granting of the autonomy to SBP, it has also been subject to restructuring since 1994-1995. The core and non-core functions of SBP were separated in 1999-2000, while SBP Banking Service Corporation (SBP: BSC) was established in January 2002. With the establishment of BSC, SBP has been bifurcated into two entities. Where SBP'S role is to frame and conduct monetary policy, supervise and regulate the financial sector, foreign exchange management and payment system, BSC responsibility lies with the retail banking and treasury functions.(Hanif, 2002).

2. Prudential Regulation:

Prudential regulations are in fact very important aspect of financial liberalization under which the interests of the ultimate user of the service is safeguarded besides the viability of service provider. Besides other important measures undertaken under the liberalization regime, SBP also issued new prudential regulations regarding the operations of the banks and NBFIs mandatory with effect from July 1, 1992. The prudential regulations not only prescribed credit and risk exposure limits but also provided the different standards and norms such as management criteria, regulations regarding the payment of dividends, and rules to check money laundering and other illegal activities.

The capital adequacy ratio requirement was enforced in line with the Basel Accord under which a system of risk weighted capital was to be adopted by the banks. Effective December 1997, all banks in Pakistan were required to maintain capital and unencumbered general reserve equivalent to 8 percent of their risk weighted assets. Since December 1997,CAMELS framework

is also operational in Pakistan for on site supervision/offsite surveillance. In addition to capital adequacy ratio requirement, it is also involved in the study of financial indicators for management soundness, asset quality, earning and profitability liquidity and sensitivity to market risks. In the light of the emerging development, amendments and modifications have been made in the prudential regulations in subsequent years. (Zaidi,2005)

To address the issue of default and non–performing loans and to ensure the expeditious recovery of stuck up loans, financial institutions (Recovery of Finances) Ordinance 2001 was disseminated with strict legislative provisions. This was complemented through the establishment of Corporate and Industrial Restructuring Corporation (CIRC). (Hanif, 2002).

3.3.5: Capital Market Reforms:

With the objective of creating a favorable policy environment for instilling competition and broadening market base, capital market reforms were considered as a vital element of overall reform process. Beside the emphasis on strengthening of governance, institutions, regulation, and supervision, an important target under capital market reforms was the creation of a corporate debt market. Certain measures taken for the development of capital market in Pakistan include the following:

PACRA (a credit rating agency) came into existence in August 1994. This was followed by another credit rating agency named DCR-VIS Credit Rating Co. Ltd. in 1997, whose name was afterwards replaced by JCR-VIS Credit Rating Co. Ltd. To implement paperless trading in stock exchanges, Central Depository Company (CDS) was established in 1997. Besides facilitating the transfer of stock ownership and efficiently handling the enormity of stock trade volumes, CDS was also meant to minimize the risk of damage and loss, forgeries and duplication of trade securities. In 1997, Government also devised a Capital Market Development Program (CMDP) in collaboration with Asian Development Bank (ADB). This program was intended to create a level playing field to enhance competition, develop a corporate debt market, modernize market infrastructure and its linkages, reform mutual fund industry and promote contractual saving through reform of insurant sector and pension and provident fund. (Hanif, 2002).

The Securities and Exchange Commission of Pakistan (SECP) was established under SECP Act in 1997 and corporate law Authority was replaced by SECP in 1999 when it started operating as an autonomous body. By increasing the regulatory powers of SECP, the governance structure of stock exchanges has been improved. (Financial sector assessment, 1990-2000)

3.3.6: External Sector Reforms:

In accordance with the transitional arrangement under Article XIV of the Article of Agreement of the IMF, Pakistan had maintained for a long time a number of restrictions on the payments and transfers for current international transactions. Liberalization of exchange and payment regime in fact started since February 1991 in Pakistan. Pakistan, however, has moved to managed float exchange rate system in 1982. The liberalization of the external sector encompasses the following broad based measures:

In July 1994, Rupee was made convertible on current international transactions under the IMF Article VIII.

To attract the foreign money detained out of the country, Pakistani residents were permitted to open and maintain foreign currency accounts with banks in Pakistan on the same basis as non-residents. These accounts were freely transferrable abroad and besides the exemption of wealth and income taxes on these accounts, no questions were asked about the source of income.

All sectors/industries were opened to foreign investors for investment except certain specified one. Not only that foreign investment in these industries was allowed without prior approval, but investors could purchase up to 100 percent equity in industrial companies on repatriable basis. There was no restriction on repatriation of disinvestment proceeds/capital, profits and dividends. (Financial sector assessment, 1990-2000)

Special Convertible Rupee Account (SCRA) was opened in 1996-97 and inward portfolio investment was allowed without any prior approval provided the transactions take place through SCRA. Foreign investors were thus allowed to make investment in listed securities on stock exchange through these accounts. (Janjua,2011). To purchase residential flats, plots, houses in

Pakistan, authorized dealers, DFIs and housing finance institutions were allowed to grant rupee loans to Pakistani nationals working outside Pakistan. (Hanif, 2002).

In February 1998, Authorized Dealers (AD) were granted the permission to decide their own exchange rates for currencies, with the exception of US dollar.

Pakistan ER system was working under a managed float till July 1998, when a new mechanism in ER regime was introduced. This comprised of an official exchange rate and a floating inter bank exchange rate (FIBR). This multiple ER system was replaced by a market based unified exchange rate system in May 1999 when FIBR became applicable to all foreign exchange transactions. In addition to the adoption of a unified ER system, the condition for the AD to surrender all foreign exchange receipts to SBP was also eliminated. The rupee was put to a free float in July 2000, and this was considered to be a major achievement in the area of exchange rate management. (Financial sector assessment, 1990-2000)

Besides the above mentioned reform process undergoing in the economy, several events at the domestic level as well as at the external front have been happening. The period accompanying the introduction of new ER regimes was also accompanied with the imposition of economic sanctions on account of nuclear test conducted by Pakistan. Pakistan was economically isolated by the international community while the aid and assistance by World Bank, IMF or other bilateral donors was terminated. Foreign currency accounts were also frozen. The aftermath of nuclear explosion had severe negative consequences for economy in terms of significant fall in workers remittances, depletion of foreign exchange reserves, a significant erosion of domestic currency etc. However, the event of 9/11 and Pakistan's alliance with the US against the war on terror paved the dividends in the form of withdrawal of economic sanctions, substantial write-off of bilateral debt, and re profiling of Paris club debt. The diversion of worker 's remittances through official channel helped build up the foreign exchange reserves, contributed to the stability of exchange rate and provided liquidity to money market.

Another major events post 9/11 has been the stock market crash of 2005, where by the KSE 100 index significantly dropped by almost 1400 points. This was followed by another episode of KSE- 100 index drop of almost 1500 points in 2006. Another intensive crash was observed in 2008 when KSE-100 index substantially lost its value by almost 10,000 points. This

intensive crash led the Board of Directors of Karachi Stock Exchange to place a floor at the level of 9144 points in August 2008 which was later on removed in December 2008. The reason for 2005 and 2006 crash can be attributed to hold of speculators and bad governance in the stock market. However, the crash of stock market in 2008 was on account of not only the political instability emanating from a regime change but also on account of weakening of economic fundamentals especially the rapid depletion of foreign reserves, a significant fall in the value of rupee and a spike in inflation.

Another important event in 2007 which started off from the collapse of US mortgage and housing markets (sub prime crisis) turned into global recession of an amplified nature whose effect was felt worldwide. This economic downturn severely influenced the developed as well as emerging economies around the globe, with not only their financial sector hurt by this slowdown but also a negative severe impact observed by their commodity producing sectors. Pakistan was not an exception, as the effect of the crisis was also felt by Pakistan but that was of minimal nature. The effect of financial crisis though in a limited manner have been felt by the real sector of the economy through a decrease in global demand and a resultant fall in commodity prices. The financial sector of the economy on account of its developing nature and less integration with international financial markets remained less influenced by this slowdown. The risks to financial stability were also contained on account of resilient banking industry, a vigilant regulatory environment and no direct exposure to securitized instruments. However, through a feed back impact, financial sector was influenced through real sector as a result of global recession, commodity price hike, political instability and deteriorating macroeconomic indicators. (Ali, 2009).

3.4: Current Structure of the Financial Sector

Different measures under the financial liberalization regime adopted in Pakistan and subsequent developments thereafter have altered the financial structure of the economy. Today, the financial sector of Pakistan consists of different entities involved in the transactions of financial instruments in money, capital and foreign exchange market. These functions in the financial market are performed by a number of financial institutions like specialized banks,

commercial banks, development finance institutions, national savings schemes, insurance companies, stock exchanges etc.

Several policy shifts and development both in the domestic financial markets and external financial sector are responsible for a change in the financial landscape of the economy. Important changes both in terms of consolidation as well as diversification have taken place in the financial sector of Pakistan. The activities of the banks and DFI have been extended to non–traditional areas of insurance, asset management, brokerage, and leasing. The SBP supervises and regulates the financial institutions such as Commercial Banks, Islamic Commercial Bank, Development Financial Institutions (DFIs), Micro Finance Banks and foreign exchange companies. While rest of the financial institutions are supervised by authorities such as Securities and Exchange Commission of Pakistan.(Osec, 2011).

The banking sector in Pakistan has been transformed significantly since the introduction of reforms in 1990s. From a state domination of the banking industry in the early 1990s, the private sector participation has increased remarkably during the recent years. Today the banking sector in Pakistan includes 36 commercial banks (including 4 public sectors commercial banks, 25 local private banks, and 7 foreign banks) and 4 specialized banks. (Osec, 2011) The detail of the listed banks working in Pakistan as on June 30, 2010 is given in Appendix 1, Table A 1.

Today, the state ownership of the banking industry in terms of assets, advances, investment etc. has decreased significantly from its 1990 level. More than 90 % of the banking assets belonged to state owned banks in 1990. In contrast to this, today private banks own more than 70 percent of the banking assets. (See Table 3.2) Not only that asset structure of the banking sector has changed significantly but privatization of the state owned banks has replaced bureaucracy and lethargy by bringing in professionalism and service orientation. Improvement in the banking technology in the areas of customer services, on line banking, ATMs, internet banking, etc., has reduced the transaction cost to the banks.

Table 3.2: Structure of Financial Sector in Pakistan (end-June 2012) (share in %)

	Branches (No.)	Assets	Advances	Investment
Commercial Banks				
State-Owned	1,748	18.7	22.3	14.6
Private	7,498	76.7	72.6	81.7
Foreign	55	2.8	1.8	2.8
Specialized Banks	546	1.8	3.3	0.9
All banks	9,847	100	100	100

Source: Statistics and Data ware House Department SBP (2012), Author's own Calculation

The competition in the banking sector in Pakistan has no doubt increased on account of privatization in the banking industry. However, if we look at the market share (concentration) of few large banks in Pakistan its still high. Table 3.3 reports the market share by size of the banks from 2000-09. The share of the top five banks has reduced to 50.8 percent in 2009 as compared to 63.2 percent in year 2000. The share of top 10 banks has only marginally reduced from 76.5 percent to 73 percent. While the share of the smallest five banks despite of increasing has declined further to 0.5 percent in 2010 from 0.7 percent in 2000.

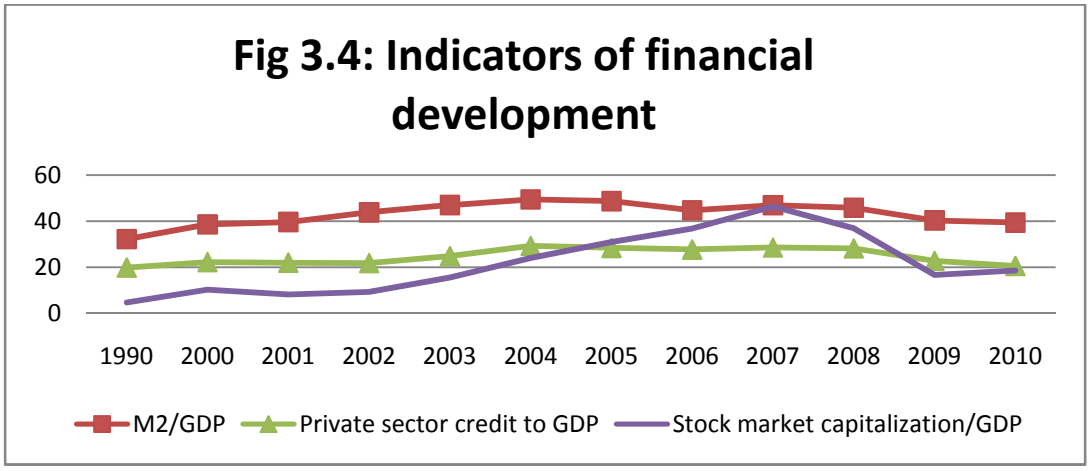
Table 3.3: Market share by Size of Banks in Pakistan (in %)

year	Share of top 5 banks	Share of top 10 banks	Share of smallest 5 banks
2000	63.2	76.5	0.7
2001	61.2	75.8	0.6
2002	60.8	76.7	0.4
2003	58.8	75.1	0.3
2004	56	73.1	0.5
2005	54	72.5	0.5
2006	52.3	75.1	0.6
2007	52	74.6	0.6
2008	52.4	73.6	0.6
2009	50.8	73	0.5

Source: Osec, Business Network Switzerland, 2011

Certain financial sector development indicators have also recorded an improvement after the introduction of reforms. The improvement in some of the leading financial sector development indicators (e.g., M2/GDP, private sector credit to GDP, stock market capitalization to GDP) are shown in Fig 3.4. These financial sector development indicators are in fact a measure of financial deepening and financial intermediation of an economy. The overall increasing trend of these

indictors highlights the importance of financial deepening and financial intermediation which has been achieved on account of financial liberalization. M2/GDP has increased from an average of 32 percent during 1990s to an average of almost 45 percent during 2005-2010. Private sector credit to GDP has also increased from 20 percent in 1990s to 28 percent in 2008, but a declining trend for 2009-2010. The massive improvement is observed in the indicator of stock market capitalization/GDP which has increased from a low level of 6 percent in 1990s to a high average of 32 percent during 2005-2010.



Source: Khan and Qayuum (2007) and SBP Statistical Bulletin (various issues).

In terms of some leading indicators of financial development, an increasing trend has been observed in recent years, however, another very important indicator of financial efficiency, the interest rate spread portrays a different story. Interest rate spread has actually increased in spite of decreasing from its 1990s level. Table 3.4 shows that deposit rates for most of the periods have been negative in real terms, while the corresponding lending rates are very high (ranging from negative 7.54 percent to a 10.9 percent). The resultant increase in the spread is obvious in Table 3.4, which shows an increase in spread from 5.95 percent in 1990-95 to 6.67 percent in 2012.

Table 3.4: Interest rate spread in Pakistan

Year	Weighted Average Lending rate(Real)	Weighted Average Deposit rate(Real)	Interest rate spread
1990-1995	1.98	-4.05	5.95
1996	3.6	-4.4	8
1997	2.8	-5	7.8
1998	7.8	-1	8.8
1999	9.1	0.8	8.3
2000	10.9	1.9	9
2001	9.21	0.87	8.34
2002	9.69	0.11	9.58
2003	6.3	-1.49	7.79
2004	2.68	-3.65	6.33
2005	-0.49	-7.93	7.44
2006	2.01	-3.20	5.21
2007	2.72	-2.27	4.99
2008	-7.54	-13.26	5.72
2009	0.67	-6.07	6.74
2010	-0.66	-7.08	6.42
2011	0.33	-6.70	7.03
2012	2.08	-4.59	6.67

Source: Khan and Qayuum (2007), SBP Statistical Bulletin (Various Issues),Author's own calculation

Pakistan's banking sector is working under the CAMELS framework introduced since Dec 1997. The capital adequacy ratio of most of the banks is well above the required level of 10 %. The road map for Basel II has already been issued in 2006 and capital requirement on the basis of Basel II are now mandatory for all banks and Development Finance Institutions (DFIs) operating in Pakistan. Besides the dominance of private sector in today's banking industry, the structure of the financial sector is composed of mechanism of market based monetary policy, market determined interest and exchange rates, full current account convertibility with partial but substantial capital account liberalization, and development in securities market. The money market and foreign exchange market in Pakistan today work on the price–based mechanisms. The monetary and credit policy today are conducted through the market based instruments such as Open Market Operation (OMOs), change in CRR and SLR while the foreign exchange market works under the market determined exchange rate through changes in supply and demand. (SBP, 2010).

Reforms have been helpful in correcting the existing flaws in banking sector in Pakistan. Positive outcome has been achieved on account of reforms introduced in 1990s. According to Abbas and Malik (2010), an improvement in the efficiency of banks (indicated by cost inefficiency scores) has been observed during 1990 to 2006. However, despite all these developments and improvements observed in the financial sector of Pakistan on account of financial reforms, there are still some important issues relevant to financial sector in Pakistan. The efficiency of banks for instance is criticized on account of low return on deposit beside the costly access to banking services. Despite the improvements achieved in customer services in post reform era as compared to pre reform era, there are still the transaction costs and time lags involved in operation or management of customer transactions. Besides this, even after switching to an indirect system of credit management, the distribution of credit is still skewed toward the priority sectors (government and textile sector). Non performing loans not only in high magnitude but their poor recovery also question the management of banking industry. (Abbas and Malik (2010)). These issues need to be addressed on immediate basis in order to get more benefits from the reform process.

While the current account in Pakistan is fully convertible, capital account is partially liberalized. There are no restrictions on inflow of FDI but outflow of FDI requires SBP's prior approval and detailed justifications. Similarly, there are no restrictions on portfolio inflow as long as they are routed through Special Convertible Rupee Account (SCRA), however, portfolio investment abroad is not permissible. Only locally established mutual funds are allowed to invest abroad to the extent of 30 % of the aggregate funds mobilized, in permissible categories subject to a cap of US $15 million at any given time with a prior approval of SBP and SECP. Foreign currency borrowing from abroad is allowed subject to certain terms and conditions and registration of loan with SBP and authorized dealer. Foreign currency lending abroad is completely restricted. (Janjua, 2011). In terms of capital account convertibility, Haque (2011) further points out that Pakistani economy today is by and large free of restrictions. The only prominent restriction is on the amount of domestic currency that a traveler may physically carry overseas and on the amount Pakistani residents may hold in overseas bank accounts. However, the actual integration of Pakistani economy into the global economy in comparison to other emerging markets is still limited.

The foreign exchange regime in Pakistan has also evolved from restrictive environment toward more liberalized and stable environment through prudent exchange rate management. The adoption of floating exchange rate since July 2000 has allowed the absorption of a change in capital flows in a change in the exchange rate rather than an over supply of reserves. No more additional market support is provided to exchange rate and is not tampered by the SBP. The depreciation of exchange rate is allowed by SBP to ward-off continued pressure from import demand. However, in order to prevent loss of foreign exchange reserves some measures have been introduced to ease import demand.(Mahmood, 2012).

This chapter has thoroughly examined the process of financial liberalization undertaken in Pakistan on advice of IMF/world bank in the background of repression policies of 1970s and 1980s. The prevalence of repression in the form of administered interest rates, directed and subsidized credit, controlled deposit and lending rates, high reserve requirements, thin capital markets and control on current and capital account transactions resulted in segmentation and under development of financial markets thus creating financial inefficiency, private sector crowding out, deteriorating assets quality and increasing vulnerability of financial system. The reforms undertaken in domestic as well as external financial sector of the economy have succeeded in moving the financial sector from a repressed environment toward market based indirect system of monetary, exchange and credit management. The reforms have also removed distortions and segmentation in the financial markets and intensified the competition among financial institutions in the country.

Financial reforms have successfully transformed the financial structure of the economy. The state ownership of the banking industry in terms of assets, advances, investment etc. has decreased significantly from its 1990 level. Today private banks own more than 70 percent of the banking assets. Financial sector work under the mechanisms of market based monetary policy, market determined interest and exchange rates, full current account convertibility with partial capital account liberalization, and development in securities market. The foreign exchange regime is more liberalized and working under floating exchange rate regime since July 2000. Exchange rate is not tampered by SBP and work under market based price mechanism. Current account is fully convertible while capital account is partially liberalized.

The financial structure of the economy has no doubt transformed and improved on account of financial liberalization; however, in order to get more pronounced benefits, the macro economic indicators such as inflation, budget deficit, tax to GDP ratio etc. needs to get strengthened. Furthermore financial sector itself needs to grow at faster pace, to meet not only the domestic requirements but to successfully integrate itself with the international markets. The further development and broadening/deepening of financial sector will be helpful in achieving higher and sustainable growth through the efficient utilization of domestic and foreign resources. Besides these broad based benefits offered by the liberalization of financial sector, nevertheless, we need to carefully deal with the costs attached to a full liberalization of capital account/external financial liberalization and the challenges faced by the economy in terms of macro economic management or real cost of unhindered capital.

Full liberalization of capital account in terms of removal of restrictions on all inflows and outflows in the presence of weak institutions, under developed and poorly regulated financial sector and weak economic fundamentals can lead to misallocation of foreign capital, making the economy more vulnerable to financial crisis. The unhindered capital flows can also lead to banking and currency crises thus leading to financial instability in the economies undertaking full liberalization of their capital account. So further opening of the external financial sector of Pakistan should be dealt carefully.

Chapter 4

Methodology

We specify an assorted model that is inspired by Berthelemy and Varoudakis (1996) in which the growth rate of output is determined with the interaction of the financial sector along with the usual consumers and firms sides of an economy. With the inclusion of the financial sector in classical economic structure of an economy where consumers maximize utility subject to budget constraint while firms optimize profits we will deduce as to how liberalization of a financial sector can affect growth rate.

We start the model with the usual optimization process, where consumers maximize their utility function subject to the budget constraint. The time horizon for these consumers is infinite and the supply of labor is inelastic. The real yield on financial intermediaries (V) is "r" on which consumers hold claim. The real rate of interest (r) is defined after adjusting for financial intermediation cost from the net marginal productivity of capital (R). Further assuming perfect foresight [2] and an instantaneous iso-elastic utility function [3] .The objective function of representative consumer along its flow budget constraint are given as

$$\text{Max} \quad U_O = \int_O^{\infty} \frac{C_t^{1-\sigma} - 1}{1-\sigma} e^{-\rho t} dt \ldots \qquad (1)$$

Subject to

$$\dot{V} = rV_t + w - C_t \quad \ldots \qquad (2)$$

The objective function described in Equ (1) is an instantaneous iso-elastic utility function and is known as constant relative risk aversion (or CRRA) utility function. The explanation of

[2] Perfect foresight implies accurate and precise forecast about the future(i.e., there is no uncertainty).

