EFFECT OF FINANCIAL LIBERALIZATION AND BANK RISK TAKING IN PAKISTAN

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CERTIFICATE

This is to certify that this thesis entitled: **"Effect of Financial Liberalization and Bank Risk Taking in Pakistan"** submitted by **Ms. Mehreen Iftikhar** is accepted in its present form by the School of Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Economics and Finance.

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I, **Mehreen Iftikhar** hereby state that my MPHIL thesis titled **Effect of Financial Liberalization and Bank Risk Taking in Pakistan** is my own work and has not been submitted previously by me for taking any degree from the Pakistan Institute of Development Economics or anywhere else in the country/world.

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ABSTRACT

The study attempts to examine the impact of financial sector liberalization and the banking sector in Pakistan by using panel econometric analysis over the period of 2011-2020. The first-panel unit root of Haris T-Zavalis and Lm-Pesaran were used in the study to check the stationarity of the study. Then the study uses panel techniques of Hausman tests, fixed effect and random effect models for the empirical analysis. The study uses of 26 banks including commercial banks, Islamic banks in which separate panel are created. First, we check the panel of all 26 banks and found that there is negative association between financial liberalization with bank risk taking for the country of Pakistan. Secondly panel of commercial banks check again we found a negative link between financial liberalization and bank risk. Thirdly panel of Islamic banks is checked and the estimation shows that financial liberalization has a negative relationship with bank risk taking.

The financial sector liberalizations in Pakistan started with the reforms of macroeconomic structural adjustment programs, particularly by the end of the 1980s. The study's findings also show that financial liberalizations and bank risk in Pakistan have negative relationships. The outcomes finding of our studies are also in accordance with a few other research that have been reported in the literature. Finally, it is determined that more arrangements must be taken in order to stabilize Pakistan's financial system's performance via political stability and sound governance. It is vital to strengthen the State Bank's capability for supervision and prudential rules.

Key words: Financial liberalization, Bank risk-taking, Bank characteristics and macroeconomics variables.

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Chapter 1

Introduction

1.1 Introduction

The term financial liberalization (FL) can be best defined as "Financial freedom to travel in and out of the country in its whole, full currency convertibility (microtransactions), interest rate liberalization, liquidity management rules, and resource restrictions should be reduced." Limitations imposed by the government are being reduced while bank risk is the banks use the risk asset-to-total-asset ratio (denoted as risk assets) and the non-performing loan to total asset ratio.

The benefit of financial liberalization to technologically advanced countries is of motivating more competition in banks, which further promotes risk-taking motives; on the other hand, it, intensifies bank risk in emerging countries by increasing risk-taking opportunities. Financial liberalization improves the banking system's efficiency, which results in more savings, investment, and growth. According to Henry (2000) and Bekaert et aet al.05), previous research on financial liberalization and development explored that growth in the long run and economic development is improved by economic liberalization.

The purpose of financial liberalization is to enhance the allocation of resources, furthermore, it also encourages economic growth with the help of rising competition and bringing more innovation Schumpeter (1911); Robinson (1952) Debreu (1951);Koopmans (1951). In addition to that financial liberalization contains the ability to make the banking sector more advantageous through bringing more competition, making the banking rules more complex,

implementing financial products and services ,and raising the overall effectiveness of the banks to the next level. Back in the 1990s, the government of Pakistan just like other emerging countries initiates financial sector liberalization as part of broader socioeconomic structural adjustment efforts. As a result, in a short tenure, most of the state's financial sectors as well as trade, and industrial reforms comes under the control of the private sector from public sector. Far reaching steps towards financial liberalization like macroeconomic factors, clearing house volumes, private sector credit as a share of the GDP, total bank deposit liabilities were on an increasing trend since the selection of financial liberalization laws.

By taking financial liberalization into account bank takes a higher risk by altering bank competition as a result of changes in administration, institution, and policy of the banks within the nation. Because of bad governance of the state, political instability that exist, and many other factors, the policies to bring the institutions into the private zone from public control along with the reforms related to the finance and banking sectors were not able to arouse the economic growth in the 1990s. Till the late 1990s, there exist an environment of uncertainty for both long term and short-term investors due to double digit inflation rate.

1.2 Statement of the Problem

Apart from a significant increase in foreign private capital inflows, the primary cause of this crisis was a lack of proper supervisory and regulatory standards in the banking system (short-time debts). However, given the financial system's relative stability in recent years, a new sort of competition has evolved between banks that make loans to individuals and small businesses. As the number of bank loans in these regions expands, banks become more sensitive

to the risks of shocks on macroeconomic factors. These factors might have an indirect or direct influence on bank risk and transitional function. As a consequence, regulators and bankers are always worried about financial liberalization and looking for tools to assist banks in better managing their bank risk.

1.3 Research problem

In the early 1990s, Pakistan, like other developing nations, began financial sector deregulation as part of wider macroeconomic structural adjustment efforts. In a short period of time, Pakistan effectively shifted a major portion of the banking sector from public to private control, as well as several other financial, trade, and industrial policy actions. Broad money, total bank deposit liabilities, clearing house, currency, and private sector credit as a percentage of GDP have all shown an increasing trend since the introduction of financial liberalization legislation. So far, several theoretical and empirical research (Haque and Nadeem, 1997; Khan and Arshad, 2003;) on financial sector changes and their impacts in Pakistan have been conducted. However, the majority of analyses are essentially descriptive in nature, and the majority have issues with little data and omitted variables bias. Nonetheless, the current article attempts to fill this gap in the literature by using the most recent available data and integrating new factors on financial liberalization in a time series multivariate model.

1.4 Significant of the study

The purpose of the study is to investigate the effect of financial liberalization on bank risk taking the case of Pakistan. The first aspect is the use of multiple indicators of financial liberalization as well as bank risk taking analyses to highlight the ambiguous relationship

between financial liberalization and bank risk taking. As a consequence, the study reveals that varying degrees of financial liberalization contribute to the emergence of contrarian advantages in emerging economies like as Pakistan. Second, in addition to adding to the literature review, the current study results educate regulators and policymakers on policy implications. For example, if financial liberalization has a positive impact, the government may loosen restrictions on foreign equity participation to maintain market efficiency by boosting the quality of public information, particularly in emerging markets. The effect of financial liberalization on trading strategy results is also important to consider. Portfolio managers should think about since different trading strategies provide greater or lower returns. Distinct degrees of financial liberalization might offer them with different evaluation matrices to change their total portfolio risk and return attributes.

1.5 Theoretical rationale of the study

The study is based on the effect of financial liberalization on bank risk-taking in Pakistan. Transaction costs and asymmetric information are the foundations of conventional theories of intermediation. They are made to account for organizations that accept deposits, issue insurance policies, and distribute money to businesses. However, there have been significant developments in recent decades. Intermediation has grown even though transaction costs and asymmetric information have decreased. Instead of being marketplaces for individuals or businesses, new markets for financial futures and options are primary markets for intermediaries. Financial liberalization increases financial intermediation. According to McKinnon and Shaw, financial liberalization refers to the imposition of higher interest rates that balance the supply and demand for savings. According to the two writers, higher interest rates will enhance savings and financial intermediation, and improve the effectiveness of utilizing savings.

1.6 Limitation of the study

The current research has tried to cover several important criteria in ensuring the effect of financial liberalization on bank risk taking for the country Pakistan. However, the research has certain limitations for the same. As the research was based on one of the individual country Pakistan, therefore the financial liberalization effect on bank risk taking were only considered in this research. Since there was an issue of time constraint in this research, more country could not be check with the present case as highlighted. Moreover, the research was based on certain budget issues which limited the diversification criteria in conducting the research. Any cross-border country checking could not be carried out in this research. Therefore, these are some of the limitations associated with this research. However, the other aspects of the research have been carefully formulated in order to predict probable reasons about the effect of financial liberalization on bank risk taking.

1.7 Research questions

The empirical analysis of the present study is based on these key questions.

1. How does financial liberalization affect bank risk-taking for Pakistan?
2. Does bank specific characteristics effect bank risk taking in Pakistan?
3. Does macroeconomics variables effect bank risk taking in Pakistan?

1.8 Objective of the study

The study analysis consists of two parts. In the first, the study analyzes the financial liberalization index of Pakistan. In the second part, the study analyzes bank risk-taking and macroeconomic variables by using an appropriate econometric technique by addressing the following objectives.

1. To investigate the influence of financial liberalization on bank risk-taking for panel of all banks in Pakistan.
2. To determine the effect of bank-specific characteristics on bank risk-taking in Pakistan.
3. To check the relevance and importance of macroeconomic variables and their effect on bank risk taking in Pakistan.
4. To emphasize the qualitative analysis of bank characteristics and financial liberalization on bank risk.

1.8 Research Gap

Accordingly, the nominal interest rate of country like Pakistan have remained all-time high. Pakistan's nominal interest rates have remained high. But soon after this time in the late 1990s, and the early 2000s, the entire economic and financial indicators began to make improvement. Hence, the previous research work which determine the linkage of financial liberalization and bank risk taking gives mixed results which thus makes the links between these two variables uncertain. Due to this reason, it becomes a major concern both for policy makers and researchers to investigates the relationship between the financial liberalization and bank risk taking. In order to fill out the gap and to make the results clear this study is an attempt to explore the links between financial liberalization and bank risk taking for the case of Pakistan.

1.9 Organization of the study

The rest of the study is structured as follows. Chapter 2 highlights the literature review, and Chapter 3 discusses the data and methodology used to estimate the financial liberalization index and bank risk-taking, selection of variables and highlights the econometric model and

different techniques, chapter 4 explain result and discussion and chapter 5 highlights conclusion and policy recommendations.

Chapter 2

Literature review

2.1 Introduction

This study examines the association of bank risk taking, financial liberalization and other variables on the quality of financial institutions. In this regards our research work considers financial liberalization as a dependent variable which is the most comprehensive measures for the quality of a financial institutions. Bank risk-taking is measured by risk determine as a percentage of the total assets (risk assets) and non-performing loans as a percentage of total loans (non-performing loans) (denoted as non-performing loans). Your investment may become worthless if the price falls. This is the danger of the stock market. Any change in financial markets makes the investment done by banks susceptible. As a result, banks and their clients own more financial assets like stocks and bonds. Extensive literature has been found on bank risk taking and the factors that affect it. However, the association of financial liberalization and bank risk taking has been relatively less explored. Therefore, this study is going to investigate the nexus between financial liberalization and bank risk for the case of Pakistan.

2.2 Empirical Literature

The study focuses on the previous studies in which most of the literature that exist on the linkage between financial liberalization and bank risk taking gives mixed results. Some research studies show a positive response on bank risk taking from financial liberalizations while others determine an indirect correlation. There are several others studies which reveal a bidirectional and non-linear association of financial liberalization and bank risk- taking. Taking critical perspective

into account we must states that financial liberalization leads the way to too much bank risk-taking. Interest rate liberalization means that the interest rate is determined by the market itself not by the central bank which makes the lending rate more volatile and creates a greater credit risk for the banks. Second, excessive competitiveness leads to a drop in the bank's net interest margin, according to Berger, Klapper and Turk-Ariss, (2009) "competition-fragility" idea. Over time, this will lower bank profits and drive "search for yield" behavior. Third, banks are more prone to expand into unconventional companies and engage in speculative activities in the absence of adequate supervision and regulation Barth et al, (2013). Fourth, because risk in the international market may be transferred to the local market via bank funding, financial integration encourages banks to take more risks (Giannetti and Ongena, (2012).

2.3 Empirical evidence for financial liberalization

The literature shows that many developing nations began financial liberalization in the early 1980s, few studies have evaluated the impact of financial liberalization and the efficiency and productivity of banks in these countries. According to this study, financial liberalization promotes bank performance and effectiveness by establishing a dynamic and banks, on the other hand, have full authority over their activities in a flexible environment. For instance, Banks are now able to establish their own interest rates as previously set by the government's financial assets. There is a wide range of empirical evidence on how liberalization influences bank efficiency.

Zaim et al, (1995) examine the impact of financial liberalization on the operation of Turkish commercial banks in 1981 (pre-liberalization) and 1990 (after liberalization) (post-liberalization). In 1990, he discovered that productivity was at an all-time high. 1981's figure was higher. He did not, however, address the question of whether the production boundary has been

crossed. If the typical Turkish bank has grown capable of producing more or fewer outputs from the same quantity of inputs (technological development or regress); inputs (increased or decreased productivity); or whether the banks' closeness to the current is a factor. Previous boundaries have grown or shrunk (efficiency increase or decrease) within the context of a more liberal atmosphere.

Gruben et al, (2003) investigate the impact of financial liberalization on market power and bank risk taking from the year of 1991 to 1997, and they showed that not all financial liberalizations are linked by problems, and banking institutions without macroeconomic stability are more likely to suffer adverse implications. Because every economic growth development is individual, empirical findings based on global research frequently lack focused policy guidelines.

Isik and Hassan, (2003) look at how Turkish banks' total factor productivity changed from 1981 to 1990 as a result of financial sector liberalization. Their findings show that after financial deregulation, Turkish banks' performance improves significantly. However, Denier et al, (2007) who look at Turkish banking efficiency from 1970 to 1994, conclude that it has decreased. Frank Westermann et al, (2006) determine the link of financial liberalization on economic growth. He found that there is a direct connection between financial liberalization and the indirect effect of increasing tendency. This study also explores several financial liberalizations with growth models whose predictions match our empirical findings.

Betty and Jones, (2006) examine that financial liberalization is frequently associated with financial tragedies. The association has empirically recognized weekend make banking systems, which is a mainly static explanation. The Dynamic explanation is established in this study by stimulating the advancement of recent risk-taking of bank possibilities which is liberalized and incentives through time. Although if a banking system is well- calculated for long-term qualities,

the model shows that many countries would experience an early date of fast, low-risk expansion before entering a date with a higher risk of the banking crisis. The point of international rivalry, the minimal product of investment, and the bank's disposable value all grow at the same time, resulting in this shift.

According to Amine Tarazi et al, (2007) the growing framework of the European banking sector, the link between bank risk and product diversity by using data from a large number of European banks from 1996 to 2002. They conclude that bank growing into non-interest profit industries run a larger chance of failure and instability than banks that primarily provide loans. However, when size effects are taken into account, and non-interest activities are separated into trading and commission and fee activities, we find that the positive risk correlation is generally correct for small banks, and that commission and fee activities are mostly responsible. A greater percentage of trading operations is never connected with increased risk, and for small banks, it can require less asset and debt risks in some situations.

Chaudhry et al, (2007) investigate the association of financial liberalization on macroeconomic presentation in Pakistan from 1972 to 2006. For empirical analysis, the study used bivariate and multivariate models. Financial sector liberalization in Pakistan began with macroeconomic structural adjustment programmed reforms, particularly by the end of the 1980s. The findings imply that financial liberalization variables have a strong favorable impact on economic development and investment. This study's findings also show that financial liberalization indicators and economic development and investment have short-term as well as the long-term link in Pakistan. The findings are also in line with those of several other research detailed in the literature. Finally, it is determined that additional measures must be taken to stabilize the functioning of Pakistan's financial sector through political stability and good governance.

Choudhry and Jakob, (2009) investigate the impact of various aspects of financial liberalization on the risk of systemic and unsystematic banking crises. Our nonlinear fixed-effect modeling results, based on innovative financial liberalization procedures for a random a selection of developed and emerging nations from 1973 to 2002, suggest that such aspects of financial liberalization certainly decrease the incidence of times of financial crisis, issue to strong banking supervision. These results have proven to be quite strong in a variety of sensitivity testing.

Clas Wihlborg et al, (2010) determine that financial liberalization improves financial crisis risk. He examines the risk of the financial crisis occurring after a level of liberalization that is immediate by focusing on banking crises. The study finds an inverted U-shaped link between liberalization and the chance of a crisis that used a new improved dataset, we analyzed financial developments in 48 nations from 1973 and 2005. When country institutional traits and dynamic consequences of liberalization are considered, the study question if the relationship still exists. The findings evaluate that financial liberalization and banking crises have significant associations due to the degree of capital parameter and administration. The likelihood of a financial crisis rises with liberalization when regulation and supervision are weak, but this relationship reverses when regulation and oversight tighten.

Niels and Nhung, (2010) explore the relation of bank efficiency by using taking of 400 bank-year of ten emerging economies from the year 1991 to 2000. For single bank- level data Employment analysis (DEA) was employed to find bank efficiency. The study used panel least square and fixed-effects model, to determine bank efficiency and to investigate the link between financial liberalization and bank efficiency. Overall, we find significant evidence that financial liberalization programs improve bank efficiency.

Hou et al, (2014) determine the effect of ownership structure and bank risk taking for china. Their studies suggest that government-controlled banks (GCBs) assume bigger risks than government enterprises-controlled banks or investment firms. This is due to excessive government interference and a lack of incentives for GCBs to implement prudent bank internal control. The outcomes are even more significant among banks with concentrated ownership, mainly because the large directing power aids in management monitoring and promote responsible operating procedures. Our findings are significant for the Chinese banking sector's continuing reforms.

Nafis Alam, (2014) examines the connections between the banking monitoring and controlling systems connected with Basel III's supports and bank risk-taking. The study used administrative control, investment requirement, private monitoring, and restriction on bank activities regulation were applied to set theoretical priors. The study focuses on the dual banking system from 2006 to 2010. Higher capital requirements appear to reduce risky behavior in both conventional and Islamic banks, according to our findings. Higher limits on bank activities had the reverse impact; bank risk-taking behavior for conventional banks and the risks of Islamic were reduced. Furthermore, government regulatory competence has a slight negative impact on the risk-taking activity of both Conventional and Islamic banks.

Glauco et al, (2017) examine a gross connection of financial liberalization and banks total factor productivity growth is determined by a direct link of financial liberalization on bank as a whole sustainability manufacturing output and just a negatively correlated of managing by larger willingness to system bank risk. The empirical segmentation conducted based on a survey of 1,530 banking institutions in 88 countries from 1999 to 2011. Financial liberalization has a net direct relationship with total factor productivity growth, according to the study's findings: the

direct positive effect dominates the negative effect. The significance of these results for policy are significant.

Rui wang et al, (2017) investigate if the presence of foreign banks in emerging economies has an influence on the incidence of domestic banks. They find considerable evidence that the risk of local banks increases with the presence of foreign banks in the host economy by evaluating bank- level data from 35 markets from 2000 to 2014, and this finding is supported by numerous robustness tests. They also found that these kinds of effects are more common in domestic banks that are less efficient and rely on conventional operations. When foreign banks enter the host market through M&A rather than Greenfield investments, and when they are part of multinational conglomerates with strong internal backing, they have a greater impact on local banks' risk operations. Foreign banks have a stronger influence on local bank risk when they join the host market through M&A rather than direct investment, and when they are part of foreign corporations with strong internal support.

Rui and Luo, (2019) evaluate the influence of financial liberalization on bank risk-taking that uses data from 169 Chinese banks from 2000 to 2014 from the source of Dijk's Bank scope database and banks' annual reports for the country of China. They conclude that rising financial liberalization development will increase bank stability and that a bad microenvironment will reduce economic growth, resulting in lower laws and rules, which will negatively affect bank risk-taking.