[3] This utility function is used to express utility in terms of consumption.

different variables and parameters pertaining to the objective function and budget constraint is given as:

"σ" is the coefficient of relative risk aversion.

"ρ" is the pure rate of time preference (discount rate).

"w" is the real wage rate.

"C" is the consumption of goods in real terms.

Applying the Hamiltonian and solving the above optimization problem[4], we derive the usual Keynes-Ramsey condition:

$$\frac{\dot{C}_t}{C_t} = \frac{1}{\sigma}(r - \rho) \quad \ldots \quad (3)$$

The growth rate of consumption obtained in Equ (3) states that consumption rises if real return on capital exceeds the rate at which consumer discount future consumption and vice versa.

Next, we introduce firms in the model. Firms are symmetrical and have constant return to scale technology. Considering a simple Cobb-Douglas production function where output is a function of capital and labor, we have

$$Y = A K^{\alpha} L^{1-\alpha} \quad \ldots \quad (4)$$

Where,

"Y"represents the total output produced.

" K"represents the capital employed to produce Y.

"L"represents the labor employed to produce Y.

[4] The solution/derivation of the optimization problem is provided in appendix 2.

"A" represents the technical progress that is endogenised by following Romer (1986) model and the well known AK model of Rebelo (1991). By endogenising the technical progress we mean that it does not exogenously determine the growth rate of output as in the case of traditional Solow and other Neo-classical growth models. Rather the technical progress in this case is learning by doing/innovation, knowledge spillover that positively impacts the growth rate of output.

Now we proceed further by introducing a financial sector in the economy. The financial sector in this economic model acts as intermediary between the consumers and the firms. The mechanism involved works as consumers deposit their money or savings in the banks; banks act as financial intermediaries, give consumers or deposit holders an interest rate "r" on their deposits. Banks, in turn, advance this money to firms as capital which firms invest and banks charge an interest rate on these loanable funds. So the physical capital "K" in the above equation is intermediated by the financial sector. An improvement in the allocation of saving to investment through the financial intermediaries is catered by this capital. This mechanism and change in capital stock ($\dot{K}$) is described in Equ (5):

$$\dot{K} = \phi . \ S \qquad \ldots \qquad (5)$$

The proportion of saving funelled toward investment (ϕ) along with total savings thus make up a change in capital in Equ (5). We are assuming here that the financial sector is mobilizing the saving and advancing the loans to firms in the form of capital, that they are using for investment and hence contributing in the long run growth of the economy. If the financial sector is liberalized, in terms of interest ceiling, credit rationing, reserve requirement, capital account liberalization, etc., it will channelize the funds more efficiently to their most productive uses, it will increase the proportion of saving funneled toward investment and from the relation described in Equ (5) it will automatically increase K.

In order to derive the growth rate of output, which is positively influenced by the liberalized financial sector, based on the preceding discussion of the model we need to arrive at the value of "r" which should be substituted in Equ(3) to get the growth rate of output. For that

we proceed further by writing the production function in Equ (4) in per capita terms as the following

$$y = A \left(\frac{K}{L}\right)^{\alpha}$$

or

$$y = A.k^{\alpha}$$

Marginal Productivity of capital (MPk) from the above equation takes the form as

$$MPk = \alpha A.k^{\alpha-1}$$

To derive the value of "k", we write Equ (5) in per capita form

$$\frac{\dot{K}}{L} = \phi . \frac{S}{L}$$

or

$$\frac{\dot{K}}{L} = \phi . s \quad \ldots \quad (6)$$

R.H.S. is in per capita terms, in order to convert L.H.S. in per capita form we take derivative of k (per capita capital) w.r.t. time"t" so that we get value of $\frac{\dot{K}}{L}$

$$\frac{\dot{K}}{L} = \dot{k} + kn$$

Putting this value of $\frac{\dot{K}}{L}$ in Equ (6) we have

$$\dot{k} + kn = \phi . s$$

$\dot{k} = - kn + \phi . s$

The above equation is the dynamic equation of per capita capital. Since at the steady state

$\dot{k} = 0$, this implies that

$0 = - kn + \phi . s$

$kn = \phi . s$

Or

$k = \frac{\phi s}{n}$

Where "s" represents per capita savings and taking the value of n=1(which means growth rate of population is almost constant), we get

$k = \phi . s$

Putting the value of "k" in MPk equation we get

$MPk = \alpha .A. (\phi .s)^{\alpha -1}$ … (7)

Equ (7) states that the MPk is influenced by the "A", the technical progress (learning by doing/innovation), "ϕ" (the proportion of saving funelled toward investment) and "s" (the saving rate).

We have defined in the beginning of the model that "R" represents the net marginal productivity of capital and this "R" is also the real rental price of capital in the market, which is equal to

$R = r (1+i)$ … (8)

where “r” represent the real rate of interest and “i” denote the margin of financial intermediation in Equ (8). Equ (8) states that real rental price of capital is equal to real rate of interest(r) plus financial intermediation cost (ri).

Since “R” is also the MPk therefore we can replace left hand side in Equ (7) with the value of R

$$r(1+i) = \alpha .A.(\phi .s)^{\alpha-1}$$

From here, we derive the value of “r”

$$r = \frac{\alpha A \phi .s^{\alpha-1}}{1+i} \quad \ldots \qquad (9)$$

Putting this value of “r” in Equ (3) we get

$$\frac{\dot{C}_t}{C_t} = \frac{1}{\sigma}\left(\frac{\alpha A \phi s^{\alpha-1}}{1+i} - \rho \right) \ldots \qquad (10)$$

Since we know that at the steady state everything grows at the same rate; that is, $\frac{\dot{C}}{C} = \frac{\dot{K}}{K} = \frac{\dot{Y}}{Y}$, so we can replace the L.H.S. in Equ (10) with $\frac{\dot{Y}}{Y}$

$$\frac{\dot{Y}}{Y} = \frac{1}{\sigma}\left(\frac{\alpha A \phi s^{\alpha-1}}{1+i} - \rho \right) \ldots \qquad (11)$$

Equ (11) defines the relationship between growth rate of output and other variables pertaining to consumers, firms and the financial sector. Since our interest is in linking the financial sector liberalization with growth so it is obvious from Equ (11) that the financial sector variables like ‘i” (the margin of financial intermediation) negatively affect the output growth. While “ϕ” the proportion of saving funneled toward investment is positively affecting the growth. A liberalized financial sector has larger“ϕ”, it channelizes the funds to the most productive uses, allocate capital efficiently, have a high ‘r’ and low ‘ i’ and thus contribute

positively to economic growth. Besides the explanation of "i" and "ϕ", a greater "r" which is cumulatively represented by this fractional figure ($\frac{\alpha A \phi . s^{\alpha-1}}{1+i}$) is positively affecting the growth rate on account of a low financial intermediation margin, a high proportion of saving funneled toward investment, and a high saving rate thus giving depositors a high real return on their deposits. "A" also positively affects growth rate because learning by doing/innovation and knowledge spillovers present in liberalized financial sector enhance the growth of that sector and hence the overall growth of the economy. Finally "s" the saving rate also contributes positively to the growth rate of output in a more liberalized financial sector.

In the preceding paragraph, we have mentioned that "ϕ" , "s", and ' i' are financial sector variables and in a liberalized financial sector how they affect the growth rate of output. Hence we can call $\frac{\phi . s^{\alpha-1}}{1+i}$ in eq (11) as representing financial liberalization (fl) variables. Replacing $\frac{\phi . s^{\alpha-1}}{1+i}$ by fl in eq (`11), we get

$$\frac{\dot{Y}}{Y} = \frac{1}{\sigma}(\alpha \; Afl \; - \; \rho \;) \ldots \qquad (12)$$

The specification in eq (12) shows that growth rate of output is a function of financial liberalization variables which positively affect the growth rate of output. Hence from the specification in Eq (12), we can rewrite the functional relationship between growth rate of output and financial liberalization as represented by the following equation.

$$\frac{\dot{Y}}{Y} = \text{f(fl)} \quad \textbf{……. (13)}$$

Chapter 5

Econometric Models, Estimation Methodology and Variables Description

Based on the theoretical linkage between financial liberalization and economic growth developed in the previous chapter, we are ready to study the impact of financial liberalization on economic growth in Pakistan. Since the growth regressions also encompass a number of other variables that affect it, so in addition to financial liberalization linkage with growth we also incorporate other growth control variables in our basic regressions. Our regression specifications thus resembles to the one used by Mattoo, *et al*., (2001).

In order to examine the overall impact of financial liberalization on growth along with a separate investigation of domestic as well as external components of financial liberalization and their relationship with growth, we thus split our regression specifications into three models. Section 5.1 covers in detail the econometric models to examine the impact of domestic financial liberalization, external financial liberalization and overall financial liberalization on economic growth. Section 5.2, however, describe the econometric methodology to examine these econometric models. The description regarding the dependent variable and control variables is discussed in section 5.3.

5.1: Econometric Models:

5.1.1 Model 1: Impact of Domestic Financial Liberalization on Economic Growth

Model 1 studies the impact of domestic financial liberalization on economic growth along with other determinants of growth. A theoretical model based on well established micro foundations is presented in the previous chapter. The model clearly shows the interaction of different agents like consumers, firms and banks (acting as an intermediary) in an economic system. It then illustrates the positive implications of liberalizing the financial sector of an economy on economic growth or output. Based on that theoretical

linkage between financial liberalization and economic growth and including other conventional determinants of growth, the relationship between growth, domestic liberalization of the financial services and other determinants of growth can be specified as

$$Y_t = b_o + b_1 fl_t + b_2 X_t + \varepsilon_t \ldots \qquad (5.1)$$

where Y_t the dependent variable is the Real GDP and is used as a proxy to represent economic growth , b_o is the constant term, fl_t is the composite index of domestic financial liberalization, X_t is the vector of growth control variables, and ε_t is an error term. In the above specified growth regression, vector of growth control variable (X_t) includes employed labor force, enrolment ratio, capital stock, and inflation rate. To estimate the relationship specified in Equation (5.1), the time series data covering the period (1972-2010) is used. The country was exposed to number of crisis during 1972-2010. On account of significance of these crises to the topic under consideration, that is financial liberalization, we include three important structural breaks in our data set. First structural break covers 1998 period that was the year when Pakistan conducted nuclear explosion and was exposed to economic sanctions. Similarly stock market crash of 2005 and 2008 global financial crisis were also important events in the context of financial sector. The detail of the dependent variable along with control variables is presented in section 5.3 on variable description in the same chapter. Here we explain the methodology regarding the construction of fl_t the composite index of domestic financial liberalization.

5.1.1.1 Domestic Financial Liberalization Index: No concrete measure of this variable is available in the literature and an accurate or precise measurement of this variable poses serious difficulties on account of diversity of financial services prevalent in the financial system of any economy. World wide or even in case of Pakistan, researchers use financial liberalization interchangeably to reflect financial development and they use the indicators of financial development to gauge financial liberalization. Both are entirely different concepts. Financial liberalization means the dismantling of barriers in a financial system, while financial development encompasses an improvement or growth in the

financial system. In cases where an exclusive measure of financial liberalization is used, it is of a binary nature (Bandiera *et al.,* 1999; Bekaert *et al.,* 2001). Those who have worked through generating a scale representing the liberalization of a regime have not come up with a single composite index for the measurement of domestic liberalization (Hermes and Lensink, 2005).

To our knowledge, not a single study in case of Pakistan exists, which has developed any concrete measure of domestic financial liberalization covering the important dimension of financial reforms employing any statistical technique. Financial liberalization is a dynamic process, rather than a one time event. A detailed, in depth investigation of all financial reforms, covering all important dimensions of domestic financial liberalization is very important. A single composite index capturing all these changes thus emerges as a concrete solution for the measurement of domestic financial liberalization.

In the light of this background, the next section develops a concrete measure of domestic financial liberalization for Pakistan. This measure covers all important dimensions of domestic financial reform process and employs the statistical tool of Principal Component Analysis (PCA) (Rencher, 2002). The index developed in the next section will then be used along with other determinants of growth to examine the relationship described in Equation (5.1).

5.1.1.2. Measurement/Construction of Domestic Financial Liberalization Index:

Domestic financial liberalization index used in Model 1 is constructed on the basis of information on seven main dimensions of financial reform program undertaken in Pakistan during the late 1980s. Following the method of Bandiera *et al*. (1999), the selection of seven different aspects of financial reforms have been made, while the data set has been constructed following the methodology of Abiad *et al*. (2008). The constructed data set on seven main dimensions of financial reforms is then utilized to construct a financial liberalization index through principal component analysis (PCA). In our data set, the seven main components of domestic financial liberalization include: interest rate regulation, credit controls, and reserve requirements, banking ownership, prudential regulation measures, pro-competitive measures and security market

development. The detail of these components and questions used to guide the coding to construct data set of domestic financial liberalization index is as follows.

i. **Interest Rate Regulation (INR):** This component of domestic financial liberalization includes direct interest rate control by the central bank or interest rate control through the use of floor, ceiling and interest rate bands. In the case of most restrictive regime, both lending and deposit rates are specified by the central bank, while interest rate fluctuates within a band in an intermediate regime. Contrary to these, a fully liberalized regime is the one in which all ceilings, floors or bands are abolished.

ii. **Credit Controls (CRD)**: Credit controls include directed credit toward favored or priority sectors like agriculture firms, selected manufacturing sectors etc., and even in some cases, credit is directed at subsidized rates. The information regarding this component is obtained by questioning the minimum amount of credit that must be channeled to certain sectors? Or there exist any ceiling on credit to other sectors? Or any kind of directed credit carrying subsidized rates exists?

iii. **Reserve Requirements (RSRV):** This includes excessive high reserve requirements which are even beyond the one needed under prudential regulations. A 20 percent threshold (following Abiad *et al*., (2008)) is used to determine the level of reserves (whether they are excessive or not)or how high reserve requirements are?

iv. **Banking Ownership (BNK)**: This dimension of financial liberalization studies the control of state –owned banks by looking at the share of banking sector assets. A decrease in the share of state owned-banks in total baking assets will represent a move toward liberalization and dominance of the private sector in the banking industry. Different levels of threshold such as 50 percent, 25 percent and 10 percent are used to assess the degree of high restriction or liberalization in the banking industry of Pakistan.

v. **Prudential Regulation Measures (PRD)**: This component of financial liberalization is different from other components as a greater degree of state control or intervention here is coded as reform. The information for this part of liberalization program is collected under the adoption of risk- based capital adequacy ratios (Basle capital accords, I and II), the autonomy of the Central Bank and adoption of CAMELS framework (for on-site and off-site surveillance of banks).

vi. **Pro-competitive Measures (PRCOM)**: Competition in the financial sector may be hindered on account of restriction imposed by the government on entry of new domestic banks, or other possible contestants such as foreign banks or non-bank financial intermediaries. This dimension of financial liberalization addresses these issues by considering entry of foreign banks, entry of new domestic banks, restriction on branching and other pro- competitive measures (such as specialized banking services, establishing universal banking, etc.).

vii. **Securities Market Development (SCR)**: This includes different policies of government to limit or promote the development of securities market like auctioning of government securities, establishment of debt and equity markets and opening of securities market to foreign investors.

Specific questions raised to collect information on the above seven dimensions of financial liberalization in order to perform the coding to construct data set of domestic financial liberalization index are listed in Appendix 2. Along each dimension, we assign a score on a scale showing liberalization of a regime from 0 to 4, with 0 showing complete restriction and 4 indicating fully liberalized. Between these extreme numbers, 1 refers to highly restricted, 2 represent moderately restricted, while 3 is for weakly restricted. The detailed construction procedures and assigning of different codes and calculation of the final score are described in Appendix 2.

The data set constructed according to these codes provides a much better measure of magnitude and timing of different actions taken during the process of financial liberalization. Identification of various policy changes/reforms on the basis of which scores

have been assigned have been made through a thorough investigation of financial reforms undertaken during the late 1980s till 2010. For this purpose, History of State Bank of Pakistan (1988-2003) by Asraf Janjua, Financial sector Assessment Report 1990-2000 of SBP, other SBP annual or quarterly reports, various economic surveys and other relevant material from different articles have been utilized. A detailed analysis of all these reform is presented in chapter 1 (Financial sector reforms in Pakistan).

For each policy variable, the data set constructed according to methodology employed in appendix 2 contains information under the relevant score. The data so generated for each variable are presented in Appendix 3, Table A1.

The scores reported in Appendix 3 Table A1 are employed to construct the domestic financial liberalization index for Pakistan. To construct a single index of domestic financial liberalization, we used the principal component analysis. This method is "*traditionally been used to reduce a large set of correlated variable into a smaller set of uncorrelated variables known as principal components*" (Stock and Watson, 2002 a, b). Through this method, a single index captures various dimensions of the financial reforms and extracts maximum information from the original data set. Employing principal component analysis, weight of each component of financial liberalization program is calculated. We can express the composition of domestic financial liberalization index in the following terms.

$$FL = w_1 INR + w_2 CRD + w_3 RSRV + w_4 BNK + w_5 PRD + w_6 SCR + w_7 PRCOM \quad (5.2)$$

Where w_i's represents the weight of each component given by respective eigen vector of the selected principal component. The eigen values and eigen vectors of correlation matrix of financial liberalization variables are given in Table 5. 1.

Table 5.1: Eigen values and Eigen vectors of correlation matrix of policy variables

Variable	Eigen Vector (λ_k)		
	λ_1	λ_2	λ_3
INR	0.392334	-0.011967	0.373115
CRD	0.374552	-0.395727	0.440485
RSRV	0.330712	0.782394	0.093545
BNK	0.378492	-0.113501	-0.800576
PRD	0.386727	0.311459	0.003759
SCR	0.386251	-0.306416	0.024976
PRCOM	0.392951	-0.165337	-0.128248
Eigen values(λ_k)	2.642019	0.100905	0.007056

Table 5.1 shows that first principal component capture almost 96 percent variation of the data set of seven policy variables [$\sum\lambda_k$=2.642019+0.100905+0.007056=2.74998, λ_1 =2.642019/2.74998=0.960741]. So we will substitute the eigen values (for $w_i s$) from the first principal component in equation (5.2)

FL = 0.39INT+0.37CRD+0.33RSRV+0.37BNK +0.38PRD +0.38SCR +0.39 PRCO … (5.3)

The value of the index for each policy variable /dimension of domestic financial liberalization is calculated by substituting the values of INR, CRD, RSRV, BNK, PRD, SCR, and PRCOM in Equ (5.3) from Table A1 in appendix 3 and then multiplied by the respective eigen value as shown in Equ (5.3). Final index for each year will be derived through adding up the calculated value of all seven main dimensions. The calculated values of individual and final index of domestic financial liberalization are presented in Table 5.2.

Table 5.2: Domestic financial liberalization index

Year	INR	CRD	RSRV	BNK	PRD	SCR	PRCOM	FL
1972	0	0	0.32	0	0	0	0.39	0.71
1973	0	0	0.32	0	0	0	0.39	0.71
1974	0	0	0.32	0	0	0	0.39	0.71
1975	0	0	0.32	0	0	0	0.39	0.71
1976	0	0	0.32	0	0	0	0.39	0.71
1977	0	0	0.32	0	0	0	0.39	0.71
1978	0	0	0.32	0	0	0	0.39	0.71
1979	0	0	0.32	0	0	0	0.39	0.71
1980	0	0	0.32	0	0	0	0.39	0.71
1981	0	0	0.32	0	0	0	0.39	0.71
1982	0	0	0.32	0	0	0	0.39	0.71
1983	0	0	0.32	0	0	0	0.39	0.71
1984	0	0	0.32	0	0	0	0.39	0.71
1985	0	0	0.32	0	0	0	0.39	0.71
1986	0	0	0.32	0	0	0	0.39	0.71
1987	0	0	0.32	0	0	0	0.39	0.71
1988	0	0	0.32	0	0	0.38	0.39	1.09
1989	0	0	0.32	0	0	0.38	0.39	1.09
1990	0	0	0.32	0	0	0.38	0.39	1.09
1991	0.39	0.74	0	0.37	0	0.76	0.78	3.04
1992	0.39	1.11	0	0.37	0	0.76	0.78	3.41
1993	0.39	1.11	0	0.37	0	0.76	0.78	3.41
1994	0.39	1.11	0	0.37	0.38	0.76	0.78	3.79
1995	1.17	1.48	0	0.37	0.38	1.14	1.17	5.71
1996	1.17	1.48	0.32	0.37	0.38	1.14	1.17	6.03
1997	1.17	1.48	0.96	0.37	1.14	1.14	1.17	7.43
1998	1.56	1.48	0.96	0.37	1.14	1.14	1.17	7.82
1999	1.56	1.48	0.96	0.37	1.14	1.14	1.17	7.82
2000	1.56	1.48	0.96	0.74	1.14	1.14	1.17	8.19
2001	1.56	1.48	0.96	0.74	1.14	1.14	1.17	8.19
2002	1.56	1.48	0.96	0.74	1.14	1.14	1.17	8.19
2003	1.56	1.48	0.96	0.74	1.14	1.14	1.56	8.58
2004	1.56	1.48	0.96	1.11	1.14	1.52	1.56	9.33
2005	1.56	1.48	0.96	1.11	1.14	1.52	1.56	9.33
2006	1.56	1.48	0.96	1.11	1.52	1.52	1.56	9.71
2007	1.56	1.48	0.96	1.11	1.52	1.52	1.56	9.71
2008	1.56	1.48	0.96	1.11	1.52	1.52	1.56	9.71
2009	1.56	1.48	0.96	1.11	1.52	1.52	1.56	9.71
2010	1.56	1.48	0.96	1.11	1.52	1.52	1.56	9.71

Financial liberalization index is also shown graphically in Fig 5.1.