Pejman et al, (2020) explore the association of female boar representation bank risk-taking and performance according to his studies if the number of female directorships in Islamic financial institutions is much reduced than in retail banks, and, more significantly, how different is the management of Islamic banks with female directors compared to standard banks. We

discovered that Islamic banks have somewhat less female executives on their boards than conventional banks and that the hiring of directorships had no effect on the efficiency. Our analysis shows that, even within highly sensitive institutions of Islamic banks, gender parity and establishing an integration strategy has no negative impact on productivity.

Reigl et al (2020) evaluates empirically the potential nonlinear link between bank risk and competition for a sample of commercial Banking in the Baltic states from 2000 to 2014. The Lerner index and market share are two other indices used to gauge competition, and the Z-score and loan loss reserves are used as stand-ins for bank risk. We find that competitiveness and financial stability have an inverse U-shaped connection, which is consistent with the theoretical predictions. In turn, this indicates that, above a certain point, a lack of competition is likely to make banks take more risks individually, which could be bad for the stability of the Baltic countries' banking industry.

Abid et al (2021) examine the effects of the Chief Risk Officer and the risk committee on the risk-taking tendencies of Asian commercial banks in the wake of the global financial crisis. We demonstrate evidence of a trend using a sample of 1480 observations representing 185 banks spanning the years 2010 to 2017. There is a clear and negative correlation between risk-taking and risk governance methods. However, compared to state-controlled banks, this relationship is more pronounced for privately owned banks (POBs) (SOBs). Additionally, risk governance practices have a beneficial effect on POB performance but have no effect on SOB performance.

Dinh Su et al (2021) investigates the asymmetric effects of monetary policy and business cycles on bank risk-taking. The results suggest that the effects of monetary policy and macroeconomic variations are dependent on bank-specific features over the period of 2009–2019 using a sample of 212 banks in 13 rising Asian economies. Our study has demonstrated the

procyclicality of bank risk-taking. Banks are more risky during recession cycles and more stable during boom cycles. The effects of economic upswings and downswings also depend on characteristics unique to banks, such as size, liquidity, and capitalization. We gave more proof that banks' size, capitalization, efficiency, and diversity are crucial factors in minimizing the negative effects of an expansionary monetary policy on bank risk-taking. Discussions of policy are also included.

2.4 Financial liberalization, Efficiency and Bank crises

Eichengreen and Arteta, (2002) distinguish between the consequences of internal and external financial liberalization, building on the work of Demirguc-Kunt and Detragiache. A 0/1 dummy takes care of the latter. They have discovered. Liberalization of the capital account does not cause a banking crisis, but it does contribute to it. Internal financial liberalization has the potential to do so. They also discover that money is available. Account liberalization makes countries more vulnerable to bankruptcies while, internal liberalization. Noy (2004) examines the interplay between domestic and international actors. It finds that banking crises emerge as a result of financial liberalization and supervision. Following deregulation, there was a lack of supervision.

According to Beim and Calomiris, (2000) Financial restriction reduces economic growth since banks have little motivation to seek new prospects and become inventive. Financial liberalization on both the external and internal fronts tends to improve financial infrastructure and bank governance.

Mehrez and Kaufmann (2000) investigate how the potential of a financial crisis increases when there is a lack of honesty (or "transparency"). Using multivariate probit modelling for 56 countries from 1977 to 1997, they discover a greater likelihood of a crisis occurring after financial liberalization in the next five years. Furthermore, they discover that nations with low openness have a larger risk of a crisis than those with high transparency. They present their own dates for financial liberalization and use these dates to create their liberalizations index between 1970 and mid-1995. Kaminsky and Reinhart (1999) examined 76 currency crises and 26 banking crises in 20 nations. Financial liberalization frequently precedes banking crises, according to one of their primary results. Two-year delayed domestic credit growth is their proxy for financial liberalization.

Barth et al, (2004) concentrate on banking activity constraints, entrance restrictions, and privatization. They discover that limits on banking activity and foreign bank entry raise the risk of a banking crisis, whereas government ownership has no influence. Barth and colleagues utilize data from their country survey, The Regulation and Supervision of Banks around the World: A New Database, to determine the types of regulatory limits on banks. Although these variables capture the scope of regulatory constraints across nations, they are only available as cross-sectional data for 1999, 2003, and 2007.

Ranciere et al. (2006) use two proxies to examine the association between financial liberalization and crises: one for equity market liberalization and the other for capital account liberalization. Higher probability of banking and currency crises (twin crises) are linked to both financial liberalization variables. Beck et al, (2006). investigates the influence of national bank concentration, bank laws, and national agencies on the risk of systemic banking crises in a country. They conclude that economies with more concentrated banking systems are less likely

to experience crises, based on data from 1980 to 1997 for 69 nations. Furthermore, they discover that anti-competition regulatory policies and structures are linked to increased banking sector instability.

According to Abiad et al, (2008) there are seven aspects to the amount to which the financial sector has been liberalized, which are rated on a scale of 3 (totally liberalized) to 0 (completely liberalized) (not liberalized). The database has the benefit of allowing policy reversals, in addition to discriminating between different characteristics of financial liberalization. Credit restrictions and excessively high reserve requirements (hence referred to as credit controls) are the first dimension of liberalization, focused on the presence of specified credit limits or floors, as well as the amount of reserve requirements. The second part looks at the rules governing interest rates, including whether they are controlled by the government and whether there are any floors, ceilings, or bands in place. The fourth component relates to state ownership in the banking sector, or the proportion of assets in the sector that are under the control of state-owned organizations. Capital account limitations and other constraints on foreign capital movements are the fifth dimension. The sixth component encompasses banking sector prudential rules and supervision, including Basel standards compliance and executive control over the banking regulatory body. The last pillar is securities market policy, which includes government bond auctions, debt and stock market development, and international investor access.

Fatima Farooq et al, (2012) explores the influence of financial sector liberalization on macroeconomic performance in Pakistan Using time series econometric analysis, from 1972 to 2006. For empirical analysis, the study used bivariate and multivariate models. Financial sector liberalization in Pakistan began with macroeconomic structural adjustment programmed changes,

particularly towards the end of the 1980s. The findings imply that financial liberalization variables have a strong favorable influence on economic development and investment. This study's findings also show that there is both long-run and short-run cointegration of financial liberalization indices and economic development as well as investment in Pakistan.

2.5 Theoretical background of financial liberalization and bank risk taking

Goldsmith (1969) determines an empirical analysis of 35 industrialized and developing nations, and concluded that financial ratios are positively connected with actual income and wealth. His findings matched Gurley and Shaw's theoretical methodology. Claessens and Laeven (2004) shows that Banking systems with greater foreign bank entrance and fewer entry and activity limitations, are more competitive. As a result, if financial deregulation boosts bank competitiveness, banks will be more inclined to take risks. Boyd and De Nicol, (2005). investigate how increased market dominance in the loan market may lead to higher bank risk since higher interest rates charged to borrowers make it more difficult to repay loans and increase their moral hazard incentives to engage in riskier activities.

Berger et al. (2009) illustrate that the two strands of literature do not have to provide contradictory predictions. If banks have a larger franchise value as a result of their market position, they can use more equity capital or other risk-mitigation strategies to protect it from higher loan risk. They discover that, contrary to the "competition-fragility concept," banks with more market power have lower total risk exposure in a sample of industrialized countries, despite the fact that market dominance increases loan risk. Martnez-Miera and Repullo (2010) suggest that competitiveness and bank risk have a non-linear connection. In highly concentrated markets, more competition lowers the chance of bank collapse; but, in highly competitive markets, it raises it.

González and Elena, (2013) examine that in a worldwide sample of 4333 institutions from 83 countries, financial liberalization has an impact on bank risk-taking. Financial liberalization boosts bank risk-taking in both rich and developing nations, but through distinct mechanisms, according to our findings. In industrialized countries, financial deregulation encourages increased bank rivalry, which raises risk-taking incentives. In developed nations, it reduces bank risk by widening risk-taking chances, but in underdeveloped countries, it raises bank risk by increasing risk-taking opportunities.

According to Levine, (2003) powerful official supervisors might strengthen bank governance and encourage competition. Indeed, we have proven that when banks face increased competition, they may be forced to take on additional risks. In this regard, a competent and independent supervisor would be able to prevent managers from taking too many risks. This isn't always the case, especially in developing countries. Financial liberalization usually includes measures such as lowering entrance barriers for foreigners. Some feel that foreign banks' cutting-edge technology and extensive expertise contribute to the development and stability of the financial system in the host nation (Wu, Chen, Jeon, and Wang (2017)). Furthermore, due to availability of foreign banks may encourage indigenous banks to compete. As a result, domestic banks can raise their knowledge of care of credit risk and concentration on enhancing risk management skills, lowering risk-taking Lensink and Hermes (2004) ; Levine (2001).

Gruner and Fecht, (2012) examine the financial integration, specialization and systematic risk from the year of 2001 to 2008 and found that Sectoral and aggregate domestic shocks might affect banks. They will be able to share these risks in a comprehensive interbank market after they have integrated. When banks have a comparative advantage in lending to particular industries, financial intermediation may encourage banks to focus on lending in those areas.

Increased loan concentration does not always result in higher risk since a healthy interbank market allows for the necessary diversification. However, the increased demand for risk pooling raises the danger of cross-border contagion and the possibility of global financial crises. Even if integration raises the risk of contagion, it enhances welfare by allowing banks to reap the benefits of specialization.