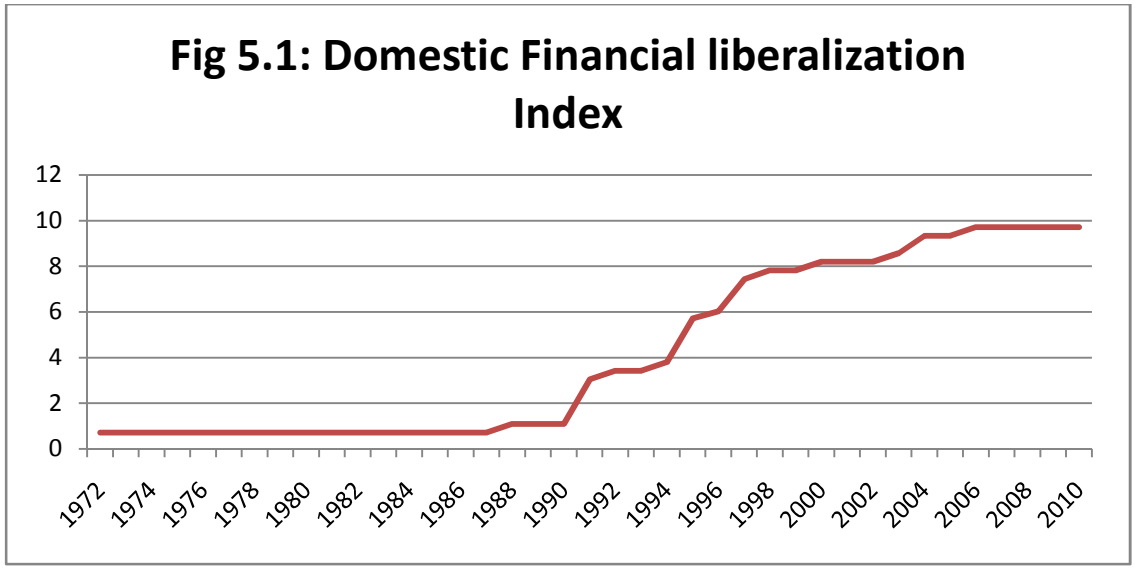


Fig 5.1 clearly shows the implementation of reforms starting from the late 1980s and a gradual upward movement of financial liberalization index thereafter. Before 1990, the index is represented by a straight line at very low values of liberalization index. That time period from (1972-1988) is characterized by controls and restrictive policies pursued by the government in the financial sector of Pakistan.

5.1.2. Model 2: Impact of External Financial Liberalization on Economic Growth

Model 2 studies the impact of external financial liberalization on economic growth along with other determinants of the economic growth. A liberalized economy not only in terms of domestic liberalization, but also in terms of external financial openness promotes economic growth through accumulation of capital brought through increased financial intermediation. Suggested by the neo-classical framework, and advocated by proponents of external financial liberalization, the openness of the external financial sector of economies will lead to an unhindered flow of capital from capital rich economies to capital scarce economies where the return on capital is usually high. This flow of capital complements the limited domestic savings in capital scarce economies. The resultant reduction in cost of capital allows for increased investment and hence economic growth.

(Kose et al, 2006). The theoretical argument in favor of external financial openness further suggest that external financial openness leads to higher economic growth through strengthening the domestic financial systems leading to more investment and more efficient allocation of capital. (Levine, 2001).

Based on the theoretical basis provided in the preceding paragraph, we study the impact of external financial liberalization on economic growth.

This model studies the impact of external financial liberalization on economic growth through two measures of external financial liberalization. The traditional approach to measure financial openness is through capital account openness, to look at legal restrictions on cross border capital flows. The IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER) provides significant information regarding this measure of financial openness and is used to construct binary measure (0/1 dummy variables) of capital account openness. "These *de Jure* measures are quality-based measures of financial liberalization, which concentrate on events such as changing regulations and the response of the monetary authorities to financial flows" (Ozdemir and Erbil (2008)).Utilizing the summary information provided in AREARS, some researchers construct the share measure which reflect the proportion of years in which a country was having an open capital account. (Grilli and Milesi-Ferretti, 1995; Rodrik, 1998; and Klein and Olivei, 2001). Narrative description in AREARS is used by Quinn (1997) to construct a quantitative measure of capital account openness.

However, *de jure* measures endure from certain shortcomings. They are not completely based on numerous limitations associated with foreign exchange transactions that may not hinder capital flows so they do not convey the degree of openness of capital account. These measures do not reflect the actual degree of integration of an economy into international capital markets. (Kose *et al.,* 2006).

On account of certain shortcomings related to *de Jure* measure, an alternative measure is the use of *de facto* approach (advocated, for example, in Prasad, Rogoff, Wei and Kose, 2003) of financial openness. The *de facto* measures can be used to study the actual result of the enforcement of existing regulation on financial markets. These *de facto*

measures basically show the actual integration of an economy with the international capital markets. The availability of *de facto* integration measures are based on the original work of Lane and Milesi- Ferretti, (2001). The *de facto* measures are calculated as sum of gross stock of foreign assets and liabilities as a ratio to GDP (Kose *et al.,* 2006).

To study the impact of external financial liberalization on economic growth, both measures of external financial liberalization are used. First, we study the impact of external financial liberalization on growth through *de Jure* measure.

5.1.2.1: Model 2a: Impact of External Financial Liberalization on Economic Growth through *De Jure* Measure:

The basic model remains the same as Model 1, however the only difference is the replacement of domestic financial liberalization index with the capital account liberalization through *de jure* measure. We replace "fl_t" index in Model (1) with *"cal_t "(capital account liberalization).* Dependent variable and other control variables will remain same. Thus the relationship between economic growth, external financial liberalization through *de jure* measure and other determinants of growth can be specified as

$$Y_t = b_o + b_1 cal_t + b_2 X_t + \varepsilon_t \ldots \qquad (5.4)$$

Thus, Equation (5.4) explains the financial liberalization through *de jure* measure.

i: Construction of *De Jure* Measure for Model 2a:

We mentioned in the preceding discussion regarding *de jure* measure that researchers use a variety of *de jur*e measures to measure capital account openness. However, in one way or other it just summarizes the information provided in AREARS and it's a binary (0/1) or quantitative measure. For the measurement of external financial liberalization through *de jure* measure for Model 2a, we constructed our own quantitative measure. Our measure resembles the one constructed by Quinn (1997), who has also developed a scale showing fully restricted capital account to a free capital account. Before

going into the discussion regarding the construction of scale of *de jure* measure, it is worth mentioning here the novelty and importance of the scale. The scale is novel in nature that no one has ever attempted to construct such a quantitative measure in case of Pakistan for the measurement of capital account openness. Beside that it is very informative and important on account of the fact that it captures the gradual development in the external financial sector of Pakistan under the most important dimensions of capital account liberalization.

The quantitative measure of capital account liberalization is based on a scale. Capital account transactions are scaled in terms of three dimensions of capital account openness namely exchange rate system, restrictions on capital inflow and restrictions on capital outflow. We assign a score on the scale showing liberalization of capital account from 0 to 5, with 0 showing complete restriction and 5 indicating fully liberalized. Between these extreme numbers, 1 refers to highly restricted, 2 represent moderately restricted, while 3 or 4 is for weakly restricted. The detailed construction of scale and coding for each year is presented in Appendix 4.

The data set constructed according to these codes provides a much better measure of magnitude and timing of different actions taken during capital account liberalization in Pakistan. Identification of various policy changes/reforms on the basis of which scores have been assigned have been made through a thorough investigation of financial reforms undertaken during the late 1980s till 2010 or any other relevant policy change before that period. For this purpose, various materials such as The *IMF's Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER), History of State Bank of Pakistan (1988-2003) by Asraf Janjua, Financial sector Assessment Report 1990-2000 of SBP, other SBP annual or quarterly reports, various economic surveys and other relevant material from different articles have been utilized. A detailed analysis of all these reforms is presented in chapter 3 (Financial sector reforms in Pakistan).

5.1.2.2: Model 2b: Impact of External Financial Liberalization on Economic Growth through *De facto* Measure:

It has already been mentioned in the start of Model 2 that we will examine the relationship between economic growth and external financial liberalization through two measures of external financial liberalization. External financial liberalization through *de jure* measure has been studied in Model 2a. Since *de jure* measures does not reflect the actual external financial openness of an economy on the basis of certain short comings (mentioned in the discussion in Model 2 about *de jure* measure) we move to *de facto* measure of external financial liberalization. The significance of *de facto* over *de jure* is also reported in the discussion in Model 2. On the basis of *de facto* measure's strength to measure actual integration of an economy in international financial markets, we now study the relationship between external financial liberalization and economic growth through the *de facto* measure.

With the introduction of this measure, Model (2a) now becomes

$$Y_t = b_o + b_1 fal_t + b_2 X_t + \varepsilon_t \ \ldots \qquad (5.5)$$

Model (2b) explains the external financial liberalization through *de facto* measure. All variables in Model 2b remains same as in Model 2a with the exception of "fal_t" which measures external financial liberalization through *de facto* measure.

i. Measurement of *De facto* Variable for Model 2b:

The *de facto* measure of external financial openness is measured as a sum of gross stock of foreign assets and liabilities as a ratio to GDP. "Sum of gross inflows and outflows are also proxied for international financial integration (IFI) because openness is defined both in terms of receiving foreign capital and in terms of domestic residents having the ability to diversify their investments abroad" (Edison *et al.*, 2002). However, flow data is often volatile and prone to measurement errors. Stock data, in contrast are less responsive to short run fluctuations linked with the factor that are unrelated to IFI and is a

refined cumulated version of underlying flows corrected for valuation effects. (Kose *et al.,* 2006).

The *de facto* measure of external financial openness that we use for the estimation of Model 2b is based on the work of Lane and Ferretti (2006). They have computed the accumulated stock of foreign assets and liabilities for a broad sample of 145 countries covering the period 1970-2004. An updated version of their data set till 2007 is also available on EWN data base. Their data set is exclusive and comprehensive in nature because it contains information on international financial position of countries. The composition of international financial position is distinguished on the basis of foreign direct investment, foreign portfolio investment, external debt (portfolio debt and other investments) and others (financial derivative and total reserves minus gold). For the estimation of Model 2b, we require data set up till 2010. Following the methodology of Lane and Ferretti (2006), we updated the data set for Pakistan.

ii. Methodology to update data set for Pakistan:

The series of FDI (both inflow and outflow) and others category has been updated using the international investment position data from IFS. While to update the foreign portfolio investment and debt series, we relied on the methodology adopted by Lane and Ferretti (2006). The methodology relies on indirect estimates which are constructed on the basis of cumulative flows with suitable valuation adjustments. The cumulative flow method is demonstrated as following.

$$D_t = \frac{p_t}{p_{t-1}} D_{t-1} + \frac{p_t}{p_t} d_t \quad \ldots \quad (5.6)$$

where,

D_t = stock of holding at the end of year "t"

d_t = flow of purchases during year "t"

p_t = U.S dollar price of "D" at the end of period "t"

$\overline{p_t}$ = average price of asset "D" during year "t"

This formula shows that end of period "t" holdings will be equal to cumulative holdings at the end of previous period, adjusted for valuation changes, and net buying throughout the period estimated at the end of period asset price.

Foreign Portfolio Investment Series:

We construct estimate of "*portfolio equity assets and liabilities by using cumulated portfolio equity outflows (for assets) and inflows (for liabilities) adjusted to take into account fluctuations in stock prices*" (Lane and Ferretti (2006).The price indices for domestic and international stock markets are taken into account for the measurement of these prices. To calculate asset category, we will use world stock price index, proxy by U.S stock price index. While, for the construction of estimates of liabilities, we employ Pakistan' stock price index. We have extended the foreign portfolio investment series up till 2010.To extend the series, we placed the stock data at the end of 2007, along with the flow data and US stock price index and Pak's stock price index data in the above formula

Debt Series:

The procedure to update the debt series is same as the one adopted to update foreign portfolio series with the exception that stock price index will be replaced with the exchange rate between the U.S dollar and Pak. Rs.

The series constructed by Lane and Ferretti uptill 2007 and updated by following their methodology till 2010 for Pakistan is presented in Appendix 5 Table A1. A summarized version of that table is reported in Table 5.1b and also presented graphically in Fig 5.1b. The gross stock of foreign assets and liabilities as a ratio to GDP is taken as measure of external financial liberalization. This is a *de facto* measure as it shows the actual integration of Pakistan's economy with the international financial markets; it is used

in Model 5.2b to estimate the relationship between external financial liberalization and economic growth.

Table 5.1b: Gross Stock of Foreign Assets and Liabilities

Year	Total assets (Million US $)	Total liabilities (Million US $)	sum of total assets and liabilities (Million US $)	Sum of total assets and liabilities (Million Rs.)	Gross stock of assets and liabilities as a ratio to GDP
1972	440.7	4273.7	4714.4	52004.7	1
1973	727.4	4847.8	5575.2	55194.3	0.8
1974	854.1	5426.8	6280.9	62181.3	0.7
1975	858.2	6100.3	6958.5	68889	0.6
1976	985	7173	8158	80764.3	0.6
1977	1000.7	7950.3	8951	88614.8	0.6
1978	935.3	8735.8	9671.1	95743.8	0.5
1979	845.6	9369	10214.6	101124.9	0.5
1980	1140.6	10459.2	11599.8	114838	0.5
1981	1366.2	11224.1	12590.3	124643.5	0.4
1982	1638.6	12263.8	13902.4	178506.9	0.6
1983	2665.7	12614.5	15280.2	206282.1	0.6
1984	1860.2	12806	14666.2	225272.4	0.5
1985	1731.4	14179.7	15911.1	254259.9	0.5
1986	1855.8	15754.6	17610.4	303779.8	0.6
1987	1862.3	17759.9	19622.2	342407	0.6
1988	1975.4	18219.7	20195.2	376639.8	0.6
1989	2296.8	19582.8	21879.5	468659.9	0.6
1990	2457.4	22206.6	24664	540141.5	0.6
1991	2987	25281.7	28268.7	698802.1	0.7
1992	3893.8	27394.1	31287.9	804098.4	0.7
1993	4518.4	27845.9	32364.3	974812.6	0.7
1994	6560.8	32336.3	38897.1	1198030.6	0.8
1995	5575.4	35009.3	40584.6	1390024	0.7
1996	4579.9	35240.2	39820.1	1597582.8	0.8
1997	5303.5	36711.7	42015.2	1850768.9	0.8

Continued…

1998	5221.7	38250.1	43471.7	1994713	0.7
1999	6423.5	40228.2	46651.7	2415840.3	0.8
2000	6895.8	38823.7	45719.5	2653066.6	0.7
2001	9018.2	37396.4	46414.6	2824969.1	0.7
2002	13561.7	41210	54771.7	3206003.7	0.7
2003	16962.8	45687.3	62650.1	3584526.6	0.7
2004	17275.1	46766	64041.1	3786364	0.7
2005	17777.1	49699.7	67476.7	4037126.7	0.6
2006	19757.7	57933.3	77691	4732792.9	0.6
2007	22403.1	77063.9	99467	6089439	0.7
2008	17020.8	93276.7	110297.5	8724315.2	0.9
2009	22504.3	97118.5	119622.7	10079819.5	0.8
2010	25100.2	94682.3	119782.5	10266654.6	0.7

Source: Lane and Ferretti uptill 2007, Author's calculation for 2008-2010

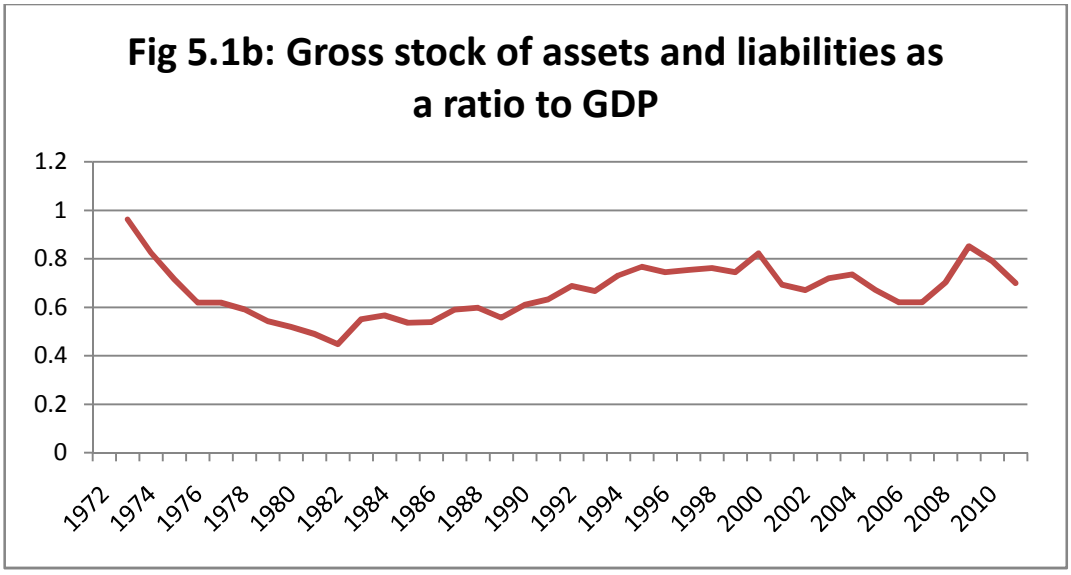


Table 5.1b along with the Fig 5.1b present the evolution of sum of gross stock of foreign assets and liabilities as a ratio to GDP from 1972 till 2010. It is clear from the Fig that this ratio has not recorded a significant improvement after the reforms introduced in the external financial sector of Pakistan. In fact, the ratio is stagnant between 0.7 to 0.9 % between 1992 and 2010. This implies that despite several reforms introduced in the

external financial sector of Pakistan, the international financial integration of Pakistan has been limited.

5.1.3: Model 3: Impact of Financial Liberalization on Economic Growth

In the literature, some researchers have just focused on examining the impact of domestic part of liberalization of financial sector on economic growth, while others solely focused on the impact of external financial liberalization on economic growth. No one has ever attempted to examine the separate impacts of domestic and external measures of financial liberalization and then a joint impact through the inclusion of domestic and external variable in a single regression. The financial liberalization index constructed on the basis of information on seven main items following Bandiera *et al.,* (1999) captures only the domestic component of financial liberalization. To get a broader picture of the overall financial liberalization that should include the external side also, we extended the model by incorporating the external-side variables used in Models (2a) and (2b). In order to evaluate the overall impact of financial liberalization on growth, we include both the domestic and external financial liberalization measures in a single regression. With the inclusion of all these variables, our growth specification now becomes

$$Y_t = b_o + b_1 fl_t + b_2 fal_t + b_3 X_t + \varepsilon_t \quad \ldots \quad (5.7)$$

All the variables in Model (3) are same as in Model (1) except "fal_t" which measures the external financial liberalization through a *de facto* approach and is measured as gross sum of foreign assets and liabilities as a ratio to GDP. Model (3) thus determines the relationship between economic growth and financial liberalization through both domestic and external components of financial liberalization.

5.2- Econometric Methodology:

The empirical testing of Model 1, Model 2a, Model 2b and Model 3 will be carried out according to the following steps.

5.2.1: Unit Root Testing

5.2.2:. Johenson and Juselius Co-integration Test

5.2.3: Vector Error Correction Mechanism(VECM)

5.2.1. Unit Root Testing:

Before applying any econometric technique on the equations specified in model 1, model 2a, model 2b and model 3, we examine the time series properties of the data. The starting point for the examination of time series properties of any data is to check for the presence of unit root or stationarity/non-stationarity in the data[5]. We apply unit root on the logarithm of variables because log variables gives us elasticities and reduce the impact of outliers and smoothes out the timer series (Maddala, 1992). To check the presence of unit root, we employ Augmented Dickey-Fuller (1979 and1981) test.

Augmented Dickey-Fuller (ADF) test takes the following regression form:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \sum_{i=1}^{m} \delta \Delta y_{t-i} + \varepsilon_t \qquad \ldots \qquad (5.8)$$

where, y_t is any time series to be tested for the unit root, "t" is time trend, and "ε_t" is white noise error term. In Equ (5.8), we test the null hypothesis of non stationarity ($\gamma = 0$) against the alternative hypothesis of stationarity($\gamma \neq 0$) with the help of ADF test statistics. Rejection of null hypothesis implies that a series is stationary at level or integrated of order zero i.e., I(0).The test statistics used for the significance of coefficients is Mckinnon τ- values. However, if the series is non- stationary, we can take the first

[5] "*A series is said to be stationary if it exhibits mean reversion, i.e., it fluctuates around a long-run equilibrium value, has constant, finite and time invariant variance and has a correlogram that diminishes as lag length increases*" [enders, 1995].

difference of the series to make it stationary and that kind of series will be called I (1). Even if the first difference cannot make a series stationary we can proceed further by taking the second difference and so on until the series become stationary.

5.2. 2. Johenson and Juselius Co-integration Test:

After examining the time series properties of the variables through unit root test, the next step is to detect the long run relationship between the variables under study. We employ Johenson Co-integration analysis to examine the long-run relationship between variables in Model 1, Model 2a, Model 2b and Model 3.

The theory of co-integration which assumes that even though individually two series are non-stationary but their linear combination can be stationary. It implies that there is really a relationship linking the two variables together and thus co-integration becomes a powerful tool for detecting the presence of economic structures.[6] The concept of co-integration was introduced by Granger (1981) and elaborated by Engle and Granger (1987) and it combines short run dynamics with the long run equilibrium. However, since our model is multivariate, we use the test procedure suggested by Johenson (1988) and Johenson and Juselius (1990).

Following Johenson (1988) and Johenson and Juselius (1990), the co-integrating equation or Vector Error Correction Model (VECM) can be represented as,

$$\Delta Z_t = \mu + \theta D_t + \sum_{i=1}^{k-1} \Gamma_i \Delta Z_{t-i} + \Pi Z_{t-1} + \varepsilon_t \qquad \ldots \quad (5.9)$$

where μ is the deterministic component and represents intercept (no trend) in both CE and VAR (Vector Auto Regressive) and θD_t represents vector of structural breaks. The Π matrix is the long-run co-integrating matrix and it contains the information regarding the long run relationships. It contains all the relevant information regarding the

[6] The basic idea behind the co-integration theory runs from the spurious regressions as results from regressions with non-stationary variables can be spurious and misleading; taking the difference of the variables can lead to loss of long run information. So these issues can be addressed by integrating short run dynamics with long run co-integrating vector.

number of co-integrating relationships among the variables. The Π matrix can be decomposed into $\Pi = \alpha\beta'$ where β' is the long run matrix of co-efficient, while α represents the speed of adjustment toward state of equilibrium and it contains the equilibrium error correction term. The expected sign of the error correction coefficient is negative. The error correction term has a negative sign. The term Γ shows the coefficients of VAR or the short run coefficients explaining the short run relationships between the variables of the model.

In equation (5.9), *k* indicates the optimal lag length of VAR model. There are different selection procedures for determination of lag length such as Akaike Information Criteria (AIC), Schwarz Information Criterion (SIC), Hannan-Quinn Information Criterion (HQ). The selected lag length indicates that the residuals of VAR model are white noise.