2.6 Financial Liberalization in Pakistan

Reforms in the financial industry after adopting policies of financial repression On the recommendation of the IMF and the World Bank, Pakistan took the initiative of financial liberalization in the late 1980s, creating market by M&A then instead of general partnerships, especially when they are part of international firms with considerable internal backing. Since the 1990s, financial liberalization initiatives have been employed extensively in emerging and developing economies. They've become an important aspect of the Washington consensus, and they've been included in several IMF and World Bank reform initiatives. The goal of financial liberalization programs is to remove government control and intervention from an economy's financial system. Such financial repression policies have a negative impact on the effectiveness of banks and other financial organizations that may transfer funds from savers to investors (McKinnon, 1973; Shaw, 1973), as they substantially impede the price mechanism and competition.

Samina and Mahmood, (2019) explore the indigenous aspects of Pakistan's financial liberalization process and create a domestic financial liberalization index that includes the most essential facets of the transition. By using multivariate co-integration method and error-correction technique, the findings show that the index has a positive long-run effects on the economy while develop a negative short-run influence. The importance of additional financial

depth and financial intermediation in a favorable environment, according to empirical data, are critical components for successfully implementing reforms for growth stimulation.

Risk-taking by banks and the development of the financial industry are inextricably linked. Indeed, a strong and efficient financial sector is essential for any economy's financial development and improvement of people's living standards. Because the banking industry accounts for 95% of Pakistan's financial sector, a strong banking sector is directly linked to bank risk taking and development. Hussain, (2006) indeed, the banking industry is at the core of Pakistan's financial sector, and it serves as the country's backbone, providing financial resources for industries, trade, and commerce. There was no central bank in Pakistan at the time of the country's independence. In Pakistan, just one bank, Habib Bank Limited (HBL), which was founded in Bombay in 1941, was inherited. Its headquarters were relocated from Bombay to Karachi when the subcontinent was partitioned. The National Bank of Pakistan, which is entirely controlled by the government, was founded in 1947.

The State Bank of Pakistan was established as the country's central bank on July 1, 1948. It was once jointly owned by the government and the private sector. SBP was tasked with resurrecting a banking system that had collapsed after partition, as well as recovering funds from India's central bank, which were jointly owned by India and Pakistan. The SBP was in charge of regulating and monitoring the banking system, as well as controlling the flow of cash and notes in the country and acting as a lender of last resort. The SBP encouraged banks to build branches in far-flung and off-the-beaten-path locations. In 1949, there were 147 bank branches, which had grown to 3418 by 1971. The number of branches has decreased to 2600 as a result of the secession of East Pakistan (now Bangladesh). There is evidence that bank loan demand was low

soon following Pakistan's independence. Due to rising industrialization, bank loans utilized in the industrial sector surged from 16 percent in 1953 to 49 percent in 1972.

The government persuaded the import substitution programmed for industrial growth to strengthen its manufacturing industry via public and private sector investment at the expense of trade. However, while the industrial sector's credit share grew, the agricultural sector's credit share shrank (Zaidi, 1999). Most private banks were held by industrialists in the 1970s, and they funnelled credit to a small number of companies controlled by a small number of families. This skewed loan distribution to industries resulted in a concentration of financial wealth in a few hands. Despite these 16 issues, the macroeconomic and political context encouraged government control of financial institutions, resulting in bank nationalization. All banks in Pakistan have been nationalized since 1974, when the federal government promulgated the bank nationalization legislation, which gave the federal government exclusive ownership, administration, and control of all banks in Pakistan.

The primary goal of nationalization was to steer credit to the key sectors of the economy in accordance with the government's favored development strategy. In the meanwhile, thirteen banks were nationalized to provide the financial needs of key industries, and they were eventually combined into five large banks1. The SBP's function as a policymaker in creating and implementing monetary policy was weakened when the Banking Council was created to evaluate the performance of commercial banks. Nationalization was intended to sever the relationship between industrial and financial capital. The percentage of private sector investment in the manufacturing industry fell from 87.2 percent in 1972 to 33.1 percent in 1977, according to the findings. This nationalization policy pushed private sector investment out due to the reversal of pro-industrial policies, which had a negative impact on economic growth, but the public sector

was investing in heavy and intermediate goods and was declared to be the largest shareholder of industrial assets by the end of the 1980s Ahmed and Amjad, (1984).

The banking sector in Pakistan was dominated by five public sector banks at the end of the 1980s, which were catering to the needs of the government, subsidizing fiscal deficits, and engaging in trade financing. They were also characterized by higher intermediation costs, overstaffing and over branching problems, a large amount of nonperforming loans, poor customer service, undercapitalization, a limited product range, undue interference in loan recovery, and personnel Khan and Sajawal, (2007). However, due to pro-industrial policies and government intervention in lending choices, banks refused to lend to small and medium-sized businesses, farmers, and the housing sector. Small and medium-sized businesses, as well as the agriculture sector, are the main sources of employment in Pakistan, yet they have been denied banks loans and advances.

Furthermore, the banking business had to pay a higher tax rate of 58 percent compared to the corporate sector's 35 percent Hussain, (2006). All of these factors put a greater burden on customers in the form of increased borrowing and lower deposit rates. Due to a lack of financial regulation, the banking system was undercapitalized and bankrupt. The International Monetary Fund (IMF) and the World Bank both advised changing the financial structure of banks by privatizing state-owned banks and introducing market-based operations in Pakistan's banking industry. These financial changes were intended to result in better resource allocation and efficient mobilization of domestic funds, resulting in a major influence on economic development by stimulating competition in the banking industry.

Inefficiencies occurred in Pakistan's banking system in the late 1980s, which was prone to political influence, mismanagement, and corruption. Furthermore, administrative interest rates,

which were negative in real terms and imposed by authorities, were negative in real terms. Direct operation was used to carry out monetary policy. The money market, as well as the bond and equities markets, were not well developed. Banks were lending to priority areas of the economy based on political leaders' recommendations rather than their own profitability, resulting in state-owned banks' collapse due to a harmful increase in nonperforming loans. Rather of focusing on economic efficiency, banks prioritized social goals. Distortions and inefficiencies of this nature not only posed macroeconomic challenges, but also posed a threat to national security. Such inefficiencies and distortions not only imposed macroeconomic barriers, but also slowed economic progress. As a result, financial sector reforms were implemented to remove these roadblocks, including the privatization of NCBs, the free entry of private banks into the banking industry, the recovery of bad loans, the expansion of the bank branch network, and the stabilization of nonbank financial intermediaries.

The main goal of the reforms was to eliminate the banking sector's systematic sources of economic inefficiency and make it more productive and efficient by stimulating more competition through the privatization of national commercial banks and the liberalization of free entry of private and foreign banks into the banking industry. As a result, it was anticipated that these policies would have a favorable impact on economic growth. However, the first generation of financial reforms, which began in the 1990s, may be divided into three periods. From 1990 to 1996, the first phase of changes was implemented, followed by the 2nd phase from 1997 to 2000, and the 3rd phase from 2001 to 2004. (Khan and Khan, 2007). The Bank Act of 1974 was revised in the 1990s to allow the federal government to sell NCB shares, making the process of privatization easier. Two government banks were privatized in 1991 after the private sector purchased a 26 percent stake in two Muslim commercial banks.

In the next year, the company's 51 percent shares were sold, and management and ownership were passed to private investors. In the same year, the employee stock ownership plan and management group sold 26 percent of Allied Bank of Pakistan's equity. In August of 1993, 25% of the company's stock was sold to the private sector. In 1993, the government sold 26 percent of United Bank Limited and transferred ownership rights to a private owner (SBP, 2003). In 1974, the banking sector established a restriction on the establishment of private banks. This embargo was repealed in August 1991, when ten new banks4 and eleven additional banks5 were authorized to begin operations as commercial banks. Two international banks have been given authorization to begin operations in the banking sector. In addition, in 1994, two provincial banks were designated as schedule banks. The extensive privatization of NCBs and the introduction of new private banks into the banking market caused state-owned banks' share of total assets to fall from 93.3 percent in 1990 to 22 percent in 2004 (Burki and Niazi,2010).

The major goal of privatizing state-owned banks was to increase competition in the business and enhance bank efficiency. In 1995, a moratorium was approved and enforced on issuing licenses to bank holding companies with minimal capital requirements in order to minimize unhealthy competition and bank mushrooming’s. The Banking Companies Ordinance Act of 1962 was changed to strengthen bank governance, and the SBP was given authority to supervise and oversee banks. To recover the loans, banking courts were also established. In the early 1990s, the credit ceiling and interest rate ceiling were repealed, and monetary policy is now carried out through open market operations. In the 1990s, a capital market was established for the acquisition and selling of bonds and securities. Due to rising intermediation costs, nonperforming loans (NPLs), and a lack of a judicial framework to tackle the problem of default loans, Pakistan's banking sector was once again in crisis by the end of 1996. Because 90% of

their loans were declared defaulted, NCBs and non-bank financial institutions were classified as loss makers.

National commercial banks had a large bank branch network in far-flung places, with an inflated work force, which increased production costs and harmed bank efficiency. Up until 1997, we may claim that reform policy was not very successful all of these issues enhanced the financial system's systemic risk. As a result, in 1997, a second tier of changes was enacted to create a strategy for financial stability. As a result, in 1997, the SBP encouraged banks to close down weak bank branches. In the meanwhile, partially privatized NCBs were fully privatized. Privatized banks were urged to construct branch offices around the country in order to make loans to lower-tier sectors such as consumer banking. Banks were reorganized using capital maintenance in accordance with the Basel Accord I, with public monies injected to help. Due to labour union pressure, banks had an overabundance of workers, therefore downsizing began in December 1999 with the introduction of the golden handshake plan. SBP was reinforced to serve a more effective function as a custodian of all banks, and direct and concessional loan initiatives were launched to integrate markets. However, the industry's fast development was fueled by private banks' ease of entry and branch liberalization policies. SBP increased the minimum paid-up capital of banks from Rs. 500 million in December 1998 to Rs. 1 billion in December 2003, resulting in bank consolidation.

In 2005, the minimum paid-up capital requirement was increased to $2 billion. Up to 2006, 19 mergers were in the works, and five additional mergers were reported in the banking industry by the end of 2010. Consolidation's main goal was to safeguard banks from contagion risk by boosting customer trust in the banking industry. In the form of mutual funds, asset management firms, foreign exchange companies, and venture capital, banks pioneered consumer

and universal banking. Debit cards, vehicle loans, home finance programs, SME financing, and other items are produced by banks. Customers received high-quality financial services from banks using contemporary e-banking. Online banking was launched, and a massive ATM network was established across the country. In December of 2008, the Basle Accord II went into effect. The goal of Basel II was to improve banking sector safety and soundness by ensuring capital sufficiency for risky operations, introducing more extensive risk management methodologies, and promoting competitive equality.

The government has separated SBP into three subcategories in order to reinforce its position as an independent and efficient regulator: 1) As a central bank, SBP, SBP-Banking Services Corporation (SBP-BSC), and National Institute of Banking and Finance are all included (NIBAF) and all these are government bank. To manage and control the capital market, leasing, and investment banks in Pakistan, the Securities and Exchange Commission of Pakistan (SECP) was established in 2001. Currently, the financial industry is regulated by both the SBP and the SECP. The State Bank of Pakistan supervises Pakistan's commercial and development banks, while the SECP supervises Pakistan's microfinance institutions. In Pakistan, the banking industry was diverse, including nationalized commercial, private, foreign, development, and microfinance institutions. In 1993, Pakistan had 33 commercial banks, 14 of which were domestic and 19 of which were international. Due to the ease with which banks entered the banking business, the number of banks expanded to 43 by the end of 2001, with 24 local banks and 19 international banks.

Pakistan had 45 schedule banks at the start of 2011, 37 of which were local banks and the rest were foreign banks. There were 19 bank mergers in the recent decade, with nine international institutions being bought by domestic private banks (Burki and Niazi, 2010).

However, the State Bank of Pakistan (SBP) employs some standard criteria to assess the banking sector's ability to resist shocks. Capital adequacy metrics include capital to risk weighted assets, risk weighted capital adequacy needs, and capital to total assets. Asset quality is assessed using non-performing loans (NPLs) and provision for NPLs. Return on assets (ROA) and return on equity (ROE) are used as proxies for a bank's profitability, while liquid assets to total assets, liquid assets to total deposits, and advances to total deposits are used to assure the bank's financial stability. SBP assesses the banking sector's strength and susceptibility using financial soundness indicators. Commercial banks examine their financial strength using the risk weighted to capital adequacy ratio as an indicator of capital adequacy. In 1997, the whole bank ratio was 4.5 percent, but it has now risen to 14 percent.

In 1997, the benchmark was set at 8% by the Basle committee. This suggests that Pakistan's banking system was adequately capitalized, having met the minimum capital requirement, and that the banking sector was robust to economic shocks. In 1997, state-owned banks had 1.3 percent of risk-weighted CARs, but by 2009, they had 15.1 percent. Similarly, risk-weighted CARs for private and international banks improved. State-owned banks' capital to risk-weighted assets ratios have improved from 0.6 percent in 1997 to 12.6 percent in 2009, private banks' 15.5 percent to 11.4 percent, and foreign banks' 14.6 percent to 22.5 percent. In 1997, it was 6.3 percent and in 2009, it was 5.8 percent for specialist banks. The capital-to-asset ratio improved for state-owned and private domestic banks, but fell for international banks.

Asset quality is used to assess a bank's solvency risk. It is also employed as a measure of a bank's financial performance. However, the provision against nonperforming loans (NPLs) has grown over time. As a measure of asset quality, both the ratio of NPLs to total loans and the ratio of provision to NPLs are utilized. This indicates that the asset quality increased over time with

the introduction of banking sector reforms. The ratios of return on assets (ROA) and return on equity (ROE) are used to assess a bank's profitability. However, for all three types of banks, ROA has deteriorated, and ROE has also decreased over time. State-owned banks have a better return on assets (ROA) and return on equity (ROE) than private and international banks. However, profitability of state-owned banks, private banks, foreign banks, and specialized banks has dropped over time.

Bank liquidity is measured by liquid assets to total assets, liquid assets to total deposits, and advances to total deposits. Both state-owned and private banks' liquid assets to total assets ratios have decreased, but international banks' ratios have improved. State-owned, specialized, and international banks improved their liquid-to-total-deposit ratios, whereas private banks saw a fall. Private, state-owned, specialized, and international banks all improved their advances to total deposits. Reforms in the banking industry have a favorable influence on the four types of indicators used to assess a bank's financial soundness. The deregulation process and competitive environment compel us to investigate the impact of banking sector changes on the sector's structure and efficiency in order to determine which banks can survive in the competitive climate and which banks should be driven out.

Historically, bank risk-taking literature had linked financial liberalization to financial development, but not to financial factors as a whole. A review of literature also suggests that there are several hypotheses about the relationship between financial liberalization and financial development: Due to weak governance, political instability, and other issues, robust privatization policies along with financial and banking sector reforms were unable to boost economic development in the 1990s. Until the late 1990s, inflation continued in double digits, creating a climate of uncertainty for investors and lowering investment. As a result, Pakistan has been

saddled with high nominal interest rates. However, beginning in the late 1990s, all financial and economic indices began to recover.

The State Bank of Pakistan's regulatory and supervisory powers have been greatly enhanced, and rigorous adherence to prudential requirements has resulted in widespread recapitalization and a corresponding improvement in the banking sector. In 2001, the Federal Reserve made a significant structural adjustment in monetary policy to address the problems provided by changes in the exchange rate system, the need to raise liquid foreign exchange reserves, and the implementation of hard objectives to keep government borrowing under strict control. The proportion of gross non-performing loans to total advances has steadily decreased. Through mergers and acquisitions, closure, liquidation, and restructuring, the financial sector reforms have reshaped Development Financial Institutions (Husain, 2006). Therefore, this study emphasizes the effect of financial liberalization on bank risk taking.

Chapter 3

Data and Methodology

3.1 Introduction

The study determines the association of financial liberalization with bank risk taking for Pakistan. For this purpose, the study uses both micro-level variables and macro level variables data for the panel of 26 banks of Pakistan. The existing literature shows that different studies show the impact of financial liberalization and bank risk taking for different countries some studies show bank efficiency with bank characteristics while other study shows economic growth with financial liberalization but we could not find any studies in the case of Pakistan. Therefore, our research plan to investigate the effect of financial liberalization on bank risk taking for the country of Pakistan.

3.2 Data, Sample and Variables Description

The study has selected country of Pakistan for its analysis because it is poor developing country with high population growth rate. In addition, mostly poor countries have higher degradation of financial factor and also in developing countries there is more competition in the banking sector so, it is important to know about the effect of financial liberalization on the bank risk taking for the country of Pakistan. The study sample includes panel of all banks, commercial banks and Islamic banks in account for almost 90% of total banking assets for the dependent variable bank risk taking and all explanatory variables financial liberalization, bank characteristics (size, age, liquidity, capitalization and efficiency) and macroeconomic variables

(GDP growth, monetary policy and inflation rate) for the country of Pakistan from the year of 2011 to 2021.

3.3 Description of the variables

The study uses the variables such as financial liberalization, bank characteristics (size, age, liquidity, capitalization and efficiency) and macroeconomic variables (GDP growth, monetary policy and inflation rate) to check their effect on bank risk taking. All the variables are discussed in the following subsection.

3.4 Bank risk-taking

In the study bank risk taking is used as a dependent variable. Bank risk taking is the influence of risk governance on bank, we address four distinct viewpoints of risk namely credit risk, liquidity risk, operational risk, and insolvency risk. To assess bank risk-taking behavior, we shall use the Z-score. Following standard literature, Z-Score is defined as:

$$Z_{it} = \frac{ROA_{it} + EA_{it}}{\sigma(ROA_{it})} \qquad (3.1)$$

Where ROAit shows the return on assets of the bank I in year t; EAit indicates the ratio "of equity over total assets and σ (ROA) is the standard deviation of return on asset. According to Roy (1952), the inverse of the probability of banking crisis is the number of standard deviations of profits that must fall below their mean to bankrupt the bank. Bank stability is shown by Z-score, or has a reduced risk of going bankrupt. We use the natural logarithm.

3.4 Financial liberalization and their index

Financial liberalization is the unrestricted convertibility of currency (monetization), the freeing of interest rates, and the relaxation of credit allocation rules and reserve requirements are all examples of financial independence in the country. The financial liberalization index will be perspective use on regulation and banking sector. The study follows, Rahman, et al (2021) perspective financial liberalization index up to 2017, we update that index to 2021. We use seven financial reforms dimensions to construct the financial liberalization index, namely regulation and interest rate, credit control, reserve requirement, banking ownership, prudential regulation, pro-competitive measure and development in the security market. Interest rate measures the extent to which the government removes rate of interest limitations on banks. Credit control indicates that designated or policy credit is being reduced, if not completely eliminated. Reserve requirement indicates a reduction in the reserve ratio.