The existence of co-integration relationship depends on the rank of the matrix Π. To examine the rank of the matrix Π, or in other words to examine the co-integration relationship between variables of model 1, model 2a, model 2b and model 3, multivariate co-integration analysis is conducted under two likelihood ratio tests provided by Johenson (1988) and Johenson and Juselius (1990). Among these two likelihood ratio tests, one is trace test, which assumes at most r ($0 \leq r \leq n$) co-integrating vectors against the alternative of "n-r" co-integrating vectors. Here the null hypothesis of

Ho (r) = rank(Π) ≤ r

is tested against the alternative of

Ha (r) = rank(Π) = n-r

The second test statistics is the maximum eigen value, which tests the presence of r co-integrating vectors against the alternative of r+1 co-integrating vectors. In this case the null hypothesis is set as

Ho (r) = rank(Π) = r

against the alternative of

Ha (r) = rank(Π) = r+1

5.2.3. Vector Error Correction Mechanism (VECM):

If the variables of the models under study are co integrated, we will move to Vector Error Correction Mechanism (VECM) to analyze the short run dynamics of the model. The long run coefficients obtained under co-integration analysis allow us to deduce the error correction term. The error correction term consist of residuals from the long run economic growth function. To obtain the short run dynamics of model, we start with general error correction mechanism (ECM) representing the short run coefficients of the model and an error correction term representing the speed of adjustment toward equilibrium if the system deviates from its equilibrium position. The parsimonious short run dynamic error correction model is obtained by following Hendry's general to specific approach.

Finally, to determine the appropriateness of the model, certain diagnostic tests such as serial correlation, normality, heteroskedasticity and Ramsey tests will be conducted while the stability test will be performed using CUSUMQ square tests.

5.3: Variables Description

To estimate the relationship specified in Model 1, Model 2a, Model 2b and Model 3, the dependent variable and control variables remain the same and we use time series data covering the period (1972-2010). Description of dependent variable and control variables along with their data source is given in the following:

1. **Real GDP**: Real GDP is the dependent variable. Real GDP is obtained by dividing nominal GDP by GDP deflator at 2000 base. The source is International Financial Statistics.

2. **Employed Labor Force**: Data for employed labor force include the actual employed working force. This series has been obtained from Pakistan Economic Survey, Various issues.

3. **Enrolment Ratio**: we divide the sum of primary, middle, high stage and arts and science college enrolments with the sum of respective age groups. Data for the construction of this series has been taken from the Pakistan Economic Survey (various issues).

4. **Inflation Rate**: Inflation rate series has been constructed on the basis of CPI at constant prices of 1999-2000. The source of data is again International Financial Statistics.

5. **Capital Stock Series:** Actual capital stock data are not available from the secondary sources; a common practice is to use gross fixed capital formation as a proxy for capital stock. However, we have constructed the actual series for capital stock utilizing the information on gross fixed capital formation. The capital stock series is computed using the following formula

$$K_t = K_{t-1} (1-d) + I_t$$

where,

K_t = capital stock in year *t*

K_{t-1} = capital stock in year *t-1*

I_t = Gross fixed capital formation in year t

d= depreciation rate

To get an initial estimate of capital stock, we followed Burney (1986), who has used Khalijji (1982) to derive the capital–output ratio for 1959-60. This capital output ratio was 2.75 in 1959-60. The depreciation rate was also from Khaliji's aggregate capital stock series and it was taken as 4 percent. Utilizing this information, and putting the values in the above formula, we have subsequently generated a full series of capital stock from 1960 till 2010. For the purpose of our study, series from 1972-2010 is then utilized. The data on gross fixed capital formation I_t is taken from the Handbook of Statistics on Pakistan's Economy, SBP.

Chapter 6: Empirical Results

This chapter reports the results of model 1, model 2a, model 2b and model 3 in the light of econometric methodology explained in chapter 5, section 5.2.

6.1: Empirical Results of Model 1:

We present the econometric result of model 1 (impact of domestic financial liberalization on economic growth) in this section.

6.1.1: Unit Root Testing:

ADF test is applied on all the variables employed in Model 1 to detect the presence of unit root. Table 6.1 reports the unit root test for all the variables employed in Model 1. With the exception of inflation rate which is stationary even at level, all other variables are integrated of order 1.

Table 6.1: Unit Root testing by ADF test statistics for Model 1[7]

Series	Specification	Level	Ist difference	Decision
Real GDP	Intercept	-2.61(0)	-4.47(0)*	I(1)
Domestic financial index	Intercept	-0.28(0)	-5.80(0)*	I(1)
Employed labor force	Intercept and trend	-1.40(0)	-6.88(0)*	I(1)
Capital Stock	Intercept	-2.49(1)	-3.47(0)**	I(1)
Enrolment ratio	Intercept	-1.35(0)	-6.38(0)*	I(1)
Inflation rate	Intercept	-4.36(9)*		I(0)

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level
Note: number in parenthesis indicate number of lags.

6.1.2: Multivariate Co integration Analysis:

Given the non-stationary nature of all series of Model 1, which are all integrated of same order I(1), except inflation rate which is I(0), we employ Johenson Co-integration

[7] The specifications with only intercept for all series except LELF are reported because trend appears to be significant in LELF series.

analysis to examine the long-run relationship between economic growth, domestic financial liberalization index and other conventional determinants of growth.

However, before conducting Johenson con-integration tests, we select the appropriate lag length of the model. There are different selection procedures for determination of lag length such as Akaike Information Criteria (AIC), Schwarz Information Criterion (SIC), Hannan-Quinn Information Criterion (HQ), etc; however, we base our model on the lag length selected according to AIC criterion. AIC is minimum at 2 lags with structural breaks of 1998, 2005 and 2008. The results of different lag length selection processes are reported in Table 6.2, according to which AIC is minimum at 2 lags, so we test our model for co-integration up to 2 lags**.** Besides this selection procedure, given the size of our sample, lag length of 2 is suitable for our model testing.

Table 6.2: Lag length according to different Criterion for Model 1

Lag	LogL	LR	FPE	AIC	SC	HQ
0	77.29434	NA	3.12E-08	-3.096991	-2.226225	-2.790005
1	327.5012	378.6914	1.69E-13	-15.27033	-13.31111*	-14.57962
2	371.1459	54.26099*	7.15e-14*	-16.27816*	-13.23047	-15.20371*

* 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, and HQ: Hannan-Quinn information criterion.

After the selection of appropriate lag length of the model, we now investigate the co-integration relationship between the variables of model 1 using maximum eigen value test and trace tests. In both these tests, if the calculated statistics is greater than critical value, we reject the null hypothesis. Thus the first row tests

Ho: $r = 0$ against H1: $r = 1$

If this Ho is rejected only, then we proceed to next row and so on. Johenson co-integration test results are presented in Tables 6.3 and 6.4 respectively

Table 6.3: Result of Trace Test for Model 1

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
r = 0	r ≥ 1	0.730897	84.40301282	69.81889
r = 1	r ≥ 2	0.575532	49.26413667	47.85613
r = 2	r ≥ 3	0.559266	26.32509205	29.79707
r = 3	r ≥ 4	0.137966	4.392716256	15.49471
r = 4	r ≥ 5	0.015514	0.418553282	3.841466

Trace test after adjusting the degrees of freedom indicates two co integrating eqn(s) at the 0.05 level

Table 6.4: Result of Maximum Eigen Value Test for Model 1

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
r = 0	r ≥ 1	0.730897	35.13889846	33.87687
r = 1	r ≥ 2	0.575532	22.93904462	27.58434
r = 2	r ≥ 3	0.559266	21.93237282	21.13162
r = 3	r ≥ 4	0.137966	3.974162974	14.2646
r = 4	r ≥ 5	0.015514	0.418553282	3.841466

Max Eigen Value test after adjusting the degrees of freedom indicates one co integrating eqn(s) at the 0.05 level

The likelihood ratio statistics from trace test indicates the presence of two co-integrating vector at 5 percent level of significance after adjusting the degrees of freedom. Following Qayyum (2005), we retain only the first co-integrating vector which is associated with the highest/max eigen value. However, maximum eigen value test after adjusting the degrees of freedom indicates 1 co integrating eqn(s) at the 0.05 level. The likelihood ratio statistics from both tests indicate the presence of one co-integrating vector at 5 percent level of significance after adjusting the degrees of freedom[8]. The result of

[8]Since our sample size is relatively small for examining a long run relationship under co-integration, so we follow Reinsel and Ahn (1988,1992) method to adjust degrees of freedom by factor T-KL/T. Where, T shows the number of observations and K represents number of variables and L is for the selected lag length of the model. The value coming out of this formula is multiplied with the trace and eigen value statistics and then compared with the critical value.

these tests shows the existence of long run relationship between domestic financial liberalization and economic growth. The empirical result suggests that there exists a unique long-run relationship among economic growth, domestic financial liberalization and other determinants of growth. The long run normalized co-efficient of the estimated co-integrated vector are reported in Table 6.5.

Table 6.5: Normalized Co-efficient of Co integrating Vectors on LRGDP for Model 1

Variable	Co-efficient	Standard Error	t-Value
LFL	0.071991**	-0.03518	2.04636157
LKS	1.196101*	-0.13164	9.086151626
LELF	-0.325507	-0.2903	-1.121277988
LENRR	-0.79598*	-0.15339	-5.189256144

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

The results of the co-integration analysis (Table 6.5) indicate that the estimated long run coefficient of log of domestic financial liberalization index (LFL) is 0.07, which shows that domestic financial liberalization positively affects economic growth in the long run. Although size of the coefficient is not very large it implies that a 1 percent increase in domestic financial liberalization can lead only to a 0.07 percent increase in economic growth. Despite smallness of the coefficient, the result is still quite meaningful in conveying a clear message that domestic reforms undertaken in Pakistan during the late 1980s onward have contributed positively to economic growth of Pakistan. It also indicates the importance of financial intermediation and financial deepening, which have occurred on account of financial liberalization. Removing the interest rate ceiling, abolishing the directed and controlled credit programs, developing the security markets, strengthening the Central Bank and giving it more autonomy are among the key factors that have contributed toward developing a more stable financial system. Domestic financial liberalization brought through domestic reforms positively contributed to economic growth because measures undertaken to strengthen the financial system (see Chapter 3) and a move towards a more market-based mechanism have indeed made the financial sector more supple and resilient and has increased financial intermediation and deepening, which have contributed positively to economic growth.

It may also be noted that the financial liberalization has accelerated financial development thus raising the capability of financial intermediaries to provide resources, which have helped in enhancing investment and growth in the country. To get an overview of how the financial liberalization has actually promoted financial development in Pakistan, some important financial development indicators are presented in Table 6.6.

Table 6.6: Indicators of Financial Development

Year	M2/GDP	Private sector credit/GDP	Stock market capitalization/GDP
1971-80	33.9	19.24	4.08
1981-90	34.02	21.45	3.75
1990	32.27	19.92	4.68
2000	38.59	22.33	10.24
2001	39.64	22.02	8.15
2002	43.8	21.92	9.26
2003	46.99	24.87	15.48
2004	49.36	29.3	24.05
2005	48.61	28.44	30.95
2006	44.69	27.73	36.75
2007	46.87	28.59	46.34
2008	45.78	28.20	36.88
2009	40.33	22.82	16.65
2010	39.39	20.59	18.63

Source: Khan and Qayuum (2007) and SBP Statistical Bulletin (various issues).

Table 6.6 shows an improvement in all major indicators of the financial development. Our findings lent support to Mc-Kinnon and Shaws (1973) financial liberalization thesis which states that financial liberalization enhances economic growth through an increase in investment and productivity. Our findings also get support from already existing literature regarding financial liberalization, financial development and growth in case of Pakistan.[9] Majority of the studies evaluating this relationship in Pakistan have come up with a positive relationship. However, international literature on the impact of financial liberalization on growth provides mixed evidence. So our results are in line

[9]Our results are also consistent with Hasan, Khan and Ali (1996), Khan and Hasan (1998), Mohammad (2010), Khan and Qayyum (2006), Hermes and Lensink (2005) and Mattoo, Rathindran and Subramanian (2001) etc.

with both the international and Pakistani literature, which depicts a positive impact of domestic financial liberalization on economic growth.

Among other determinants of growth, the estimated long run coefficient of capital stock positively and significantly impacts the economic growth in the long run. The estimated coefficient for this variable is 1.19 which implies that a 1 percent increase in capital stock increases economic growth by 1.19 percent. This strong and significant impact of capital stock on economic growth of Pakistan highlights the importance of this primary factor of production in output generation or economic development of the economy. These results are consistent with the existing economic growth theories in the literature [such as Cobb-Douglas Production function and Solow Growth Model]. These findings are also in line with empirical studies; including, Siddiqui (2004), Burney (1986), Ahmed (1994), IMF (2005), and Das and Paul (2011). Overall the emergence of capital as an important contributor to growth in these studies is on account of significant increase in the investment ratio or growth in total and fixed investment rates.

Employed labor force on the other hand, negatively affects economic growth in the long run in above estimated model. However, this negative impact is insignificant, which reflects the irrelevance of this variable in the long run growth of the country. The reason for this negative and insignificant result can be attributed to low productivity of our work force. An educated, skillful labor force, which should constitute a bulk of human capital necessary to promote growth in the country in fact lacks in case of Pakistan. There is a dearth of qualified human resource like engineers, qualified technicians, agriculturists, etc., who can participate in the economy to uplift its status and move it toward the roads to progress. The insignificant result regarding this variable resembles the result found by Das and Paul (2011), while the negative impact of labor force on economic growth is in line with Banam (2010).

Enrolment ratio used as a proxy for human capital negatively and significantly impacts the economic growth in the long run with a coefficient of 0.79. This result is contradictory to majority of the studies exploring the relationship between human capital and economic growth in case of Pakistan or even internationally. However, the negative

impact of human capital on growth is in line with Pakistani literature of Awan *et al*., (2011) and international studies like Spiegel (1994), Lan *et al*., (1991), Dasgupta and Weale (1992), and Pritchett (2001). The negative impact of human capital on growth is attributed to a highly fragmented education system in Pakistan coupled with issues of access, quality and governance. Secondly, there is a mismatch between the jobs demanded by the emerging requirements of the economy and the provision of qualified, trained and skilled manpower. An increase in human capital of the country as represented by an increase in enrolment ratios may also reflect an increase in the supply of educated labor force; however, the sluggish demand for it may decrease the return to education. The sluggish demand can be on account of limited adoption of innovation. Another important factor is not a mere increase in quantity of education, but attainment of cognitive skills according to the growing needs of the economy or quality of education is rather important in promotion of growth through human capital. (Hanushek and Woessmann, 2007; Hanushek and Kimko, 2000)

6.1.3: Vector Error Correction Model (VECM):

After discussing the results under co-integration for long run relationships, now we present the results obtained under the error correction model showing the short run relationship between variables along with error correction term. The parsimonious dynamic error correction model showing the short run dynamics is presented below and reported in Table 6.7.

$$\Delta LRGDP_t = c_o + c_2\Delta LRGDP_{t-2} + c_4\Delta LFI_{t-1} + c_5\Delta LFI_{t-2} + c_6\Delta LKS_t + c_7\Delta LKS_{t-1} + c_{10}\Delta LELF_{t-1}$$
$$+ c_{12}\Delta LENRR_t + c_{18}DUM1998_t + c_{19}DUM2008_t + c_{20}EC_{t-1} \quad \ldots\ldots \quad (6.1)$$

Table 6.7: Short Run Co-efficient along with Error Correction Term for Model 1

Variable	Co-efficient	Standard Error	t-Value
C	0.023589**	0.010585	2.228462
D(LRGDP(-2))	0.318674**	0.137172	2.323168
D(LFL(-1))	0.025648***	0.01408	1.821556
D(LFL(-2))	-0.043965*	0.010993	-3.999247
D(LK)	0.105488*	0.032145	3.281597
D(LK(-1))	-0.079635**	0.034053	-2.338568
D(LELF(-1))	0.30065**	0.123249	2.439366
D(LENRR)	-0.076511**	0.032513	-2.353268
DUM1998	-0.071056*	0.022663	-3.13536
DUM2008	-0.034531**	0.01264	-2.731935
EC(-1)	-0.497317**	0.239146	-2.079558

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

Results under short run error correction model show that the overall impact of domestic liberalization on economic growth is negative in the short run. These results are not consistent with the positive impact derived in the long run estimation of model 1. This shows that liberalization has contributed to economic growth positively in the long run but their effect in short run is proved to be detrimental. The reason for the negative effect can be attributed to the long run nature of liberalization policies, as to reap the benefits of any policy change, a short period of one or two years is not enough. Rather a policy needs a reasonable period of 5 years or more than 5 years to translate its impact on real variables in any economic system. Another important point to be noticed here is that domestic financial liberalization was not a one time policy action, but it was an ongoing process starting from the late 1980s, gradually moving the financial sector to a more market-based mechanism and undertaking several other reforms whose impact to study in short run is a mere false exercise.

Economic growth is positively and significantly affected by its own lag which shows that economic growth with 2 periods lag positively contribute to current economic growth in the short run.

The overall impact of capital stock on economic growth also emerge out be positive in the short run. This result is again consistent with the positive contribution of capital in economic growth in the long run estimation of model 1. The positive contribution of capital stock towards economic growth is also in line with the economic theory and it highlights the importance of the capital stock as a major contributor to economic growth even in the short run. Employed labor force with one period lag positively affects economic growth in the short run. This result shows the importance of employed labor force as a significant contributor in short run which means that employed labor force used as an input in production enhances the economic growth in short run. In case of Pakistan this input positively contributes to economic growth in short run because Pakistan is a labor abundant country and still more than 40 percent of employed labor force is engaged in agriculture and agriculture also constitute bulk of our total output. However, for long run not only a mere increase in number of work force but an increase in quality of labor as well as an increase in the absorption capacity of the economy is necessary to generate a positive impact of employed labor fore on economic growth. Enrolment ratio, however, still appears to influence negatively the economic growth in the short run.

The dummy for 1998 appears to be highly significant (at 1 % significance level) in the short run with a negative impact on economic growth. This implies that the nuclear explosion conducted in 1998 and the resultant sanctions applied on Pakistan have in fact negatively influenced the economic growth in the short run. The dummy for 2008 also negatively affects the economic growth but at 5 % level of significance. Although the 2008 dummy (global financial crisis) is less significant in terms of level and magnitude as compared to 1998 dummy, however still its significance at 5 % shows that the global financial crisis have hurt the economic growth in short run but with small magnitude as compared to 1998 economic sanctions.

Finally, the error correction term reported in Table 6.7 shows the speed of adjustment, which comes out to be -0.49 and is significant at 5 percent level of significance**.** The negative sign of error correction term clearly shows that if the system deviates from its equilibrium position (i.e., the long run path), it converges back to equilibrium with an

adjustment speed of 0.49. In other words, it also conveys the message that the previous period disequilibrium is corrected with an adjustment speed of 49 percent.

Finally, to determine the appropriateness of the model, certain diagnostic and stability tests are also conducted. Diagnostic tests such as serial correlation, normality, heteroskedasticity and Ramsey tests are reported in Table 6.8, while the result of the stability test is presented in Figure 6.1 .

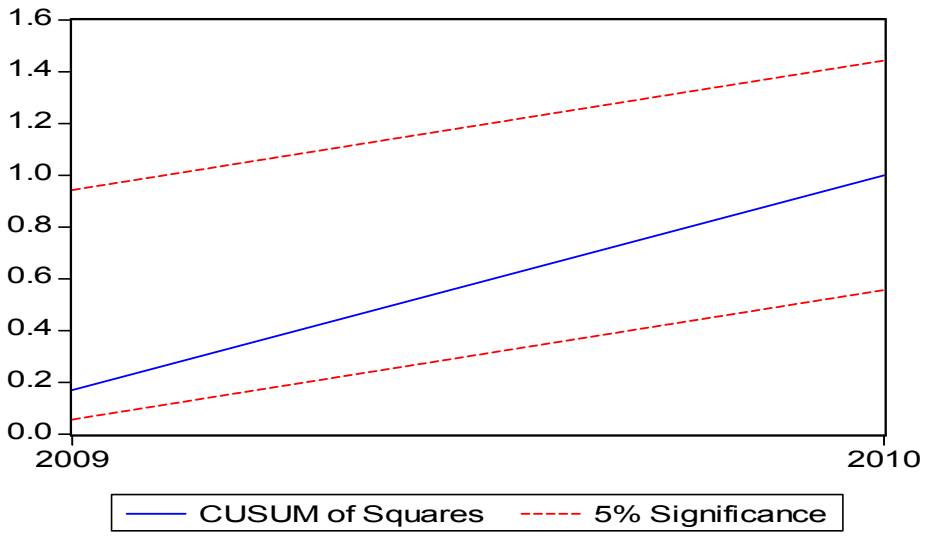
Table 6.8: Diagnostic Test Result for Model 1

Serial Correlation LM-Test	
Obs*R-squared	4.973(0.08)
ARCH Test:	
Obs*R-squared	0.213(0.64)
Normality Test	
Jarque Bera	0.159(0.92)
Ramsey Reset Test	
F-Statistic	0.012(0.91)

Note: Values in parenthesis are the respective probabilities.

Plot of CUSUMQ (Stability Test)

Fig 6.1: Plot of Cumulative Sum of Squares of Recursive Residuals for Model 1



The results of diagnostic tests show that the selected model is best fitted and parsimonious on account of the fact that it does not suffer from any kind of serial correlation, or heteroskedasticity problem and functional form of the model is correct. While the figure for stability test show that plot of CUSUMQ statistics lies within the critical bounds, implying that all the co-efficient in the estimated model are stable.

6.2: Empirical Result of Model 2:

Impact of external financial liberalization on economic growth is measured through *de jure* and *de facto* measures of external financial openness. We separately discuss the result of both these measures.

6.2a: Empirical Result of Model 2a:

First, we discuss the econometric results obtained for *de jure* measure of external financial openness.

6.2.1a: Unit Root Testing:

We start with the first step of determining the order of integration of variables used in Model 2a. The unit root testing by ADF test statistics for Model 2a is reported in Table 6.2 a.

Table 6.2a: Unit Root testing by ADF test statistics for Model 2a[10]

Series	Specification	Level	Ist difference	Decision
Real GDP	Intercept	-2.61(0)	-4.47(0)*	I(1)
Capital account liberalization (*de Jure*)	Intercept	-0.63(0)	-4.79(0)*	I(1)
Employed labor force	Intercept and trend	-1.40(0)	-6.88(0)*	I(1)
Capital Stock	Intercept	-2.49(1)	-3.47(0)**	I(1)
Enrolment ratio	Intercept	-1.35(0)*	-6.38(0)*	I(1)
Inflation rate	Intercept	-4.36(9)*		I(0)

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level
Note: number in parenthesis indicate number of lags

[10] The specifications with only intercept for all series except LELF are reported because trend appears to be significant in LELF series.

All the variables used in model 2a are same as in model 1 with the exception of "*cal*" which is Capital account liberalization. This "*cal"* a *de jure* measure of external financial openness is also integrated of order 1, i.e., I(1).