Bank proprietorship refers to the rate of nationalization of financial institutions being reduced. Prudential regulation provide new financial methods for compensating the country's society and economy Practical regulation provide improve and assess regulatory structures as well as individual financial organizations. Pro-competitive measure promoting competition in the bank. Development in the security market refers to the government's interference in the securities market in order to reduce the market's size. The study used different sources for data collection, financial assessment report issued by the State Bank of Pakistan (SBP) from 1990-2020. Economic survey of Pakistan conducted from 2005 onward, State Bank of Pakistan (SBP) banking sector review. The study uses Principal Component analysis (PCA) method is used to construct the whole indices of financial liberalization. The benefit of this approach over the

simple average is that all the variables are compiled into a matrix to determine the principal components, which removes redundancy brought on by the correlation between the variables and results in much more understandable data (Bandiera, Caprio, Honohan, & Schiantarelli, 2000).

3.4 Bank ownership

Bank ownership is the legal possession and control of property, which can be any tangible or intangible asset. Ownership can involve multiple rights, referred to collectively as title, that can be separated and held by different parties. In this study banking ownership can be measured from state own bank. Prudential regulation provide new financial methods for compensating the country's society and economy Practical regulation provide improve and assess regulatory structures as well as individual financial organizations.

3.5 Bank Characteristics variables

3.5.1 Size

The natural logarithm of the value of total assets in US dollars is used to determine the size of a bank. We adjust for key bank characteristics. Based on a detailed study of the literature on possible factors of bank risk-taking, Bank risk-taking is predicted to be influenced by size, computed as a natural logarithm of total assets, although the implications are unclear (Cubillas and González, 2014).

3.5.2 Liquidity

Liquidity is the effectiveness with which an asset or security may be converted into cash without having an influence on its market price. Contrary to tangible assets, cash is the most liquid asset. The two most prevalent types of liquidity are market liquidity and accounting liquidity. A bank's capacity to withstand unforeseen external shocks and deposit runs may be enhanced by liquidity; but, the profitability of the bank would suffer, further jeopardizing its stability, if it held on to the more liquid assets in anticipation of greater variable returns. The trade-off between the price at which an item may be sold and how soon it may be sold is known as liquidity. Since sellers may move swiftly without having to accept a much lower price in a liquid market, the trade-off is modest. In a market with high volatility, an asset must always be reduced to sell rapidly.

3.5.3 Capitalization

Capitalization is an accounting technique where a cost is capitalized into the asset's value and deducted over the course of the asset's useful life rather than deducted from the asset's value at the time it was incurred. Market capitalization, a metric of a company's total market value, is alternatively defined as the number of outstanding shares multiplied by the share price. Capitalization is a method of accounting that permits an asset to be depreciated during its useful life while remaining on the balance sheet rather than the income statement. According to capitalization, banks that have high levels of leverage and little liquidity are more likely to fail.

3.5.4 Efficiency

An efficiency ratio is very important in the banking industry. The efficiency ratio for banks is noninterest expenditures compared to income. This illustrates how expertly the bank's management manage overhead expenditures, sometimes referred to as "back office" charges. According to the management hypothesis, bank efficiency is poorer, which results in more problem loans since credit monitoring and operating costs are higher.

3.5.5 Age

Banks age, which is defined as the duration of a bank's operating time from its inception and calculated as the difference between the current year and the year of its inception.

3.6 Macroeconomics Variables

we also include a set of macroeconomic factors, such as real GDP (gross domestic product) growth rate, inflation rate, and monetary policy.

3.6.1 Real GDP

The worth of all goods and services produced by an economy in a given year is estimated using real gross domestic product (real GDP), which has been adjusted for inflation (expressed in base-year prices). It is also referred to as GDP in constant dollars, GDP adjusted for inflation, and GDP at constant prices. The main statistic of an economy, the Gross Domestic Product (GDP), demonstrates that Pakistan's economy was backward for a long period. The amount of

Real GDP, Per Capita GDP, and their growth rates were tiny in the years after independence, although they increased after 1990. The GDP of Pakistan's 64 districts is analyzed in this analysis at current market values.

3.6.2 Inflation rate

The rate at which prices increase over time is what determines inflation. The term "inflation" often refers to a broad index of price rises or increases in the cost of living in a nation. However, it may be calculated more precisely for some things, like food, or for services, like a haircut. Anytime a collection of goods and services has increased in price during a specified time period, usually a year, this is referred to be inflation.

3.6.3 Short term interest rate

Short-term interest rates are the costs associated with short-term borrowing by financial institutions or the issuance and open market trading of short-term government debt. To calculate short-term interest rates, daily rates' percentage averages are employed. The choice to change the money supply and interest rates is known as the central bank's monetary policy.

3.7 Unit of data collection

The data of micro level and macro level variable is taken from different sources. Macro level variables is taken from world development indicator and micro level variables are taken from annual financial annual statements, state bank website and financial assessment report. For some variable indexes are made. Variables data and description of both micro-level variables macro- level variables are as follow:

Table 3.1 Unit of data collection			
Variables	Description	Source	Year
Micro level variables			
Bank risk taking	(1 + [ROA + EA] / σ (ROA)), is the natural logarithm. EA used for equities-to-assets ratio, equities- (ROA) shows return on assets standard deviation. Lager score determining a smaller probability of indolent of bank, you can say that a larger degree of bank stability	AFS	2011-2021
Bank characteristics			
Liquidity	The ratio of liquid assets to total assets (%)	AFS	2011-2021
Size	Natural logarithm of bank total assets	AFS	2011-2021
Capitalization	The ratio of equity to total assets (%)	AFS	2011-2021
Efficiency	The overhead cost to total income (%)	AFS	2011-2021
Age	Natural logarithm of the deduction between current year and establish year	SBP	2011-2021
Financial liberalization	We create a seven-dimension annual financial liberalization index. The total financial liberalization index is calculated using a principle component method. Seven dimensions namely regulation and interest rate, credit control, reserve requirement, banking ownership, prudential regulation, pro-competitive measure, and development in the security market. A higher score indicates more financial liberalization.	Financial Assessment reports	2011-2021
Macro level variables			
GDP growth	GDP growth (%)	WDI	2011-2021
Monetary policy	Short-term interest rates (%)	WDI	2011-2021
Inflation rate	The percentage change in the consumer price index (%)	WDI	2011-2021

3.8 Method

The study plan to investigate the association between financial liberalization and bank risk-taking in Pakistan. The general form of our module as given follows:

$$Risk\ i,t \quad = \quad f(FL_t) \qquad (3.2)$$

Where Risk i, t is Bank risk tanking while I show number of crossection, t shows number years, and it is our dependent variable. While FL is financial liberalization is independent variable, and it is our focused variable.

3.9 Model specification

The study will use the following model. The functional form of the model;

$$Risk = f(FL, Bankchar, Macro) \qquad (3.3)$$

Here dependent variable Risk-taking and explanatory variables are FL shows financial liberalization, Bank characteristics (Bankchar) shows (size, liquidity, capitalization, efficiency, and age), macro shows macroeconomic variables (monetary policy, GDP growth, inflation rate).

Equation of the model as follows;

$$Risk_{i,t} = \beta_0 + \beta_1.FL_t + \beta_2.LQ_{i,t} + \beta_3.CAP_{i,t} + \beta_4.SZ_{i,t} + \beta_5.AG_{i,t} + \beta_6.EF_{i,t} + \beta_7.GDP_t + \beta_8.IFR_t + \beta_9.SRIR_t + V_{i,t} \qquad (3.3)$$

From the equation (3.3) i and t show bank i and year t, respectively. The dependent variable is risk and the independent variables are financial liberalization (FL), liquidity (LQ),

capitalization (CAP) bank efficiency (EF), bank size (SZ), age (AG), gross domestic product (GDP), inflation rate (IFR), short run interest rate represent bank attributes as well as macroeconomics variables. The 1-year lag for each bank characteristic variable is applied to reduce the indigeneity problem.

3.9 Econometric technique

The research produces estimates for equation 3.3, which is used to look at how financial liberalization affects bank risk-taking. As one of the better tests that can be used to differentiate between fixed and random effects models, the study employs the pooled OLS, fixed effect, random effect, and Hausman test for cointegration for this purpose. In this study, Random effects (RE) is favored under the alternative hypothesis because it is more effective than Fixed effects (FE), which is preferred under the null hypothesis because it is more efficient. Following are the key practical differences between the two effects:

Fixed effects are not estimated with partial pooling; only random effects are. Partial pooling indicates that when a group has few data points, the group's effect estimate will be relied in part on other groups' more abundant data. The Hausman Test identify endogenous regressors in a regression model.

3.9.1 Unit root test

The study uses Lm-Pesaran shin and Harris-Tzavalis test panel unit root tests are used in this study to look at the stationarity of the variables for Pakistan. At level or at the first difference, all the variables will be stationary. We cannot use fixed effect, random effect, or

Hausman effect if any of the variables are stationary at second. Unit root tests of stationarity should be performed on all dependent and independent variables before to applying fixed effect, random effect, and method. It is the initial defense against the issue of erroneous findings. The data series has to be static at level I (0) or at the first difference I. (1).

3.9.2 Fixed Effect and Random Effect model

When it comes to selecting a Panel model employing fixed (FEM), random (REM). By monitoring alterations within groups over time, fixed effects models eliminate bias resulting from omitted variables. To avoid omitted variable bias, we can utilize the fixed-effect model. Multiple elements like location, state throughout multiple time periods are represented in panel data, and it is also known as longitudinal data like yearly or timely random variables occur in time series data which is a basic component of fixed effect regression. The normal distribution premise may be used to draw conclusions from population data using the random-effects model. In the random-effects model, it is assumed that individual-specific effects have no correlation with the independent variables.