6.2.2a: Multivariate Co integration Analysis:

The econometric technique used to study the relationship specified in Model 2a is same as the one employed for the estimation of Model 1 (domestic financial liberalization model). The selected technique of co-integration suggested by Johenson (1988) and Johenson and Juselius (1990) best serves the estimation requirements of Model 2a on account of the fact that *de jure* variable represented by *"cal* $_t$ *"* is also integrated of order 1, i.e., I(1) and it is used with other variables of I(1) order of integration in the long run. While the only exception is inflation which is I(0) and it will enter in the short run model in the similar fashion as it entered in Model 1.

Next step is the determination of the appropriate lag length for the estimation of Model 2a and then we report the results from the Johenson co-integration test (both the trace test and eigen value test).

Like Model 1, we also base the empirical estimation of Model 2a on the lag length selected according to AIC criterion. AIC is minimum at 2 lags with structural breaks of 1998, 2005 and 2008. AIC is minimum at 2 lags and given the size of our sample, lag length of 2 is appropriate for our model testing. The results of different lag length selection processes are reported in Table 6.3a, according to which AIC is minimum at 2 lags, so we test our model for co-integration up to 2 lags**.**

Table 6.3a: Lag Length according to different Criterion for Model 2a

Lag	LogL	LR	FPE	AIC	SC	HQ
0	62.41642	NA	6.98E-08	-2.292779	-1.422013	-1.985793
1	292.8508	348.7656	1.10E-12	-13.39734	-11.43812	-12.70662
2	344.8576	64.65705*	2.96e-13*	-14.85717*	-11.80948*	-13.78272*

* 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, and HQ: Hannan-Quinn information criterion.

After selecting the appropriate lag length of the model, we now investigate the co-integration relationship between the variables of Model 2a using maximum eigen value and trace tests. In both of these tests, if the calculated statistics is greater than critical value, we reject the null hypothesis. Thus the first row tests

Ho: $r = 0$ against H1: $r = 1$

If this Ho is rejected only, then the next row is considered, and so on. The results from the Johenson co-integration test are presented in Tables 6.4a and 6.5a respectively.

Table 6.4a: Result of Trace Test for Model 2a

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
$r = 0$	$r \geq 1$	0.791335	91.57508462	69.81889
$r = 1$	$r \geq 2$	0.541426	49.62694897	47.85613
$r = 2$	$r \geq 3$	0.456328	28.75674949	29.79707
$r = 3$	$r \geq 4$	0.302933	12.44334974	15.49471
$r = 4$	$r \geq 5$	0.098742	2.783034077	3.841466

Trace test after adjusting the degrees of freedom indicates two co integrating eqn(s) at the 0.05 level

Table 6.5a: Result of Maximum Eigen Value Test for Model 2a

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
$r = 0$	$r \geq 1$	0.791335	41.94811333	33.87687
$r = 1$	$r \geq 2$	0.541426	20.87019949	27.58434
$r = 2$	$r \geq 3$	0.456328	16.31339974	21.13162
$r = 3$	$r \geq 4$	0.302933	9.66031641	14.2646
$r = 4$	$r \geq 5$	0.098742	2.783034077	3.841466

Maximum eigen value test after adjusting the degrees of freedom indicates 1 co integrating eqn(s) at the 0.05 level

The likelihood ratio statistics from trace test indicates the presence of two co-integrating vector at 5 percent level of significance after adjusting the degrees of freedom.

Following Qayyum (2005), we retain only the first co-integrating vector which is associated with the highest/max eigen value. However, maximum eigen value test after adjusting the degrees of freedom indicates 1 co integrating eqn(s) at the 0.05 level. Both tests after adjustment of degrees of freedom report the existence of a co-integrating relationship between economic growth, external financial liberalization through *de jure* measure and other conventional determinants of growth. The empirical result suggests that there exists a unique long-run relationship among economic growth, external financial liberalization through *de jure* measure and other determinants of growth. The long run normalized co-efficient of the estimated co-integrated vector are reported in Table 6.6a.

Table 6.6a: Normalized Co-efficient of Co integrating Vectors on LRGDP for Model 2a

Variable	Co efficient	Standard Error	t-Value
CAL	0.039483***	-0.02414	-1.63558409
LKS	1.645546*	-0.15058	-10.92805153
LELF	-1.371077*	-0.33181	4.13211476
LENRR	-0.712624*	-0.12198	5.84213806

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

The results of the co-integration analysis (Table 6.6a) indicate that the estimated long run coefficient of external financial liberalization through *de jure* measure (cal) is 0.03, which shows that external financial liberalization positively affects economic growth in the long run. This positive coefficient is, however, significant at 10 percent and it implies that 1 percent increase in external financial liberalization through *de jure* measure increase the growth by 0.03 percent. Again despite the smallness of the coefficient, the results are in sharp contrast to majority of the studies evaluating the relationship between external financial liberalization and growth through *de jure* measure in case of developing countries or even for developed ones. The results are in sharp contrast with the international literature like Rodrik (1998), Grilli and Milesi-Ferretti (1995), and Edison *et al.,*(2002). We do not rely much on the results obtained through this measure of external financial liberalization because we have already mentioned in the start of Model 2 that this

is not an accurate measure of the external financial liberalization on account of certain shortcomings. Another important point to mention here is that no one in case of Pakistan has tried to explore the relationship between external financial liberalization and economic growth through this measure.

The estimated long run coefficient of the capital stock positively and significantly impacts the economic growth in the long run. The estimated coefficient for this variable is 1.64, which implies, that a 1 percent increase in capital stock increases economic growth by 1.64 percent. This strong and significant impact of capital stock on economic growth of Pakistan is as reported earlier is in line with the theoretical literature [such as Cobb-Douglas Production function and Solow Growth Model] as well as empirical findings of the studies such as Siddiqui (2004), Burney (1986), Ahmed (1994), IMF (2005), and Das and Paul (2011).

Employed labor force like Model 1 enters here with a negative sign, but is significant. The negative impact of labor force on growth is line with Banam (2010) and Awan *et al*., (2011). This negative impact is once again attributed to low productivity of our workforce along with a dearth of qualified human resource according to the emerging needs of the developing economy. Another plausible reason for this negative impact of labor force on economic growth can be on account of under employment in the informal sector. Employed labor force include both formal and informal sector, however, unfortunately we can not isolate the effect of underemployment in informal sector from total employed labor force.

Enrolment ratio like Model 1 once again negatively and significantly impacts the economic growth in the long run with a coefficient of 0.71. The result is contradictory to majority of the studies exploring the relationship between human capital and economic growth; however, it is in line with few empirical studies. (Awan *et al*., (2011), Spiegel (1994), Lan *et al*., (1991), Dasgupta and Weale (1992), and Pritchett (2001). The negative impact of human capital on growth is attributed to a highly fragmented education system in Pakistan, along with a mismatch between the supply and demand of the educated labor force. Another important factor is not a mere increase in quantity of education, but

attainment of cognitive skills according to the growing needs of the economy are rather important in promotion of growth through human capital.

6.2.3a: Vector Error Correction Model (VECM):

After discussing the results under co-integration for long run relationships, now we present the results obtained under error correction model showing the short run relationship between variables along with error correction term. The short run dynamics of the model are reported in Table 6.7a.

$$\Delta LRGDP_t = c_o + c_1\Delta LRGDP_{t-1} + c_4\Delta CAL_{t-1} + c_6\Delta LKS_t + c_7\Delta LKS_{t-1} + c_8\Delta LKS_{t-2} + c_{12}\Delta LENRR_t + c_{17}INF_{t-2} + c_{18}DUM1998_t + c_{19}DUM2008_t + c_{20}EC_{t-1} \quad \ldots \quad (6.1a)$$

Table 6.7a: Short Run Co-efficient along with Error Correction Term for Model 2a

Variable	Co-efficient	Standard Error	t-Value
C	0.035073*	0.010496	3.341502
D(LRGDP(-1))	0.399047**	0.187145	2.132287
D(CAL(-1))	-0.009491***	0.005084	-1.866651
D(LK)	0.148797*	0.033513	4.43992
D(LK(-1))	-0.133997*	0.037482	-3.574963
D(LK(-2))	0.126993*	0.036263	3.501979
D(LENRR)	-0.076399**	0.033993	-2.247523
INF(-2)	-0.000865***	0.00046	-1.882348
DUM1998	-0.059462**	0.021899	-2.715234
DUM2008	-0.049189*	0.014418	-3.411653
EC(-1)	-0.669287**	0.24005	-2.788119

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

Result under short run error correction model shows that external financial openness through de jure measure that is “cal” negatively impacts the economic growth

with one period lag. The coefficient is very small in magnitude and its significance is also very low reflecting the fact that the negative effect of capital account liberalization is negligible in short run

GDP with one period lag positively contributes to current economic growth in the short run. Capital stock emerges as a positive contributor toward economic growth even in the short run. The overall impact of capital stock on economic growth is positive. The result is again consistent with the positive contribution of capital in economic growth in the long run estimated earlier. The positive contribution of capital stock towards economic growth is also in line with economic theory and it highlights the importance of capital stock as a major contributor to economic growth even in the short run. Enrolment ratio also negatively affects economic growth in the short run, consistent with the negative affect already obtained in the long run model.

Inflation appears to hurt economic growth in the short run, with a two period lag inflation affecting the current economic growth with a coefficient of -0.0008. This variable is significant at 10 percent. The reasons for this negative impact are attributed to an erosion of the purchasing power of money due to high inflation, an increase in cost of production, a decrease in firms' profits on account of higher wages paid to employees and uncertainty about future profitability of investment projects. These findings are also in line with Fischer(1993), Barro(1995), and Shahbaz, Ahmad and Chaudhary (2008).

The dummy for 1998 and 2008 once again appear to be significant in the short run analysis. The significance of these two dummies reflect the fact that economic sanctions imposed on Pakistan on account of nuclear explosions as well as global financial crisis have negatively affected the economic growth in case of Pakistan.

The error correction term reported in Table 6.7a has a correct negative sign and its coefficient is -0.66. This implies that if the system deviates from its equilibrium position (long run path), it converge back to equilibrium with an adjustment speed of 0.66. So the previous period disequilibria are corrected in this model with an adjustment speed of 66 percent.

The result of the diagnostic tests to determine the appropriateness of the model are reported in Table 6.8 a while the result of the stability test is presented in Fig. 6.2a

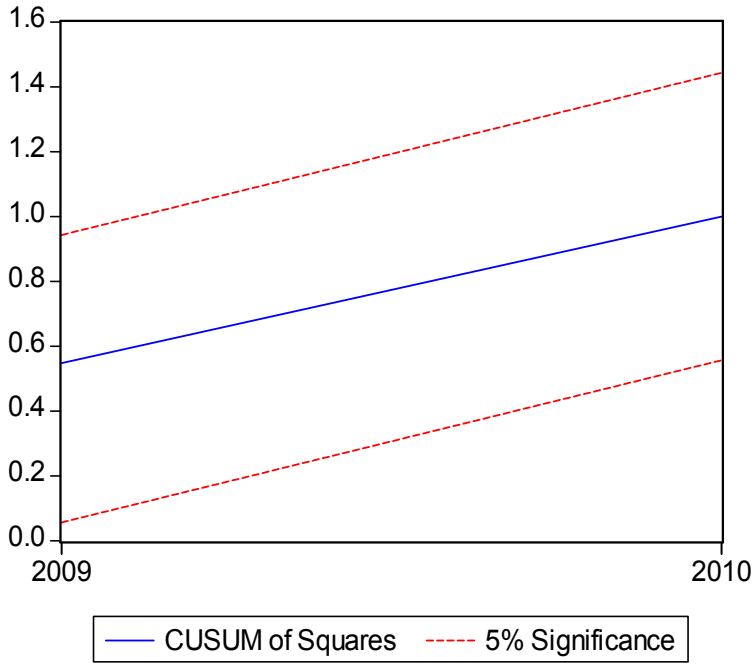
Table 6.8a: Diagnostic Test Results for Model 2a

Serial Correlation LM-Test	
Obs*R-squared	0.535(0.76)
ARCH Test:	
Obs*R-squared	1.488(0.47)
Normality Test	
Jarque Bera	1.179(0.55)
Ramsey Reset Test	
F-Statistic	1.594(0.21)

Note: Values in parenthesis are the respective probabilities.

Plot of CUSUMQ (Stability Test)

Fig 6.2a: Plot of Cumulative Sum of Squares of Recursive Residuals for Model 2a



According to the result of diagnostic tests, the selected model does not suffer from any kind of serial correlation, heteroskedasticity problem or functional form misspecification. The figure for stability test shows that plot of CUSUM of Squares statistic lies within the critical bounds, implying that all the co-efficient in the estimated model are stable.

6.2b: Empirical Result of Model 2b:

This sub section report the econometric result regarding the impact of external financial liberalization on economic growth through *de facto* measure of external financial openness.

6.2.1b: Unit root Testing:

We again employ the same testing procedure to determine the order of integration of variables used in Model 2b. The unit root testing by ADF test statistics for Model 2b is reported in Table 6.2b.

Table 6.2b: Unit Root testing by ADF test statistics for Model 2b[11]

Series	Specification	Level	Ist difference	Decision
Real GDP	Intercept	-2.61(0)	-4.47(0)*	I(1)
FAL (*de facto*)	Intercept	-1.73(2)	-4.83(1)*	I(1)
Employed labor force	Intercept and trend	-1.40(0)	-6.88(0)*	I(1)
Capital Stock	Intercept	-2.49(1)	-3.47(0)**	I(1)
Enrolment ratio	Intercept	-1.35(0)*	-6.38(0)*	I(1)
Inflation rate	Intercept	-4.36(9)*		I(0)

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

[11] The specifications with only intercept for all series except LELF are reported because trend appears to be significant in LELF series.

With the exception of log of FAL (gross stock of foreign assets and liabilities as a ratio to GDP), all other variables are same as in model 1. This *de facto* measure of external financial openness is integration of order 1, i.e., I(1*).*

6.2.3b: Multivariate Co integration Analysis:

We follow the same econometric technique of co-integration suggested by Johenson (1988) and Johenson and Juselius (1990) to study the relationship specified in Model 2b as the one we used to study the relationship specified in model 2a. Log of *de facto* variable (gross stock of foreign assets and liabilities as a ratio to GDP) is integration of order 1, i.e., I(1*).* It is used with other variables of I(1) order of integration in the long run while inflation which is I(0) is used in the short run model in similar fashion as it entered in model 2a (*de jure* model).

The next step is to determine the appropriate lag length for the estimation of Model 2b following AIC criteria. AIC is minimum at 2 lags with structural breaks of 1998, 2005 and 2008. AIC is minimum at 2 lags and given the size of our sample, lag length of 2 is appropriate for our model testing. The results of different lag length selection processes are reported in Table 6.3b, according to which AIC is minimum at 2 lags, so we test our model for co-integration up to 2 lags**.**

Table 6.3b: Lag Length according to different Criterion for Model 2b

Lag	LogL	LR	FPE	AIC	SC	HQ
0	136.4424	NA	1.28E-09	-6.294182	-5.423415	-5.987196
1	363.843	344.1739	2.37E-14	-17.23476	-15.27553*	-16.54404
2	406.0518	2.47577*	1.08e-14*	-18.16496*	-15.11728	-17.09051*

* 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, and HQ: Hannan-Quinn information criterion.

After the selection of appropriate lag length of the model, we now investigate the co-integration relationship between the variables of Model 2b using maximum eigen value test and trace tests. The results from the Johenson co-integration test are presented in Tables 6.4b and 6.5b respectively.

Table 6.4b: Result of Trace test for Model 2b

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
r = 0	r ≥ 1	0.717951	78.45213846	69.81889
r = 1	r ≥ 2	0.492438	44.57096256	47.85613
r = 2	r ≥ 3	0.438121	26.41777308	29.79707
r = 3	r ≥ 4	0.264551	10.98616667	15.49471
r = 4	r ≥ 5	0.097989	2.760672846	3.841466

Trace test after adjusting the degrees of freedom indicates 1 co integrating eqn(s) at the 0.05 level

Table 6.5b: Result of Maximum Eigen Value test for Model 2b

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
r = 0	r ≥ 1	0.717951	33.8811759	33.87687
r = 1	r ≥ 2	0.492438	18.15318949	27.58434
r = 2	r ≥ 3	0.438121	15.43160641	21.13162
r = 3	r ≥ 4	0.264551	8.225493077	14.2646
r = 4	r ≥ 5	0.097989	2.760672846	3.841466

Maximum eigen value test after adjusting the degrees of freedom indicates 1 cointegrating eqn(s) at the 0.05 level

The likelihood ratio statistics from trace test indicates the presence of one co-integrating vector at 5 percent level of significance after adjusting the degrees of freedom. Maximum eigen value test after adjusting the degrees of freedom also indicates one co integrating eqn(s) at the 0.05 level. The result of both tests thus show that there exist a long run relationship between external financial liberalization and economic growth. Both tests after adjustment of degrees of freedom report the existence of a co-integrating relationship between economic growth, external financial liberalization through de facto measure and other conventional determinants of growth. The empirical result suggests that there exists a unique long-run relationship among economic growth, external financial liberalization through *de facto* measure and other determinants of growth. The long run normalized co-efficient of the estimated co-integrated vector are reported in Table 6.6b

Table 6.6b : Normalized Co-efficient of Co integrating Vectors on LRGDP for Model 2b

Variable	Co-efficient	Standard Error	t-Value
LFAL	-1.964723*	-0.53234	3.69072961
LKS	2.660275*	-0.61463	-4.3282544
LELF	-2.293318**	-1.03307	2.21990572
LENRR	-0.927815**	-0.53273	1.74162334

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

The results of the co-integration analysis (Table 6.6b) indicate that the estimated long run coefficient of external financial liberalization through *de facto* measure i.e., log of gross stock of foreign assets and liabilities as a ratio to GDP is -1.96, which shows that external financial liberalization negatively affects economic growth in the long run. Not only that the size of this coefficient is large but it also significantly affects economic growth in the long run at 1 percent level of significance. We have already mentioned that this measure is a relatively much better measure of external openness as it reflects the actual integration of an economy with the international capital markets. The negative sign of this variable actually negate the proposition advocated by proponents of external financial liberalization that opening of capital account of the countries enhance the growth rate of those economies (neo- classical; Fischer, 1998 and Summers, 2000).

The negative impact of *de facto* external financial liberalization on economic growth is attributed to host of factors. Referring to international investment position depicted in Table 6.7 b, normally a country's foreign assets and liabilities are expected to be of similar order of magnitude. However, in case of Pakistan, assets have averaged even less than one third of its international liabilities, thus reflecting its net investment position as strongly negative. Another important feature of Pakistan' international investment position is that total assets relative to GDP have not improved but rather remained stagnant in the range of 6 to 15 percent. While liabilities to GDP decreased in some initial years, they actually show an increasing trend for later years. If we disaggregate total liabilities into FDI and foreign loans, again foreign loans account for almost 86 percent of total liabilities while FDI inflow in contrast account only for 10 percent of total liabilities. This dismal performance of Pakistan's international investment position points to the fact that

the part of inflow which is considered to be a positive contributor to growth (FDI) appears to be very less as compared to foreign loan or debt liability. A huge amount of debt liabilities show the dependence of our economy on external sources. A number of studies in case of Pakistan have come up with the debt negatively affecting the growth rate. (Ahmed and Shakur, 2011; Malik *et al*, 2010; and Iqbal and Zahid, 1998). The above discussion regarding the international investment position of Pakistan thus justifies the negative implications of our external financial openness on economic growth.

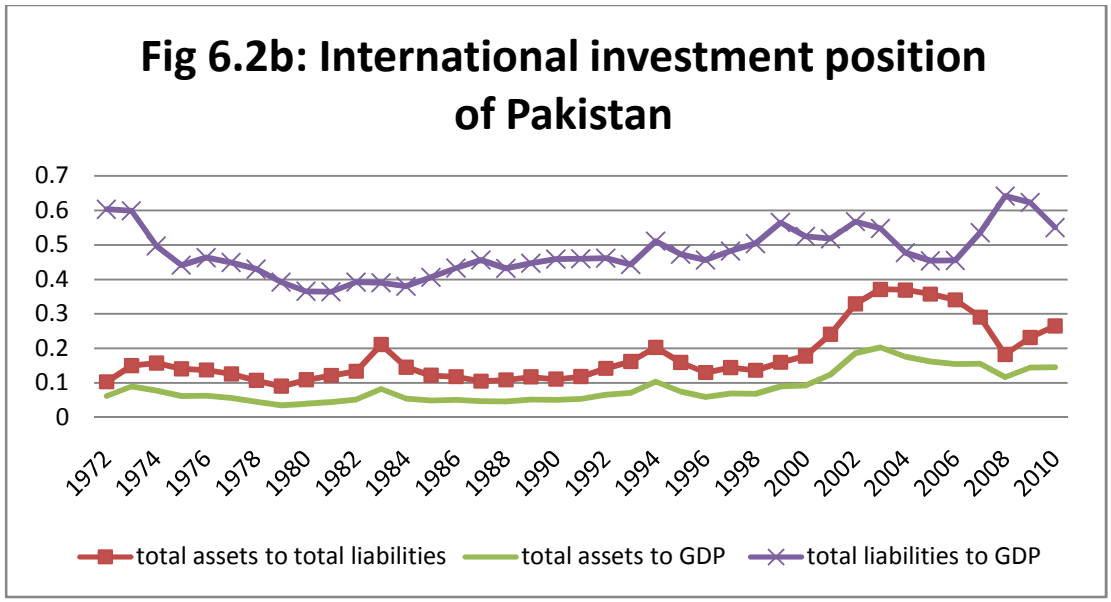
Table 6.7b: International Investment Position of Pakistan

Year	Total assets to total liabilities	Total assets to GDP	Total liabilities to GDP
1972	0.103128382	0.062171049	0.60285101
1973	0.150054975	0.089778186	0.598301963
1974	0.157393268	0.078107211	0.496255093
1975	0.14067804	0.062059803	0.441147768
1976	0.137315228	0.063543267	0.462754698
1977	0.125867842	0.056473153	0.448670223
1978	0.107063877	0.045970544	0.42937492
1979	0.090254695	0.035349921	0.391668503
1980	0.109057343	0.039837806	0.365292281
1981	0.121720127	0.044302384	0.36396926
1982	0.13360895	0.052345922	0.391784547
1983	0.211321074	0.08243053	0.390072454
1984	0.145259055	0.055096474	0.379298037
1985	0.122107155	0.04955354	0.405820117
1986	0.117797055	0.050939625	0.432435471
1987	0.10486085	0.047772637	0.455581246
1988	0.108423407	0.046765739	0.431325117
1989	0.117285523	0.052355538	0.446393866
1990	0.110662682	0.050713385	0.458269976
1991	0.118147839	0.054301348	0.459605084
1992	0.142140062	0.065544212	0.461124124
1993	0.162264131	0.071857385	0.442842076
1994	0.20289273	0.103501153	0.510127459
1995	0.159253752	0.075275569	0.472676896
1996	0.129963533	0.059214718	0.455625643

Continued…

1997	0.144464165	0.069544031	0.481392953
1998	0.136513489	0.068736248	0.503512497
1999	0.159675564	0.090156432	0.564622598
2000	0.177617297	0.093085024	0.524076347
2001	0.241152089	0.124788886	0.517469646
2002	0.329088125	0.186581019	0.566963694
2003	0.371281099	0.20314547	0.547147351
2004	0.369393289	0.176108852	0.476751627
2005	0.35768982	0.162206355	0.453483286
2006	0.341041785	0.1549759	0.454419096
2007	0.290708141	0.155542924	0.535048394
2008	0.182476873	0.1169996	0.641174948
2009	0.23171976	0.144347335	0.622939257
2010	0.265099387	0.145781327	0.549911971

Source: Lane and Ferretti uptill 2007, Author's calculation for 2008-2010



Another important factor for effectiveness of capital account liberalization is sequencing of reforms. Contrary to the usual sequencing of convertibility of current account before undertaking capital account liberalization, Pakistan initiated capital account liberalization before the convertibility of current account. (See chapter 3 on financial sector of Pakistan). The opening of capital account has also proved to be costly to Pakistan in terms of tax evasion. Since FCA scheme introduced in 1991 was costly not only in terms of tax forgone on interest payments to depositors, but was also exempted from any kind

question regarding the source of that income. In a country like Pakistan that has a very low tax to GDP ratio and which need the assistance from both external sources or from internal one to finance its expenditure, this kind of policy has serious detrimental effects on revenue generation and resultantly on economic growth.

International literature on the impact of capital account liberalization on economic growth also reveals an important fact that countries in which external openness has proved to be fruitful in raising their growth rates are mostly the developed ones and those that are strong in terms of quality of institutions. (Klein, 2005; Mody and Murshid, 2005;Klein and Olivei, 2001; Eichengreen, Gullapalli,and Panizza, 2009; Faria and Mauro, 2005). In case of Pakistan, the quality of institutions in spite of improving has deteriorated over time. Bad governance, high corruption, mismanagement, political interference have actually bring our institutions to the brink of collapse. The findings of our study are in line with Pakistani literature, e.g., Haque (2011), Janjua (2011), while contradict to those of Shahbaz et al., (2008). The international literature on the impact of external financial liberalization is mixed and a positive relationship between external financial liberalization and growth is evident only in developed countries or countries with strong institutions. So our findings are also supported by international literature like Edison *et al.,* (2002), Athukorala (2000), and Kose *et al*.,(2006).

The estimated long run coefficient of capital stock positively and significantly impacts the economic growth in the long run. The estimated coefficient for this variable is 2.66 which implies, that a 1 percent increase in capital stock increases economic growth by 2.66 percent. This strong and significant impact of capital stock on economic growth of Pakistan is again in line with the theoretical literature [such as Cobb-Douglas Production function and Solow Growth Model] as well as empirical findings in Siddiqui (2004), Burney (1986), Ahmed (1994), IMF (2005), and Das and Paul (2011).

Employed labor force like Model 2a negatively and significantly impacts the economic growth in the long run. This result is again contradictory to most of the literature on the impact of labor force on economic growth; however, it is in line with the findings of Awan *et al*., (2011) in case of Pakistan and Banam (2010) in case of Iran. This negative

impact is once again attributed to dearth of qualified human resource according to the emerging needs of the economy along with a massive supply of labor force which cannot be absorbed into productive employment.

The result of the Enrolment ratio is also consistent with the previous two models. Enrolment ratio negatively and significantly impacts the economic growth in the long run with a coefficient of 0.92. The result contradictory to majority of the studies exploring the relationship between human capital and economic growth is, however, in line with few studies. (Awan *et al*., (2011), Spiegel (1994), Lan *et al*., (1991), Dasgupta and Weale (1992), Pritchett (2001)). The negative impact of human capital on growth is attributed once again to the reasons already explained in Models 1 and 2a that not only a mere increase in quantity but rather an increase in quality is important in promotion of growth through human capital. Besides this, a fragmented education system in Pakistan along with a mismatch between the supply and demand of the educated labor force is also the cause of a negative relationship between human capital and economic growth.

6.2.3b: Vector Error Correction Model (VECM):

After discussing the results under co-integration for long run relationships, now we present the results obtained under error correction model showing the short run relationship between variables along with error correction term. The short run error correction model with significant variables and an error correction term is given in equation (6.2b).

$$\Delta LRGDP_t = c_1\Delta LRGDP_{t-1} + c_4\Delta FAL_{t-1} + c_5\Delta FAL_{t-2} + c_6\Delta LKS_t + c_7\Delta LKS_{t-1} + c_8\Delta LKS_{t-2} + c_{10}\Delta LELF_{t-1} + c_{11}\Delta LELF_{t-2} + c_{12}\Delta LENRR_t + c_{18}DUM1998 + c_{20}DUM2008 + c_{21}EC_{t-1} \quad \ldots \quad (6.2b)$$

The short run dynamics of the model are reported in Table 6.8b.

Table 6.8b: Short Run Co-efficient along with Error Correction Term

Variable	Co-efficient	Standard Error	t-Value
D(LRGDP(-1))	0.63152*	0.096577	6.539002
D(LFAL(-1))	0.066677**	0.027109	2.459587
D(LFAL(-2))	0.054014***	0.028998	1.862675
D(LK)	0.159432*	0.036481	4.370255
D(LK(-1))	-0.108783*	0.035789	-3.039563
D(LK(-2))	0.125739*	0.03443	3.651969
D(LELF(-2))	0.355151*	0.106628	3.33076
D(LENRR)	-0.088053*	0.032182	-2.736117
DUM1998	-0.057052*	0.02023	-2.820183
DUM2008	-0.079111*	0.015649	-5.055182
EC(-1)	-0.805735*	0.194417	-4.144366

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

Results under short run error correction model are reported in Table 6.8b. GDP with one period lag positively contributes to economic growth in short run. External financial liberalization through de facto approach positively affects the economic growth with one period lag at 5 % level of significance. While with two period lag it positively affects the economic growth at 10 % level of significance in short run. This result is contradictory to the earlier result obtained in the same model in long run where external financial openness was negatively affecting economic growth. This means that the opening of capital account has proved to be beneficial in promoting economic growth in the short run. This positive effect of external financial openness on economic growth is on account of an improved access to foreign capital which has been made possible through capital inflows in the form of FDI, portfolio and debt inflows. This positive contribution of external financial openness to economic growth in short run is in line with Fratzscher & Bussiere (2004) but contradicts to Kim , Lin & Seun (2012).

Capital stock contributes positively and significantly to economic growth in the short run with a positive coefficient of 0.15 for K and 0.12 for K(-2). The capital stock with one period lag negatively contributes to growth, however, the overall impact of this variable emerge out to be positive in short run. This result is again consistent with the

positive contribution of capital in economic growth in the long run estimated earlier in the same model.

Employed labor force with two period lags appear as a positive and significant contributor to economic growth in short run. This implies that economic growth is positively influenced by employed labor force in short run. The positive contribution of this variable in short run is on account of the fact that Pakistan is a labor abundant country and still more than 40 percent of employed labor force is engaged in agriculture and agriculture also constitute bulk of our total output. However, for long run not only a mere increase in number of work force but an increase in quality of labor as well as an increase in the absorption capacity of the economy is necessary to generate a positive impact of employed labor fore on economic growth. Enrolment ratio also negatively affects economic growth in the short run, consistent with the negative affect already obtained in the long run model.

The 1998 and 2008 structural breaks once again appear as significant contributor to economic growth in short run. The negative sign with these two breaks show that both of these events had a detrimental affect on economic growth in the short run.

Finally, the error correction term reported in Table 6.9b shows the speed of adjustment which comes out to be -0.80 and is significant at 1 percent level of significance. The system is converging in this model and the previous period disequilibria are corrected here with an adjustment speed of 80 percent.

Results of certain diagnostic tests are reported in Table 6.9b while the results of the stability test is presented in Fig. 6.3b .

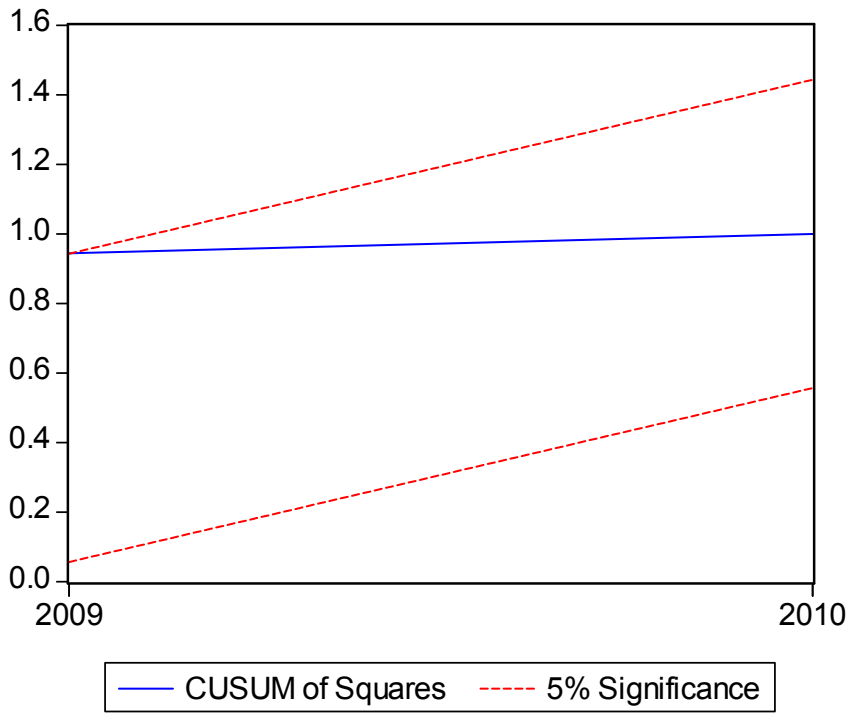
Table 6.9b: Diagnostic Test Results for Model 2b

Serial Correlation LM-Test	
Obs*R-squared	o.185(0.91)
ARCH Test:	
Obs*R-squared	0.879(0.64)
Normality Test	
Jarque Bera	3.714(0.15)
Ramsey Reset Test	
F-Statistic	3.273(0.08)

Note: Values in parenthesis are the respective probabilities.

Plot of CUSUMQ (Stability Test)

Fig 6.3b: Plot of Cumulative Sum of Squares of Recursive Residuals for Model 2b



The results of diagnostic tests show that the selected model is parsimonious on account of the fact that it does not suffer from any kind of serial correlation, hetetskeadasticity problem and functional form of the model is correct. While the figure for

stability test shows that plot of CUSUMQ statistic lies within the critical bounds, implying that all the co-efficient in the estimated model are stable.

6.3: Empirical Result of Model 3:

This section reports the econometric result of an overall impact of financial liberalization on economic growth, incorporating both domestic and external components of financial liberalization**.** Empirical estimation of model 3 is also based on the technique followed in the previous three models (first model of domestic liberalization and then two models of external financial liberalization). Since all the variables used in Model 3 are same as the one used in Model 1 and Model 2b (the external financial liberalization is measured through de facto approach because it is a relatively better measure of external openness as it captures the true/actual integration of an economy with international capital markets), we do not repeat the results of ADF test statistics. (The ADF test statistics for variables employed in model 3 are already reported in unit root testing for Model 1 and Model 2b).

6.3.1: Multivariate Co integration Analysis:

We report the results for Model 3 employing the econometric technique of co-integration suggested by Johenson (1988) and Johenson and Juselius (1990).

First we specify the appropriate lag length for the estimation of Model 3 following AIC criteria. AIC is minimum at 2 lags with structural breaks of 1998, 2005 and 2008. The results of different lag length selection processes are reported in Table 6.3.1, according to which AIC is minimum at 2 lags, so we test our model for co-integration up to 2 lags**.**

Table 6.3.1: Lag Length according to different Criterion for Model 3

Lag	LogL	LR	FPE	AIC	SC	HQ
0	125.4821	NA	1.68E-10	-5.485517	-4.440597	-5.117134
1	397.9523	397.6593	5.10E-16	-18.26769	-15.65539*	-17.34674
2	450.892	60.09361*	2.71e-16*	-19.18335*	-15.00367	-17.70982*

* 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, and HQ: Hannan-Quinn information criterion.

After the selection of appropriate lag length of the model, we now investigate the co-integration relationship between the variables of Model 3 using maximum eigen value test and trace tests. Johenson co-integration test results are presented in Tables 6.3.2 and 6.3.3 respectively.

Table 6.3.2: Result of Trace Tests for Model 3

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
r = 0	r ≥ 1	0.803385	113.5957513	95.75366
r = 1	r ≥ 2	0.687349	70.05541897	69.81889
r = 2	r ≥ 3	0.510759	38.93169692	47.85613
r = 3	r ≥ 4	0.334019	19.79438128	29.79707
r = 4	r ≥ 5	0.283192	8.912837692	15.49471
r = 5	r ≥ 6	3.51E-06	9.36923E-05	3.841466

Trace test after adjusting the degrees of freedom indicates two cointegrating eqn(s) at the 0.05 level

Table 6.3.3: Results of Maximum Eigen Value Tests for Model 3

Null Hypothesis	Alternative Hypothesis	Eigen value	Test Statistics with adj d.f	0.05 Critical Value
r = 0	r ≥ 1	0.803385	43.54033974	40.07757
r = 1	r ≥ 2	0.687349	31.12372205	33.87687
r = 2	r ≥ 3	0.510759	19.13731564	27.58434
r = 3	r ≥ 4	0.334019	10.88154359	21.13162
r = 4	r ≥ 5	0.283192	8.912741026	14.2646
r = 5	r ≥ 6	3.51E-06	9.36923E-05	3.841466

Maximum eigen value test after adjusting the degrees of freedom indicates one cointegrating eqn(s) at the 0.05 level

The likelihood ratio statistics from trace test indicate the presence of two co-integrating vector at 5 percent level of significance after adjusting the degrees of freedom. Following Qayyum (2005), we retain only the first co-integrating vector which is associated with the highest/max eigen value. The results of maximum eigen value test, however, after adjusting the degrees of freedom indicates one cointegrating eqn(s) at the 0.05 level. The result of the likelihood ratio test thus show that there exists a unique long run relationship between economic growth, domestic financial liberalization, external financial liberalization and other conventional determinants of growth. The long run normalized co-efficient of the estimated co-integrated vector are reported in Table 6.3.4

Table 6.3.4: Normalized Co-efficient of Co integrating Vectors for Model 3

Variable	Co-efficient	Standard Error	t-Value
LFL	0.066581*	-0.02564	-2.59676287
LFAL	0.380348*	-0.10124	-3.75689451
LKS	1.158295*	-0.10357	-11.18369219
LELF	-0.103296	-0.18054	0.57215022
LENRR	-0.87489*	-0.09927	8.81323663

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

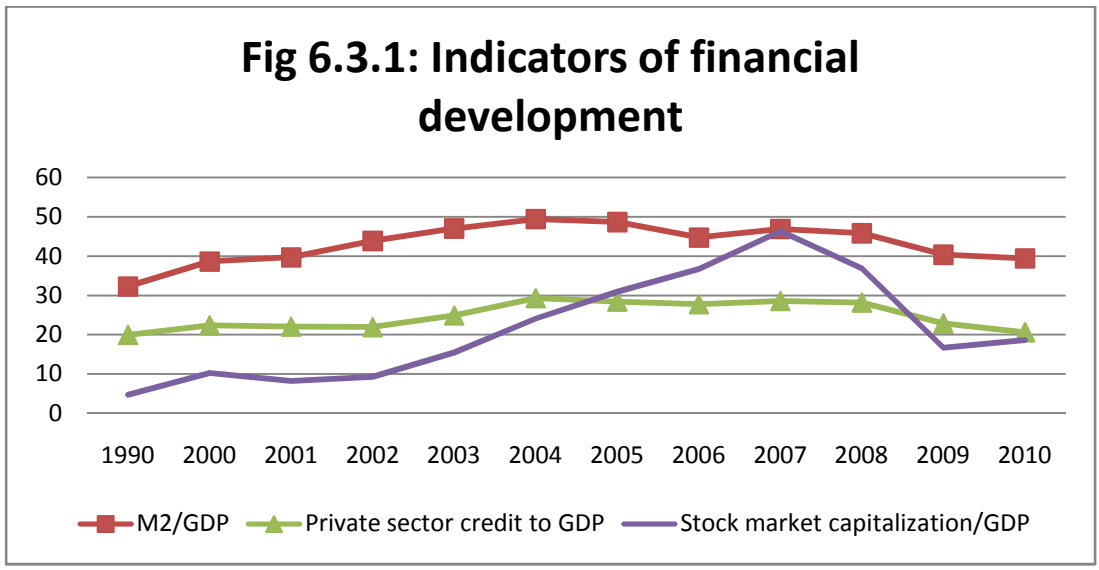
The results of the co-integration analysis (Table 6.3.4) present interesting picture regarding the overall impact of domestic and external measures of financial liberalization on economic growth. The results showing the impact of domestic financial liberalization was found to be positive and significant in long run when we estimated this variable separately in Model 1. In Model 3, the result remains intact with a positive contribution of domestic financial liberalization in economic growth. Contrary to this, the results of external financial liberalization in Model 3 are not consistent with Model 2b, where external financial liberalization affects negatively and significantly to economic growth in the long run.

The estimated long run coefficient of domestic financial liberalization is 0.06 and it affects economic growth significantly in the long run. Similarly, the estimated long run coefficient of external financial liberalization through *de facto* approach is 0.38 and it also significantly impacts the economic growth in the long run. The overall impact of total financial liberalization on economic growth (both internal and external) in case of Pakistan thus emerges out to be positive. A justification of positive implication of domestic financial liberalization and negative implication of external financial liberalization on economic growth has already been discussed in their separate models (Model 1 and model 2b). The simultaneous impacts of both domestic and external financial liberalization variables on growth in a single model i.e., Model 3 now emerge out to be positive. Based on this result, we discuss how overall financial liberalization (both internal and external) has contributed positively in the economic growth of the country.

Realizing the intrinsic weaknesses of the financial sector emerged on account of repression policies of the 1970s and 1980s, the government of Pakistan initiated a broad based program of financial reforms on the recommendation of IMF and the World Bank in the late 1980s.The financial repression policies adopted in the pre reform era have severely deteriorated the financial structure of the economy resulting in financial inefficiency, private sector crowding out, declining assets quality, and increasing vulnerability of the financial institutions. The reforms introduced in the dire need of the country thus moved the economy not only to a market based indirect system of monetary, exchange and credit

management, but it also improved prudential regulations, strengthen the corporate governance and supervision and empowered the central bank of the country.

The positive impact of overall financial liberalization on economic growth highlights the importance of financial intermediation and financial deepening, which has occurred on account of financial liberalization. Removing the interest rate ceiling, abolishing the directed and controlled credit programs, developing the security markets, strengthening the Central Bank and giving it more autonomy are among the key factors that have contributed toward developing a more stable financial system. Financial liberalization has accelerated the financial development thus raising the capability of financial intermediaries to provide resources, which has helped in enhancing investment and growth in the country. To get an overview of how financial liberalization has actually promoted financial development in case of Pakistan, some important financial development indicators are presented in Figure 6.3.1. These three variables, i.e., M2/GDP, Privates sector credit to GDP, and Stock market capitalization/GDP are important variables not only in the context of financial development of an economy but they are also important indicators of financial deepening. Overall, they present an increasing trend for the entire period after the reforms with the exception of a stagnant or low ratios only for the last two or three years.



Source: Khan and Qayuum (2007) and SBP Statistical Bulletin (various issues).

An important point worth mentioning here is that external financial liberalization through *de facto* approach (when estimated separately) was negatively affecting the economic growth, however when it is estimated along with domestic financial liberalization measure it is positively influencing the growth. The positive impact of external financial openness is thus justified on account of the fact that if external financial liberalization is accompanied with domestic financial liberalization, then it will positively impact the growth rate. No doubt, that presence of certain level of financial development will make external financial openness successful. Our results thus points to the fact that external financial openness followed by domestic financial liberalization has actually made a positive impact of an overall financial liberalization on growth.

The external financial liberalization has appeared to improve the county's access to private foreign capital. The inflow of foreign capital has helped in raising the investment rate in the country. (Haque , 2011). The access to foreign capital on account of external financial openness accompanied with an improved access to capital through domestic financial liberalization measures have actually contributed to the economic growth of the country. The financial liberalization has also lead to intensify the competition among the financial institutions in the country (Khan, 2009). Not only that private ownership of the banking industry has led to provision of efficient services on account of increase in the competition but they have also brought more efficient allocation of credit. The share of government or public sector in total credit has significantly declined in recent years while that of private sector significantly increased (Waheed, 2009)

Since we know that primary objective of financial liberalization is to increase the supply of the funds and improve the allocation of funds for investment. The availability of the funds on account of not only domestic liberalization but also the external one has also been a source of positive impact of liberalization on growth.

A simultaneous impact of both domestic and external financial liberalization on growth (through the measures we have used) has not been studied in case of Pakistan or even in international literature. The studies which examine the overall impact of liberalization on growth use dummy variable for capital account openness along with other

domestic liberalization measures. Or other solely checks the impact of external financial openness on growth through either *de jure* or *de facto* approach. So our results are novel in nature that the relationship between financial liberalization and growth has not been studied earlier employing the variable of domestic financial liberalization through an index and external financial liberalization through de facto approach in case of Pakistan.

Among other determinants of growth, the estimated long run coefficient of capital stock like all other previous models positively and significantly impacts the economic growth in the long run. The estimated coefficient for this variable is 1.15 which implies, that a 1 percent increase in capital stock increases economic growth by 1.15 percent. These findings get support from the existing economic growth theories in the literature [such as Cobb-Douglas Production function and Solow Growth Model] as well as consistent with empirical findings (Siddiqui (2004), Burney (1986), Ahmed (1994), IMF (2005), and Das and Paul (2011).Overall, the emergence of capital as an important contributor to growth in these studies is on account of significant increase in the investment ratio or growth in total and fixed investment rates. Our findings highlight the importance of this primary factor of production in output generation or economic development of the economy.