3.9.2 Hausman test

The Hausman Test, also known as the Hausman specification test, finds endogenous regressors in a regression model (predictor variables). The other variables in the system reflect the values of endogenous variables. Before choosing a model, Hausman's tests are performed to compare the estimators of the tested models. The Hausman test can be applied if the null hypothesis predicts that one of the compared models will produce consistent and efficient results

while the other will produce consistent but inefficient results, and the alternative hypothesis predicts that the first model will produce inconsistent results while the second model will produce consistent results.

In panel analysis, the Hausman test may be used to distinguish between models with fixed and random effects. The study favours Random effects (RE) because it is more effective under the null hypothesis, even though Fixed effects (FE) are at least as consistent as Random effects (RE) and are thus preferable under the alternative hypothesis. The difference between the fixed effect as well random effect on the basis of their significancy is that for the estimation of random effect model partial pooling approach is used rather while no such approach is used for fixed effect model. Partial pooling is the estimate effect on group which is based in part having more abundant data from other groups and it is in the case when group have some data point. For the regression model of Hausman tests endogenous regressors (predictor variables) can detected. Endogenous variables values can be determined within the model.

$$H = \frac{\beta_{FE} - \beta_{RE}}{Var\ (\beta_{FE}) - Var(\beta_{RE})} \qquad (3.4)$$

Chapter 4

Result and Discussion

4.1 Introduction

In this chapter, we have discussed estimation results of our study. The study estimates relationship between Bank risk taking and financial liberalization (FL) for a sample of all banks in Pakistan. Therefore, this chapter is divided into sub-sections where each subsection explains results for each panel of banks.

The study first, we have applied descriptive statistics to examine that the data is normally distributed and the lag value shows negative or positive relation which is explain in section 4.2. Correlation matrix are used in section 4.3 to check that there is strong correlation or weak correlation between the variables. The remaining section of the contain each panel in which we tested each panel data for stationarity of the variables by applying LM Pesaran-shin and Harris-Tzavalis tests. Moreover, constant term and optimum lag lengths selection criteria are used. The study used Hausman test to check that fixed effect or random effect is appropriate.

The following sub-sections provides the estimation results for each panel of banks included in our sample.

4.2 Construction of financial liberalization index through Principal components analysis (PCA)

PCA is a statistical data technique that identifies related variables within a given dataset, loading them into components. The findings are a series of components, each containing variables

measuring similar concepts and together capturing a significant portion of the variance in the original data set. PCA helps reduce many of the problems related to previous efforts to calculate steering scores (Gompers et al. 2003, Larcker et al. 2007).

Table:4.1 shows the estimated results by using principal components analysis.

Table-4.1 PCA results

Principal components/correlation — Number of obs = 11
Number of comp = 7
Trace = 7
Rotation: (unrotated = principal) Rho = 1.0000

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.874	1.733	0.411	0.411
Comp2	1.142	0.051	0.163	0.574
Comp3	1.090	0.309	0.156	0.730
Comp4	0.781	0.204	0.112	0.841
Comp5	0.577	0.149	0.082	0.923
Comp6	0.428	0.320	0.061	0.985
Comp7	0.108	.	0.015	1.000

Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Unexplained
regulation	0.327	0.619	0.231	-0.312	0.410	-0.110	0.424	0
credit control	0.458	0.282	0.247	0.142	-0.229	0.641	-0.407	0
Reserve req	-0.444	-0.181	0.298	0.186	0.431	0.598	0.320	0
bank ownership	0.413	-0.316	0.087	0.373	0.648	-0.244	-0.321	0
pro competition	-0.265	0.514	0.054	0.768	-0.108	-0.246	0.032	0
development	0.489	-0.328	-0.015	0.330	-0.315	0.038	0.666	0
entry barrier	-0.080	-0.185	0.886	-0.099	-0.250	-0.312	-0.063	0

4.3 Descriptive statistics

The study applied descriptive statistics which include 286 total observations in which the outlier is excluded for bank risk and bank specific characteristics that fall below the first percentile and above the 99th percentile . It is evident that the sample banks' Z-scores (bank risk) are distributed according to the mean are 3.213, standard deviation 0.989, and ranging from -

1.461 at the lowest point to 7.958 at the highest. The relatively high standard deviation and wide range of bank risk highlight a significant variation in risk level across banks.

It can be seen that the bank characteristics (liquidity, capitalization, age size and efficiency) of the sample banks is distributed with the mean value of liquidity 0.066, the standard deviation of 0.023, and are ranged between the minimum 0.000 and the maximum 0.162. The fairly high standard deviation and the wide range of Z-scores highlight a substantial variation on the level of risk across banks. For the capitalization it lies between 0 to 1 with mean of 0.153 and standard deviation of 0.722. With regard to financial liberalization, the mean value is 3.383 and its standard deviation is 0.749 with minimum of 5.697 and maximized of 7.975, indicating a considerable heterogeneity on financial liberalization in years. The mean value, relatively large standard deviation and wide range of Z-scores suggest a significant difference in risk levels among institutions. In this case, a higher score indicates better (more) control. As a result, in our empirical research, we do not include this as a feature of financial liberalization and eliminate it from the calculation of the total liberalization score.

Table 4.2 Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Financial Liberalization FL	286	3.383	0.749	5.697	7.975
Bank Risk Taking Z-score	286	3.216	0.989	-1.461	7.958
Bank Characteristics					
Liquidity	286	0.066	0.023	0	0.162
Capitalization	286	0.153	0.722	-0.129	12.13
Efficiency	286	1.172	4.731	-0.947	79.572
Size	286	19.623	1.214	16.48	22.186
Age	286	3.547	0.672	2.398	5.063
Macroeconomics Variables					
GDP	286	3.406	2.234	-0.935	5.846
Inflation	286	7.413	3.003	2.529	11.916
Short term interest rate	286	8.838	2.138	5.82	12.472

4.4 Correlation Matrix

Table 4.3 shows the correlation matrix among various variables which we used in our analysis for the period 2011-2020 for 26 banks in Pakistan. If one variable changes (increase/decrease) another variable must change (increase/decrease). So, there may be positive correlation or negative relation between the variables. Variables having positive relation must have the same trend while variables having negative relation have different trend in the banking sector. This fact indicates that greater financial liberalization reforms result in greater bank stability. The variables associated with banks and the macroenvironment are not found to be highly correlated with each other, implying that combining these variables will not result in serious multicollinearity issues.

Table 4.3; Correlation Matrix

	Risk	FL	Capt	Ef	Liq	Size	Age	GDP	INF	SRIR
Risk	1.000									
FL	-0.277	1.000								
Capt	0.324	-0.017	1.000							
Ef	-0.166	0.081	-0.027	1.000						
Liq	0.018	0.116	-0.065	0.124	1.000					
Size	-0.024	0.241	-0.064	-0.073	0.429	1.000				
Age	0.207	0.000	0.200	-0.107	0.114	0.282	1.000			
GDP	0.088	-0.440	0.067	-0.130	-0.089	-0.127	-0.009	1.000		
INF	0.084	0.232	-0.065	0.055	0.099	-0.051	0.008	-0.732	1.000	
SRIR	0.133	0.075	-0.078	0.002	0.090	-0.089	0.009	-0.600	0.924	1.000

Table 4.3 shows the correlation which determine the association between dependent and independent variables. From the table it can be shown that bank Risk has a negative relationship with Size, INFR and SRIR while it shows a positive relationship with financial liberalization (FL), Capitalization (CAP), efficiency (EF), age and GDP. Liquidity value with risk is 0.000 which show correlation with risk, efficiency have weak correlation with risk, liquidity have negative and weak correlation with financial liberalization. According to Gujrati (2003) that multicollinearity problem within the dependent variables is greater than 0.10. From the table the only the value 0.92 shows strong correlation. Therefore, there is less chance of multicollinearity problem less than the threshold limit.

4.5 Unit root test

In this study, Lm-Pesaran shin and Harris-Tzavalis test panel unit root tests are applied to investigate the integration order of the variables for the country of Pakistan. At first difference financial liberalization (FL), risk, size and GDP is stationary as I (1) but liquidity, efficiency capitalization, inflation rate and short-term interest rate are level stationary or I (0). Before applying Hausman test, fixed effect and random effect model, unit root test of stationarity should

be checked for all the dependent and independent variables. It is the first step to safeguarding from the problem of spurious results. The data series must be stationary at level I (0) or at the first difference I (1). No such variables which is stationary at 2nd difference I (2). If there are such variables which stationary at 2nd difference order of I (2) than by applying Hausman test criteria result outcomes will be spurious meaningless. The result of the Haris-Tzavalis and Lm-pesaran panel unit root tests are reported in table 4.4.

Table 4.4: Result of unit root test for the panel of all banks

Variables	**Harris-Tzavalis**		**Lm-Pesaran shin**	
	I (0)	I (1)	I (0)	I (1)
FL	0.729	-0.189***	4.195	-6.431***
Risk	-0.093	-0.498***	-3.625	-5.874***
Bank Characteristics				
Liquidity	0.325***	-	-2.741***	-
Size	0.887	-0.193***	5.433	-5.874***
Age	0.000****	-	-0.819	-5.902***
Efficiency	-0.177***	-	-3.707***	-
Capitalization	-0.110***	-	-0.819***	-
Macroeconomics Variable				
GDP	0.796	0.218***	3.810	-3.385***
Inflation rate	0.568**	-	-1.981**	-
Short-term interest rate	0.392***	-	-3.913***	

Note: ***, ** and * indicate significance levels of 1%, 5%, and 10% respectively.