Employed labor force, contrary to capital stock, negatively affects economic growth in the long run in above estimated model. However, this negative impact is insignificant in the long run. The result regarding the negative implication of employed labor force on economic growth is in line with the findings of Awan *et al*., (2011) in case of Pakistan and Banam (2010) in case of Iran. The justification for this negative impact once again can be attributed to a dearth of an educated, skillful labor force which should constitute a bulk of human capital necessary to promote growth in the country. The qualified human resources like engineers, qualified technicians, agriculturists, etc who can participate in the economy to uplift its status and move it toward the roads to progress in fact lack in case of Pakistan. Besides this, a massive supply of labor force which can not be absorbed into productive employment can also be an additional burden on the economy.

Enrolment ratio like employed labor force also negatively and significantly impacts the economic growth in the long run with a coefficient of 0.87. The negative impact of

human capital on economic growth is in line with Pakistani literature of Awan *et al.,* (2011) and international studies like Spiegel (1994), Lan*, et al*., (1991), Dasgupta and Weale (1992), and Pritchett (2001). The result is, however, contradictory to majority of the studies exploring the relationship between human capital and economic growth. The negative impact of human capital on growth is attributed once again to host of factors already discussed in all three models. The education system in Pakistan is highly fragmented coupled with issues of access, quality and governance. There also exists a disparity in the supply of skilled, educated and trained manpower and the jobs demanded by the growing needs of the economy. Besides this, another important factor is not a mere increase in quantity of education, but attainment of cognitive skills according to the growing needs of the economy or quality of education is rather important in promotion of growth through human capital.

6.3.2: Vector Error Correction Model (VECM):

After discussing the results under co-integration for long run relationships, now we present the results obtained under error correction model showing the short run relationship between variables along with error correction term. The parsimonious dynamic error correction model showing the short run dynamics is presented below and reported in Table 6.3.5.

$$\Delta LRGDP_t = c_1\Delta LRGDP_{t-1} + c_5\Delta LFL_{t-2} + c_7 LFAL_{t-1} + c_8\Delta LFAL_{t-2} + c_9\Delta LKS_t + c_{10}\Delta LKS_{t-1} + c_{11}\Delta LKS_{t-2} + c_{13}\Delta LELF_{t-1} + c_{15}\Delta LENR_t + c_{16}\Delta LENRR_{t-1} + c_{21}DUM1998 + c_{23}DUM2008 + c_{24}EC_{t-1} \quad \ldots \quad (6.3).$$

Table 6.3.5: Short Run Co-efficient along with Error Correction Term for Model 3

Variable	Co-efficient	Standard Error	t-Value
D(LRGDP(-1))	0.572162*	0.162654	3.517671
D(LFL(-2))	-0.041869*	0.010264	-4.079136
D(LFAL(-1))	0.098604*	0.028695	3.436319
D(LFAL(-2))	0.072837**	0.030406	2.395484
D(LK)	0.194581*	0.037832	5.143242
D(LK(-1))	-0.085974**	0.032921	-2.611568
D(LK(-2))	0.091126**	0.033554	2.715819
D(LELF(-1))	0.201547**	0.094558	2.131453
D(LENRR)	-0.097179*	0.029612	-3.281722
D(LENRR(-1))	-0.055036***	0.026698	-2.061394
DUM1998	-0.060245*	0.018675	-3.225979
DUM2008	-0.059675*	0.012772	-4.672451
EC(-1)	-0.934295*	0.248382	-3.76153

* implies significance at 1% level, ** implies significance at 5% level, *** implies significance at 10 %level

Results under short run error correction model shows that economic growth is positively and significantly affected by its own lag which shows that previous period economic growth positively contribute to current period economic growth in the short run.

Domestic financial liberalization with two period lag negatively impacts the economic growth in the short run with a coefficient of 0.04. The negative impact of domestic financial liberalization on economic growth in short run contradicts the results of long run positive impact of domestic financial liberalization on economic growth. This result is not surprising on account of the fact that liberalization is not a one time event, rather it's a gradual process and a study of liberalization on economic growth in short run is just a false exercise.

The external financial openness through de facto approach, however, positively contributes to economic growth in the short run. This means that the opening of capital account has proved to be beneficial in promoting economic growth in the short run. This

positive effect of external financial openness on economic growth is on account of an improved access to foreign capital which has been made possible through capital inflows in the form of FDI, portfolio and debt inflows. This positive contribution of external financial openness to economic growth in short run is in line with Fratzscher & Bussiere (2004) but contradicts to Kim , Lin & Seun (2012).

The overall impact of capital stock on economic growth also emerge out be positive in the short run. This result is again consistent with the positive contribution of capital in economic growth in the long run estimation of model 3. The positive contribution of capital stock towards economic growth is also in line with the economic theory and it highlights the importance of the capital stock as a major contributor to economic growth even in the short run.

Employed labor force with one period lag positively affects economic growth in the short run. This result shows the importance of employed labor force as a significant contributor in short run which means that employed labor force used as an input in production enhances the economic growth in short run. In case of Pakistan this input positively contributes to economic growth in short run because Pakistan is a labor abundant country and still more than 40 percent of employed labor force is engaged in agriculture and agriculture also constitute bulk of our total output. However, for long run not only a mere increase in number of work force but an increase in quality of labor as well as an increase in the absorption capacity of the economy is necessary to generate a positive impact of employed labor fore on economic growth. Enrolment ratio, however, still appear to influence negatively the economic growth in the short run.

The dummy for 1998 and 2008 once again appear as significant negative contributors to economic growth. This implies that 1998 nuclear explosion and 2008 global financial crisis have in fact negatively influenced the economic growth in the short run. Finally, the error correction term reported in Table 6.3.5 comes out to be -0.93 which shows that speed of adjustment is very high and it conveys the message that the previous period disequilibrium is corrected with an adjustment speed of 93 percent.

To determine the appropriateness of the model, result of diagnostic test is reported in Table 6.3.6. and the result of the stability test is presented in Fig.6.3.2 .

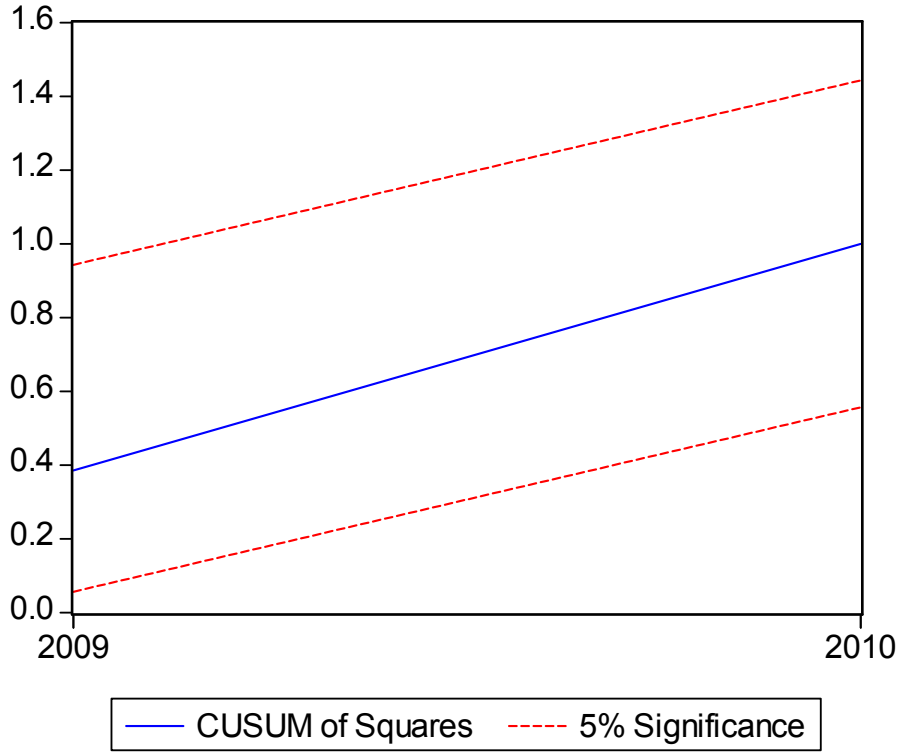
Table 6.3.6: Diagnostic Test Results for Model 3

Serial Correlation LM-Test	
Obs*R-squared	1.122(0.57)
ARCH Test:	
Obs*R-squared	0.958(0.61)
Normality Test	
Jarque Bera	2.869(0.23)
Ramsey Reset Test	
F-Statistic	0.163(0.68)

Note: Values in parenthesis are the respective probabilities.

Plot of CUSUMQ (Stability Test)

Fig 6.3.2: Plot of Cumulative Sum of Squares of Recursive Residuals for Model 3



The results of diagnostic tests show that the selected model does not suffer from any kind of serial correlation, heteroskedasticity problem or functional form misspecification. While the figures for stability test shows that plot of CUSUMQ statistic lies within the critical bounds, implying that all the co-efficient in the estimated model are stable.

Chapter 7

Conclusion and Policy Recommendations

The liberalization of financial sector and its relationship with economic growth has received considerable attention among the researchers, policy makers and other stakeholders both in the developed and developing countries. The changing landscape of financial sectors worldwide on account of not only the liberalization of their domestic financial markets, but external financial liberalization make liberalization of financial markets the most hot debated topic in today's international economics. The international research on this topic provides mixed evidence both in terms of cross –country studies or country specific cases. Moreover, the studies done so far either evaluate the impact of financial liberalization on growth through various dimensions of reforms on domestic front while incorporating the external liberalization only through capital account liberalization (using a dummy or scaled variable). Or solely assess the impact of external financial liberalization on growth. Not even a single study is found in the literature that thoroughly examines the impact of domestic financial liberalization and external financial liberalization (through a true measure of openness/liberalization) on economic growth. The present study was an attempt to fill these existing gaps by thoroughly examining the impact of domestic and external financial liberalization on economic growth of Pakistan using the time series data from 1972 -2010.

Pakistan like many developing countries introduced financial sector reforms during the late 1980s under the Structural Adjustment program of IMF and World Bank. The objective of reforms was to create a level playing field for financial institutions and markets by instilling competition, removing the distortion and segmentation in financial markets thereby increasing competition, efficiency and productivity of the financial sector.

To thoroughly investigate the liberalization of financial sector in Pakistan and its resultant impact on economic growth, we split the liberalization of financial sector and its relationship with growth into three different models. Model 1 examines the impact of domestic financial liberalization on economic growth along with other control variables. Model 2 studies the external financial liberalization through two measures of financial openness. i.e., *de jure* and *de facto*. Model 3 finally reports an overall impact of financial liberalization on economic growth

employing domestic financial liberalization index and de facto measure of external financial openness.

To construct the measure of domestic financial liberalization, we have thoroughly examined the reform process introduced in Pakistan since the late 1980s. Following the method of Bandiera *et al*. (1999), the selection of seven different aspects of financial reforms have been made, while the data set has been constructed following the methodology of Abiad *et al*. (2008). The constructed data set on seven main dimensions of financial reforms is then utilized to construct a financial liberalization index through principal component analysis (PCA). In our data set, the seven main components of domestic financial liberalization include: interest rate regulation, credit controls, reserve requirements, banking ownership, prudential regulation measures, pro-competitive measures and security market development.

The external financial liberalization has been analyzed through two different measures. For the measurement of external financial liberalization through *de jure* measure for Model 2a, we constructed our own quantitative measure. Our measure resembles the one constructed by Quinn (1997), who has also developed a scale showing fully restricted capital account to a free capital account. The *de jure* measure of financial openness was also constructed on the basis of information under the capital account liberalization. Capital account transactions were scaled in terms of three dimensions of capital account openness namely exchange rate system, restrictions on capital inflow and restrictions on capital outflow. However, on the basis of certain short comings related to *de jure* measure, as mentioned in chapter 5, and in order to measure the true integration of Pakistan's financial sector with international markets, we have also used *de facto* measure of external financial liberalization in determining the impact of external financial liberalization on growth. The *de facto* measure of external financial liberalization is based on the work of Lane and Ferretti (2006) while the data for remaining years are updated utilizing their methodology.

The results of domestic financial liberalization on economic growth in Model 1 indicate a positive impact of composite index of domestic financial liberalization on economic growth. Although size of the coefficient of domestic liberalization index (0.07) is not very large, nevertheless it conveys a clear message that domestic reforms undertaken in Pakistan during the

late 1980s onward have contributed positively to economic growth of Pakistan. These results thus highlight the importance of financial deepening and financial intermediation which has been achieved on account of financial liberalization. A move toward a market-based mechanism have actually made financial sector more supple and resilient and has increased financial intermediation and deepening, which has contributed positively to economic growth. Financial liberalization has also accelerated financial development raising the capacity of financial intermediaries to supply funds, which has helped in enhancing investment and growth in the country. Our findings are in line with Mc-Kinnon and Shaws (1973) financial liberalization thesis and majority of studies in Pakistan (Mohammad (2010), Khan and Qayuum (2007).

External financial liberalization when measured through *de jure* approach positively impacts economic growth, while its impact on growth is negative when we measure it through *de facto* approach. We do not rely much on the results obtained through *de jure* measure on account of certain shortcomings related to this measure. However, we evaluate the results under *de facto* measure that actually hurts economic growth by 1.96 percent in the long run. This negative impact of external financial liberalization on economic growth is attributed to dismal performance of Pakistan's international investment position with stagnant or decreasing assets position while an increasing trend of those liabilities which are actually detrimental to growth.

An interesting result of this study is that when we jointly analyze the impact of both domestic and external components of financial liberalization, domestic financial liberalization result remains the same as in separate model; it still positively impacts the economic growth. However, surprisingly, in overall model, the external financial liberalization also impacts economic growth positively which separately was having a negative impact on economic growth. The positive impact of external financial openness is thus justified on account of the fact that if external financial liberalization is accompanied with domestic financial liberalization, then it will positively impact the economic growth. No doubt, that presence of certain level of financial development will make external financial openness successful. Our results thus points to the fact that domestic financial openness followed by external financial liberalization has actually made a positive impact of an overall financial liberalization on economic growth.

The positive impact of overall financial liberalization on economic growth (both internal and external) in case of Pakistan thus points us to conclude that financial intermediation and financial deepening in Pakistan has been intensified on account of financial liberalization which have contributed to the development of the financial sector. Apart from this, an easy access to capital on account of external financial openness accompanied with an improved access to capital through domestic financial liberalization measures have also contributed to the economic growth of the country.

The result of a positive impact of financial liberalization on economic growth thus justifies the introduction of more reforms in the financial sector of Pakistan. The reforms have succeeded in moving the financial sector from a repressed environment to market based indirect system of monetary, exchange and credit management. The reforms have also removed distortions and segmentation in the financial markets, and intensified the competition among financial institutions in the country.

Improvement on several fronts has been observed in the financial markets of Pakistan on account of financial liberalization measures. However, an important indicator of financial efficiency i.e., interest rate spread depicts a disappointing picture. Interest rate spread rather than decreasing has increased even after the introduction of reforms. The provision of financial services to rural population of Pakistan is still limited despite an improvement of access of the urban population to financial services. The sequencing of reforms especially in the external financial sector has not been in line with the proposed sequencing of current account followed by gradual openness of capital account. The institutions in Pakistan and also a strong macro economic environment lack enough compatibility that is required for successful implementation of reforms. Despite the autonomy granted to the State Bank of Pakistan, the political interference places a barrier on its free functioning. The excessive government borrowing neutralizes any impact of the Central Bank's efforts to contain money and credit expansion.

In the current study, the impact of control variables on economic growth for all models remains same. Capital Stock emerges out as a significant contributor to economic growth, while employed labor force and enrolment ratio negatively impacts the economic growth in all models. Inflation also hurts economic growth in the short run in model 2a. While the dummy for 1998

and 2008 also appears as significant negative contributor to economic growth in the short run in all the models.

In the light of the above mentioned results, the study proposes some policy recommendations. There is no denying in the fact that financial liberalization carried under the broad based financial restructuring/financial reform have helped in making the financial sector more supple, resilient, deep and has helped in contributing to economic growth of the country. However, to get more pronounced benefits from the financial liberalization process, the financial inefficiency for example resulting from increased interest rate spread needs to be reduced. Financial sector needs to be further strengthened and grow at a faster pace to meet not only the domestic requirements but to successfully integrate itself with the international markets. The development of a dynamic and robust financial system will efficiently utilize the domestic and foreign resources and will ultimately helpful in achieving higher and sustainable economic growth.

There is no doubt in the result obtained under Model 3 showing an overall positive impact of financial liberalization on economic growth through domestic liberalization as well as through external financial liberalization. However, as revealed by the international investment positions of Pakistan, that the inflow in the form of debt is relatively much more as compared to FDI. Hence, we should improve the international investment position of the country in terms of growth promoting longer term inflows instead of short term, growth deteriorating inflows. We need to integrate ourselves more with the international financial markets in order to get the benefit from opening of capital account. However, we also need to deal carefully with any further opening of capital account as the costs attached to a full liberalization of capital account/external financial liberalization and the challenges faced by the economy in terms of macro economic management or real cost of unhindered capital flows can be enormous and detrimental in the absence of strong macroeconomic environment, strong institutions and political stability.

The dissertation has examined the impact of domestic and external financial liberalization on economic growth of Pakistan using the time series data from 1972 -2010. However, there are still some limitations in the current dissertation as the data used in the current thesis is on annual

basis and covers the period from 1972-2010. This is a reasonable time span to study the impact of financial liberalization on economic growth; however, the number of observations on annual basis comes out to be 38 for each variable. If the quarterly data instead of annual one would have been used that would have provided us with more observations as compared to current number of observations. Another important aspect relating to current functioning/operation of financial sector needs some more insight as financial liberalization is also related to ease of financial transactions besides moving from an environment of financial repression to financial liberalization.

The current thesis can be extended for further research by addressing the above mentioned limitations. Quarterly data instead of annual one will increase the frequency /no. of observations of data and will capture the policy changes on high frequency and provide more detailed information regarding the financial liberalization process. Besides this, the thesis can be extended to incorporate micro or firm/industry level data to explore in detail the other plausible channels through which financial liberalization can affect economic growth.

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APPENDIX 1

Table A1: Scheduled Banks Operating in Pakistan, as on 30th June, 2010

A	**Public Sector Commercial Banks**
1	First Women Bank Ltd.
2	National Bank of Pakistan
3	The Bank of Khyber
4	The Bank of Punjab
B.	**Local Private Banks**
1	Allied Bank Ltd.
2	Arif Habib Bank Ltd.
3	Askari Bank Ltd.
4	Atlas Bank Ltd.
5	Bank Al-Falah Ltd.
6	Bank Al-Habib Ltd.
7	Bank Islami Pakistan Ltd
8	Dawood Islamic Bank Ltd.
9	Dubai Islamic Bank Pakistan Ltd
10	Emirates Global Islamic Bank Ltd.
11	Faysal Bank Ltd.
12	Habib Bank Ltd.
13	Habib Metropolitan Bank Ltd
14	JS Bank Ltd.
15	KASB Bank Ltd.
16	MCB Bank Ltd.
17	Meezan Bank Ltd.
18	mybank Ltd.
19	NIB Bank Ltd.
20	Samba Bank Ltd.
21	Silk Bank Ltd.
22	Soneri Bank Ltd.
23	Standard Chartered Bank (Pakistan) Ltd.
24	The Royal Bank of Scotland Ltd.
25	United Bank Ltd.
C	**C. Foreign Banks**
1	Al- Baraka Islamic Bank B.S.C (E.C)
2	Barclays Bank PLC
3	Citibank N.A

4	Deutsche Bank
5	HSBC Bank Middle East Ltd.
6	Oman International Bank
7	The Bank of Tokyo-Mitsubishi
D	**Specialized Banks**
1	Industrial Development Bank of Pakistan
2	Punjab Provincial Cooperative Bank Ltd.
3	SME Bank Ltd.
4	Zarai Traqiati Bank Ltd.

Source: Osec, Business Network Switzerland, 2011

APPENDIX 2

Solution of Optimization problem (Derivation of Equation (3))

The representative's consumer's objective function and flow budget constraint are as follows:

$$\max\ \mu = \int_o^{\alpha} \frac{C_t^{1-\sigma} - 1}{1-\sigma} e^{-\rho t} dt$$

s.t.

$$\dot{V}_t = rV_t + w - c_t$$

Using Hamiltonion to solve this optimization problem,

$$H = \frac{c_t^{1-\sigma} - 1}{1-\sigma} e^{-\rho t} + \lambda_t \left[rV_t + w - c_t \right] \qquad \ldots\ldots\ldots\ldots\ldots\ldots \quad \text{Eq (1)}$$

Conditions

(1) $\frac{\partial H}{\partial C} = 0$ (2) $\frac{\partial H}{\partial \lambda_{(t)}} = \dot{V}_{(t)}$ (3) $\frac{\partial H}{\partial V_{(t)}} = \lambda_{(t)}$

(1) $\frac{\partial H}{\partial C} = 0$,

For this take derivative of eq (1) w.r.t consumption

$$\frac{\partial H}{\partial C} = \frac{1-\sigma . C_t^{1-\sigma-1}}{1-\sigma} \quad e^{-\rho t} - \lambda(t) = 0$$

$$C_t^{-\sigma} . e^{-\rho t} = \lambda(t) \qquad \ldots\ldots\ldots\ldots\ldots\ldots \qquad \text{Eq (2)}$$

(2) $\frac{\partial H}{\partial \lambda_{(t)}} = \dot{V}_{(t)} \Rightarrow \frac{\partial H}{\partial \lambda_{(t)}} = rV_t + w - C_t$

or $\dot{V}_{(t)} = rV_t + w - C_t \qquad \ldots\ldots\ldots\ldots\ldots\ldots \qquad \text{Eq (3)}$

(3) $\frac{-\partial H}{\partial V_{(t)}} = \dot{\lambda}_{(t)}$

$$-\lambda(t)r = \dot{\lambda}(t)$$
$$\dot{\lambda}(t) / \lambda(t) = -r \qquad \ldots\ldots\ldots\ldots\ldots\ldots \qquad \text{Eq (4)}$$

Solving optimization problem and deducing usual Keynes-Ramsay condition we proceed as follow.

Since consumption path or growth rate of consumption is given by $\frac{\dot{c}_{(t)}}{c_{(t)}}$, we will derive this by following steps.

Taking the log of Eq (2),we get

$$-\sigma \ln c_t . - \rho t = \ln \lambda(t)$$

Take derivative of above equation,

$$-\sigma \frac{1}{c_t} . \frac{\partial c_t}{\partial_t} - \rho = \frac{1}{\lambda(t)} . \frac{\partial \lambda_{(t)}}{\partial_t}$$

$$-\sigma \frac{\dot{c}_{(t)}}{c_{(t)}} - \rho = \frac{\dot{\lambda}_{(t)}}{\lambda_{(t)}} \qquad \text{…….. Eq (5)}$$

By placing the value of $\dot{\lambda}_{(t)} / \lambda_{(t)}$ from Eq (4) in Eq (5), we get,

$$-\sigma \frac{\dot{c}_{(t)}}{c_{(t)}} - \rho = -r$$

$$-\sigma \frac{\dot{c}_{(t)}}{c_{(t)}} = -r + \rho$$

$$\frac{\dot{c}_{(t)}}{c_{(t)}} = \frac{1}{\sigma}[r - \rho] \qquad \text{…….} \qquad \text{Eq (6)}$$

APPENDIX 3

CODING RULES/ SCALE TO CONSTRUCT DATA SET OF DOMESTIC FINANCIAL LIBERALIZATION INDEX[12]

Domestic financial liberalization index has been constructed on the basis of the data set generated according to seven main dimensions of financial liberalization process. Codes have been assigned to these seven dimensions. Each dimension is further subdivided into a sub-dimension. For each policy variable, the sub-dimension's score or code is added to scale it under the specific category described at the end of each policy variable. However, to get the final coding and a consistent scale showing the restrictiveness of a regime to a full liberalization of a regime, each of the policy variables getting a raw score according to its sub-dimension is then finally coded under 0 to 4 scales (The explanation for this transformation is indicated at the end of each policy variable.). Where 0 represents complete restriction and 4 indicates full liberalization. Between these extreme numbers, 1 refers to highly restricted, 2 represent moderately restricted, while 3 is for weakly restricted. The detailed construction and assigning of different codes and calculation of final score is explained in the following.

I- Interest Rate Regulation (INR):

Interest rate regulation is scaled in terms of regulation/control on deposit and lending rates as well as open market operations (OMOs) as the market-based instruments of the monetary management.

1) Deposit rate:

0 = if deposit rate is set by the government or is subject to a ceiling/floor.

1= if deposit rate is subject to a band.

2= If deposit rate is determined at market rate or is freely floating.

[12]These coding rules and scale of financial liberalization are constructed by following Abiad *et al.*(2008),keeping in mind the special features of financial liberalization process in Pakistan.

2) Lending rates:

0 = if lending rate is set by the government or is subject to ceiling/floor.

1= if lending rate is subject to a band.

2= If lending rate is determined at market rate or is freely floating.

3) Open Market Operation:

0 =If on tap and adhoc treasury bills system exists and no OMOs used as instruments of monetary management.

1= full fledged auctioning system but still with no OMOs.

2= OMOs as the main instruments of monetary management.

The above three dimensions of interest rate regulation are summed and scaled as follows

Completely restricted=[0], highly restricted=[1], moderately restricted=[2,3],weakly restricted=[4], fully liberalized=[5,6]

This summed up scale for each year is coded as follows.

Completely restricted= [0], highly restricted= [1], moderately restricted [2], weakly restricted= [3], fully liberalized= [4]

II- Credit Control (CRD):

Credit control is scaled in terms of three dimensions of credit availability mentioned as directed credit, credit ceiling and subsidized credit.

1) Directed credit:

0= if the allocation of credit is directly controlled and credit is allocated to priority sectors.

1= if policy of directed credit abolished and mandatory credit allocation to certain sectors is eliminated.

2) Credit ceiling::

0= if credit ceiling as an instrument of credit control exits.

1= if credit ceiling abolished but other form of credit restriction like CDR exists.

2= if all restrictions in the form of credit ceiling or CDR abolished

3) Subsidized credit:

0= if the credit is supplied at subsidized rates to certain sectors

1=if the credit allocation at subsidized rates is eliminated

The above three dimensions of credit allocation are summed and scaled as follows

Completely restricted=[0], highly restricted=[1], moderately restrictions=[2],weakly restricted=[3], fully liberalized=[4]

This summed up scale for each year is coded as follows.

Completely restricted= [0], highly restricted=[1], moderately restrictions=[2],weakly restricted=[3], fully liberalized=[4]

III- Reserve Requirements (RSRV):

Reserve requirements are scaled in terms of regulation/control on Cash Reserve Requirement (CRR) and Statutory Liquidity Requirement (SLR).

1) Cash Reserve Requirement (CRR):

0=if in addition to CRR equivalent to 5% of time and demand liabilities, special cash deposits in any form exists.

1= No special cash deposits exists but CRR equivalent to 5 percent of time and demand liabilities still exist.

2) Statutory Liquidity Requirement (SLR):

0= if SLR is more than 20 percent.

1= if SLR lies between 10-20 percent.

2= if SLR is less than 10 percent.

The above three dimensions of reserve requirement are summed and scaled as follows

Completely restricted=[0], highly restricted=[1], moderately restricted=[2],weakly restricted=[3], fully liberalized=[4]

This summed up scale for each year is coded as follows.

Completely restricted=[0], highly restricted=[1], moderately restrictions=[2],weakly restricted=[3], fully liberalized=[4]

IV- Banking Ownership (BNK):

Bank ownership is scaled in terms of domination of state owned institutions, and the percentage of assets holding by state owned institutions or privately owned institutions.

1) Domination of state-owned institutions:

0=if the entry of private banks is prohibited and state owned institutions dominate the banking industry.

1=if the private banks are allowed to enter in the market.

2) Asset holdings of private/public banks:

0=if majority of the banks are state-owned and percentage of public bank assets is from 50 to 100 percent.

1=f many banks are privately owned but the percentage of public bank assets is still between 25 -50 percent.

2=if most of the banks are privately owned but the percentage of public bank assets is from 10 percent to 25 percent

3= if no state banks exists or state owned banks do not consist of any significant portion of banks and/or the percentage of public bank assets is less than 10 percent.

The above two dimensions of the Bank Ownership are summed and scaled as follows

Completely restricted=[0], highly restricted=[1], moderately restricted=[2],weakly restricted=[3], fully liberalized=[4]

This summed up scale for each year is coded as follows:

Completely restricted=[0], highly restricted=[1] moderately restricted=[2],weakly restricted=[3], fully liberalized=[4]

V- Prudential Regulation Measures (PRD):

Prudential regulations are scaled in terms of autonomy granted to Central Bank, Implementation of Basel I and Basel II, Introduction of CAMELS.

1) Autonomy of the Central Bank:

0= if the Central Bank is not fully autonomous and is under the influence of Ministry of Finance (MOF).

1= if the Central Bank is granted full autonomy and is now an independent supervisory agency.

2= if the powers of Central Bank are further strengthened.

2) Basel Accord:

0=When the Basel Accord was not in place.

1=Implementation of Basel I (When risk-weighted Capital adequacy ratio of 8 percent was enforced.

2=Implementation of Basel II(Issuance of complete roadmap for implementation of Basel-II)

3)CAMELS framework:

0= if the CAMELS framework is not in place for on site and off-site surveillence of banks.

1=if the CAMELS framework is in place for on site-and off-site surveillence of banks.

The above three dimensions of prudential regulations are summed and scaled as follows:

De-regulated=[0], less regulated=[1,2],moderately regulated=[3], largely regulated=[4], regulated=[5]

This summed up scale for each year is coded as follows:

De-regulated=[0], less regulated=[1],moderately regulated=[2], largely regulated=[3], regulated=[4]

VI- Pro-Competitive Measures(PRCOM):

Pro-competitive measures are scaled in terms of entry of foreign banks in the domestic market, entry of new domestic banks in the domestic market, restrictions on branching and involvement of banks in a wide range of activities.

1) Entry of foreign banks in the domestic market:

0=if there is a complete ban on the entry of new foreign banks in the domestic market.

1= if foreign bank entry is allowed but their operation is restricted to limited activities and also restrictions in terms of opening of branches.

2=if an easing of branching restriction accompanied with a wide range of activities in which foreign banks can engage in, or national treatment is accorded to foreign banks.

2) Entry of new domestic banks in the domestic market:

0=if the entry of new domestic bank is prohibited or strongly regulated.

1=if new domestic banks are allowed to enter in the market.

3) Restrictions on branching:

0=if there is a restriction on opening of new branches.

1=if there are no branching restrictions or restrictions are eased.

4) Other pro competitive measures:

0=if the banks are restricted only to a range of banking activities.

1=if the banks are allowed to become universal banks.

The above four dimensions of pro competitive measures are summed and scaled as follows:

Completely restricted=[0], highly restricted=[1], moderately restrictions=[2,3],weakly restricted=[4], fully liberalized=[5]

This summed up scale for each year is coded as follows:

Completely restricted=[0], highly restricted=[1], moderately restrictions=[2],weakly restricted=[3], fully liberalized=[4]

VII- Securities Market Development (SCR):

Securities market is scaled in terms of development of securities market along with an opening of the equity market to foreign investors.

1) Development of Securities markets:

0= if a securities market does not exist.

1= if a premature securities market with an introduction of auctioning of T-Bills or the establishment of security commission is in place.

2=if there is a progress in the development of securities markets such as introduction of long term govt. bonds, policies to develop corporate bond and equity market or introduction of a primary dealer system.

3=if further policy measures to develop derivative market, deregulate portfolio investment and pension funds or completely deregulating the stock exchange have taken place.

2) Opening of equity market to foreign investors:

0= if the country's equity market is not open to foreign investors.

1=if the country's equity market is open to foreign investors.

The above three dimensions of reserve requirement are summed and scaled as follows:

Completely restricted=[0], highly restricted=[1], moderately restricted=[2],weakly restricted=[3], fully liberalized=[4]

This summed up scale for each year is coded as follows:

Completely restricted=[0], highly restricted=[1], moderately restricted=[2],weakly restricted=[3], fully liberalized=[4]

Table A1: Domestic Financial Liberalization Policy Variables

Year	INR	CRD	RSRV	BNK	PRD	SCR	PRCOM
1972	0	0	1	0	0	0	1
1973	0	0	1	0	0	0	1
1974	0	0	1	0	0	0	1
1975	0	0	1	0	0	0	1
1976	0	0	1	0	0	0	1
1977	0	0	1	0	0	0	1
1978	0	0	1	0	0	0	1
1979	0	0	1	0	0	0	1

1980	0	0	1	0	0	0	1
1981	0	0	1	0	0	0	1
1982	0	0	1	0	0	0	1
1983	0	0	1	0	0	0	1
1984	0	0	1	0	0	0	1
1985	0	0	1	0	0	0	1
1986	0	0	1	0	0	0	1
1987	0	0	1	0	0	0	1
1988	0	0	1	0	0	1	1
1989	0	0	1	0	0	1	1
1990	0	0	1	0	0	1	1
1991	1	2	0	1	0	2	2
1992	1	3	0	1	0	2	2
1993	1	3	0	1	0	2	2
1994	1	3	0	1	1	2	2
1995	3	4	0	1	1	3	3
1996	3	4	1	1	1	3	3
1997	3	4	3	1	3	3	3
1998	4	4	3	1	3	3	3
1999	4	4	3	1	3	3	3
2000	4	4	3	2	3	3	3
2001	4	4	3	2	3	3	3
2002	4	4	3	2	3	3	3
2003	4	4	3	2	3	3	4
2004	4	4	3	3	3	4	4
2005	4	4	3	3	3	4	4
2006	4	4	3	3	4	4	4
2007	4	4	3	3	4	4	4
2008	4	4	3	3	4	4	4
2009	4	4	3	3	4	4	4
2010	4	4	3	3	4	4	4

APPENDIX 4

CODING RULES/ SCALE TO CONSTRUCT DATA SET OF EXTERNAL FINANCIAL LIBERALIZATION THROUGH DE JURE MEASURE[13]

External financial liberalization data set through De Jure measure has been constructed on the basis of measurement of capital account liberalization. Three important dimensions of capital account liberalization namely exchange rate system, restrictions on capital inflow and restrictions on capital outflow are scaled in terms of fully restricted to a completely free capital account. We assign a score on the scale showing liberalization of capital account from 0 to 5, with 0 showing complete restriction and 5 indicating fully liberalized. Between these extreme numbers, 1 refers to highly restricted, 2 represent moderately restricted, while 3 or 4 is for weakly restricted. The assigning of different codes and calculation of final score is explained in the following.

Capital account liberalization is scaled in terms of three dimensions of capital account openness namely exchange rate system, restriction on capital inflow and restriction on capital outflow.

Completely restricted=[0], Strongly restricted=[1], moderate restrictions=[2,],weakly restricted=[3,4],Fully liberalized=[5]

1) Exchange rate Regime:

0= when a special exchange rate regime such as fixed exchange rate for either capital or current account transactions exist

1=when the exchange rate is managed float

2= when exchange rate is freely floating or unified.

1) Restrictions on capital Inflow:

0= when significant restrictions in terms of foreign direct investment, portfolio

[13]These coding rules and scale for the measurement of capital account liberalization are constructed by following Quinn(1997),keeping in mind the special features of capital account liberalization process in Pakistan.

investment on capital inflows exists.

1= when significant restrictions in terms of foreign direct investment, portfolio investment on capital inflows does not exist.

2) Restriction on capital outflows:

0= when capital outflow is fully restricted

1=when capital outflow regarding FDI are not fully restricted, capital is allowed to flow freely or with minimal approval restrictions.

2= when capital outflow regarding portfolio investment are not fully restricted, capital is allowed to flow freely or with minimal approval restrictions.

The above three dimensions of capital account liberalization are summed and scaled as follows

Completely restricted=[0], highly restricted=[1], moderately restricted=[2],weakly restricted=[3,4], fully liberalized=[5]

This summed up scale for each year is coded as follows.

Completely restricted= [0], highly restricted= [1], moderately restricted [2], weakly restricted= [3,4], fully liberalized= [5]

Table A1 : Data Set of External Financial Liberalization through *De Jure* Measure

Year	Summed up scale	Final Coding
1972	0	0
1973	0	0
1974	0	0
1975	0	0
1976	0	0
1977	0	0
1978	0	0
1979	0	0
1980	0	0
1981	0	0

1982	1	1
1983	1	1
1984	1	1
1985	1	1
1986	1	1
1987	1	1
1988	1	1
1989	1	1
1990	1	1
1991	2	2
1992	2	2
1993	2	2
1994	2	2
1995	2	2
1996	2	2
1997	2	2
1998	1	1
1999	1	1
2000	2	2
2001	4	4
2002	4	4
2003	4	4
2004	4	4
2005	4	4
2006	4	4
2007	4	4
2008	4	4
2009	4	4
2010	4	4

APPENDIX 5

Table A1: Foreign assets position of Pakistan (Million US $)

Year	Portfolio equity assets	FDI assets	Debt assets (portfolio debt + other investment)	financial derivatives assets	FX Reserves minus gold	Total assets
1972	0	0	220	0	220.74	440.74
1973	0	7.40	308	0	412.03	727.43
1974	0	9.80	452	0	392.34	854.14
1975	0	23.90	494	0	340.28	858.18
1976	0	10.40	508.41	0	466.16	984.97
1977	0	22.10	529.72	0	448.86	1000.69
1978	0	20.50	507.09	0	407.70	935.29
1979	0	45.00	587.57	0	213.03	845.60
1980	0	40.20	604.62	0	495.82	1140.65
1981	0	52.35	592.34	0	721.50	1366.19
1982	0	64.61	605.43	0	968.52	1638.56
1983	0	77.87	615.30	0	1972.54	2665.70
1984	0	106.02	718.69	0	1035.48	1860.19
1985	0	126.57	797.42	0	807.45	1731.44
1986	0	150.20	996.58	0	709.06	1855.84
1987	0	196.94	1163.50	0	501.87	1862.31
1988	0	228.94	1351.91	0	394.59	1975.44
1989	0	224.25	1551.99	0	520.54	2296.78
1990	0	244.95	1916.57	0	295.91	2457.44
1991	0	233.58	2226.88	0	526.52	2986.98
1992	0	248.80	2794.80	0	850.19	3893.80
1993	0	240.61	3080.98	0	1196.80	4518.39
1994	0	266.92	3364.48	0	2929.40	6560.80
1995	16.25	266.19	3560.11	0	1732.81	5575.36

1996	43.75	264.03	3723.88	0	548.29	4579.94
1997	86.25	277.18	3745.25	0	1194.84	5303.52
1998	162.50	329.90	3701.25	0	1028.00	5221.65
1999	273.75	414.10	4224.25	0	1511.37	6423.47
2000	232.47	488.70	4661.25	0	1513.35	6895.77
2001	192.34	577.60	4608.25	0	3640.03	9018.22
2002	152.89	658.30	4672.25	0	8078.29	13561.73
2003	203.61	604	5214.25	0	10940.97	16962.83
2004	220.79	702	6553.24	0	9799.03	17275.05
2005	447.00	870	6427.24	0	10032.83	17777.07
2006	535.32	1010	6669.24	0	11543.12	19757.67
2007	581.84	1002	6775.24	0	14044.02	22403.10
2008	358.88	1269	8198.73	0	7194.23	17020.84
2009	377.02	2051	8731.05	27	11318.20	22504.27
2010	423.09	1727	8584.23	20	14345.90	25100.22

Source: Lane and Ferretti uptill 2007, Author's calculation for 2008-2010

Table A2: Foreign Liabilities position of Pakistan (Million US $)

Year	Portfolio equity liabilities	FDI liabilities	Debt liabilities (portfolio debt + other investment)	financial derivatives liabilities	Total liabilities
1972	0	201.55	4072.13	0	4273.67
1973	0	280.85	4566.91	0	4847.76
1974	0	305.47	5121.33	0	5426.80
1975	0	347.44	5752.86	0	6100.31
1976	0	370.68	6802.36	0	7173.04
1977	0	386.17	7564.13	0	7950.30
1978	0	406.51	8329.30	0	8735.81
1979	0	450.16	8918.88	0	9369.04
1980	0	527.96	9931.19	0	10459.15
1981	0	643.52	10580.54	0	11224.06
1982	0	559.85	11704.00	0	12263.84
1983	0	588.24	12026.22	0	12614.46
1984	7.28	570.72	12227.98	0	12805.99
1985	26.96	687.83	13464.89	0	14179.69
1986	33.64	766.54	14954.40	0	15754.58

1987	71.35	890.85	16797.66	0	17759.86
1988	80.55	1074.01	17065.16	0	18219.72
1989	78.05	1156.53	18348.19	0	19582.77
1990	82.07	1461.11	20663.38	0	22206.56
1991	296.46	1621.93	23363.32	0	25281.71
1992	465.80	2010.38	24917.89	0	27394.08
1993	1098.34	2201.17	24546.39	0	27845.90
1994	2125.84	2827.73	27382.73	0	32336.30
1995	1320.29	3460.28	30228.71	0	35009.28
1996	1293.97	4117.53	29828.67	0	35240.17
1997	1928.08	4710.36	30073.23	0	36711.66
1998	745.33	5243.45	32261.29	0	38250.07
1999	1140.32	5198.31	33889.62	0	40228.24
2000	1017.43	5025.20	32781.11	0	38823.74
2001	552.34	5189.21	31654.83	0	37396.39
2002	1340.69	6283.71	33585.61	0	41210.02
2003	1727.33	7195	36764.96	0	45687.29
2004	1928.08	7606	37231.93	0	46766.01
2005	3557.48	10209	35933.20	0	49699.67
2006	4539.01	13682	39712.27	0	57933.28

2007	7349.57	25621	44093.33	0	77063.89
2008	2921.00	31059	59296.70	0	93276.70
2009	4624.61	26929	65507.87	57	97118.48
2010	6126.91	21494	67010.38	51	94682.29

Source: Lane and Ferretti uptill 2007, Author's calculation for 2008-2010

Table A3 : Gross stock of assets and liabilities

Year	Total assets	Total liabilities	sum of total assets and liabilities(Million US $)	Sum of total assets and liabilities (Million Rs.)	Gross stock of assets and liabilities as a ratio to GDP
1972	440.74	4273.67	4714.41	52004.67	0.962
1973	727.43	4847.76	5575.19	55194.34	0.825
1974	854.14	5426.80	6280.94	62181.29	0.716
1975	858.18	6100.31	6958.49	68889.03	0.620
1976	984.97	7173.04	8158.01	80764.30	0.620
1977	1000.69	7950.30	8950.99	88614.79	0.592
1978	935.29	8735.81	9671.09	95743.84	0.543
1979	845.60	9369.04	10214.64	101124.90	0.519
1980	1140.65	10459.15	11599.80	114838.03	0.490
1981	1366.19	11224.06	12590.25	124643.52	0.448
1982	1638.56	12263.84	13902.40	178506.87	0.551
1983	2665.70	12614.46	15280.16	206282.14	0.566
1984	1860.19	12805.99	14666.17	225272.38	0.537
1985	1731.44	14179.69	15911.13	254259.86	0.539
1986	1855.84	15754.58	17610.42	303779.76	0.590

1987	1862.31	17759.86	19622.17	342406.95	0.598
1988	1975.44	18219.72	20195.17	376639.84	0.558
1989	2296.78	19582.77	21879.55	468659.90	0.610
1990	2457.44	22206.56	24663.99	540141.47	0.633
1991	2986.98	25281.71	28268.69	698802.09	0.687
1992	3893.80	27394.08	31287.88	804098.39	0.667
1993	4518.39	27845.90	32364.29	974812.56	0.731
1994	6560.80	32336.30	38897.10	1198030.58	0.767
1995	5575.36	35009.28	40584.64	1390024.00	0.745
1996	4579.94	35240.17	39820.11	1597582.75	0.754
1997	5303.52	36711.66	42015.18	1850768.90	0.762
1998	5221.65	38250.07	43471.72	1994713.00	0.745
1999	6423.47	40228.24	46651.71	2415840.28	0.822
2000	6895.77	38823.74	45719.51	2653066.59	0.693
2001	9018.22	37396.39	46414.60	2824969.06	0.671
2002	13561.73	41210.02	54771.74	3206003.70	0.720
2003	16962.83	45687.29	62650.12	3584526.63	0.735
2004	17275.05	46766.01	64041.07	3786364.04	0.671
2005	17777.07	49699.67	67476.74	4037126.75	0.621
2006	19757.67	57933.28	77690.95	4732792.87	0.621
2007	22403.10	77063.89	99466.99	6089438.95	0.702
2008	17020.84	93276.70	110297.54	8724315.17	0.852
2009	22504.27	97118.48	119622.75	10079819.52	0.791
2010	25100.22	94682.29	119782.51	10266654.6	0.700

Source: Lane and Ferretti uptill 2007, Author's calculation for 2008-2010