Table 4.4 shows the result shows that the dependent bank risk and independent variables financial liberalization (FL), size of the banks and GDP growth is stationary at first difference under 1% and 5% signific level so, their order of integration is I (1) while the remaining independent variables liquidity, age, efficiency, capitalization, inflation rate and short run interest rate are stationary at level so, their order of integration I (0). Result of unit root tests show that the variables are stationarity at level as well as at the first difference. Therefore, in this

study, Fixed effect, random effect and Hausman test is applied for associations with the dependent variable and explanatory variables (Pesaran and shin (2003)). The unit root test hypothesizes that the data is stationary, which means that the series has no unit root. Table 4.5-unit root test results show that there are no such variables for which the order of integration is second I (2). This means that all data sets for the selected variable are linked in series I (0) or I (1), Therefore, fixed effect and random effect and Hausman test is used in this study which as follows.

4.6 Fixed effect and Random effect model

When choosing a Panel model using random (REM), fixed (FEM), or both. By monitoring changes within groups over time and periodically using dummy variables to substitute for missing or unidentified data, fixed effects models reduce the bias caused by omitted variables. You can account for average differences among cities in any observable or unobservable factors, such as quality, sophistication, and so on, by inserting fixed effects (group dummies). All of the across-group activity is absorbed by the fixed effect coefficients. To avoid omitted variable bias, we can utilize the fixed-effect model. Multiple elements (e.g., geo-location, states) throughout multiple time periods are represented in panel data, also known as longitudinal data (e.g., year, or month). It is a necessary component of fixed effect regression. The normal distribution premise may be used to draw conclusions from population data using the random-effects model. In the random-effects model, it is assumed that individual-specific effects have no correlation with the independent variables.

4.6.1 Hausman test for the panel of all banks

The Hausman test, also known as the Hausman specification test, finds endogenous regressors in a regression model (predictor variables). The other variables in the system reflect

the values of endogenous variables. Before choosing a model, Hausman's tests are performed to compare the estimators of the tested models. The Hausman test can be applied if the null hypothesis predicts that one of the compared models will produce consistent and efficient results while the other will produce consistent but inefficient results, and the alternative hypothesis predicts that the first model will produce inconsistent results while the second model will produce consistent results.

$chi^2\ statistics(9)$	=	70.25	$Prob > chi^2$	=	0.000

The result of Hausman test shows that the probability of chi square statistics is 0.000 which is less than 0.05 at 5% significant level. Therefore, the null hypothesis of random effect model is rejected and alternative hypothesis of fixed effect model is accepted and conclude that the model is statistically significant and the fixed effect model is appropriate.

A low p-value indicates that the random effects model is more likely to be correct than the null hypothesis that the fixed effect model is consistent (Asteriou& Hall, 2007). As a result, it can be said that random effect is a superior analytical approach to apply in comparison to fixed effect.

Table 4.5 Fixed Effect model for panel of all banks, dependent variable is risk

	Include all the variables		Include only bank characteristics	
	Coef.	St. Err.	Coef.	St. Err.
FL	-0.080**	0.028	-0.059**	0.025
Liquidity	-1.825	2.2	-1.522	2.216
Capitalization	0.391***	0.044	0.38***	0.044
Efficiency	0.009	0.007	0.007	0.007
Size	-0.457***	0.104	-0.593***	0.083
Age	-44.123	53.777	-56.57	54.175
GDP	0.021	0.026		
inflation rate	0.013	0.035		
Short term interest	0.042	0.04		
Constant	168.222	191.038	215.54	192.38
Mean dependent var		3.213		3.213
R-squared		0.475		0.457
F-test		25.245		35.567
Prob > F		0.000		0.000
Number of obs		286		286

Note: *, ** and *** indicate significance levels of 10%,5%, and 1% respectively.

Estimated results by using fixed effect model shows in table 4.5. Obtained outcomes shows that financial liberalization has negative and significant impact on the banking risk at 1% level of significance with -0.08 coefficient value. These results show similarity with, Danier et al., (2007), stated that financial liberalization have positive impact on banking risk when they achieve threshold level of efficiency. In case of Pakistan banking system is not at efficient level that's why financial liberalization has negative impact on the bank taking risk. While all the variables have insignificant impact on the banking risk, only capitalization and size have significant impact. Because size of the banks cause to decline the banking risk, keely (1999).

The other independent variables bank characteristics liquidity, size and age shows negative relationship with bank risk taking behavior. The result shows statistically significant at 1% significant level while efficiency, capitalization, GDP, inflation rate and short run interested have

positive link with bank risk. The result shows that capitalization is statistical significant and the efficiency, liquidity are statistically insignificant at 1% and 5% Signiant level.

Efficiiency have and bank capitalization with bank risk and it is shown from the study of Hughes and Moon (1995) which emphasized the relevance of efficiency when examining the link between bank capital and risk. The theoretical reasons were followed by investigations that discovered bank risk-taking and moral hazard incentives are affected by both efficiency and bank capital. Furthermore, in the event of a banking system with diverse ownership arrangements, it is essential to determine if this connection (capita-risk-efficiency) is impacted by this element (ownership structure). Efficiency can increase bank risk according to Eatwell (1997) widely praised financial liberalization's administration of savings to the most effective investments, competition that increases the efficiency of the financial system, effective management of bank risks, higher investments and economic growth, and better government policies due to healthy financial discipline for the panel of total banks.

According to Altunbas, Carbo, Gardener, and Molyneux (2007) study, banks with greater capital are less efficient and more likely to take on high risks, while inefficient European banks have no incentive to take on additional risk. The findings indicate a positive association between risk and capital level, as well as the favorable effect that corporate financial health has on decreasing capital levels and bank risk-taking. Vasicek (2002), shows that the default of an individual loan is driven by the realization of two risk factors: a systematic risk factor that is common to all loans, and an idiosyncratic risk factor.

Liquidity have negative association with bank risk which is link with Calomiris et al. (2015) establish a theory on banking liquidity requirements, arguing that banks should be regulated on the basis of assets rather than capital. Banks should retain more liquid assets in

order to deal with liquidity risk and better manage and monitor the risks to which they are exposed.

Macroeconomics variable (GDP, interest rate and inflation rate) have positive effect on bank risk. Pakistan is developing countries. By increase in GDP investment will increase and it will tends to increase bank risk as people taking loan from banking sector and will not repay back which turn the bank go to risk. Interest rate can increase bank risk when private investor taking loan from banks non perfuming loan will tends to bank risk. When there is increase in production it will increase prices and inflation will increase which turn to increase more loan for survival and debt burden will increase and the bank will goes to risk.

4.7 panel of commercial banks for Pakistan

I Result of Hausman test

$chi^2 statistics = 0.234 \qquad Prob > chi^2 = 0.890$

Result shows that chi-square statistics probability is 0.890 which is greater than 0.05 at 5% significant level so, we are unable to reject the null hypothesis and conclude that the random effect model is appropriate. The result of random effect model is reported in table 4.6.

Table 4.6; Random Effect model for commercial banks, dependent variable risk

	Include all the variables		Include only bank characteristics	
	Coef.	St. Err.	Coef.	St. Err.
FL	-0.13***	0.026	-0.109***	0.024
Capitalization	0.394***	0.047	0.38***	0.047
Efficiency	0.008	0.008	0.005	0.007
Liquidity	0.51	2.177	1.403	2.2
Size	-0.17**	0.076	-0.345***	0.07
Age	0.313*	0.171	0.4**	0.192
GDP	0.055**	0.025		
inflation rate	0.046	0.036		
Short term interest	0.037	0.043		
Constant	4.469***	1.584	8.412***	1.431
Mean dependent var	3.213		3.213	
Overall r-squared	0.184		0.111	
Chi-square	190.791		171.242	
Prob > chi2	0.000		0.000	
R-squared within	0.457		0.437	
Number of obs	286		286	

Note: * , ** and *** indicate significance levels of 10%, 5%, and 1% respectively.

Estimated results by using random effect model shows in table 4.7. Obtained results shows that financial liberalization has negative and significant impact on the banking risk at 1% level of significance with -0.13 coefficient value. if there is 1% increase occurs in the independent variable financial liberalization (FL) it will bring 0.13% decrease occurs in the dependent variable. These results show similarity with Cubillas (2012), stated that financial liberalization have positive impact on banking risk when they achieve threshold level of efficiency.

In case of Pakistan banking system is not at efficient level that's why financial liberalization has negative impact on the bank taking risk. While all the variables have insignificant impact on the banking risk, only capitalization, age, size and GDP has significant impact on the banking risk, whereas size of the banks has statistically negative and significant

impact on the banking risk, the reason is that size of the banks cause to decline the risk. Also, it can be shown from the table that the independent variable bank characteristics Capitalization, liquidity, banks efficiency, GDP, short run interest rate and inflation rate have positive association with dependent variables risk taking. Bank size show negative relationship with dependent variable bank risk taking. And the result shows that it is highly statistically significant at 1% significant level. If there is increase in the size of the bank it will decrease bank risk taking. The independent variable capitalization, size and GDP shows statistically significant at 5% significant level. On the other hand, liquidity, efficiency, inflation rate and short run interest rate are statistical insignificant at 5% significant level.

According to Gorton and Rosen (1995), managers will take on more risks during periods of poor performance in the banking industry. Moral hazard incentives are reduced in better capitalized banks. The role of regulators and supervisors has an impact on the positive relationship between capital and risk. According to their requirements, any increase in a bank's risk-taking level must be accompanied by an increase in capital held to cover these risks. In the case of banks with higher levels of risk, the required additional capital buffer allows them to avoid the costs of issuing equity on short notice. The level of bank efficiency may have an impact on future bank risk. Furthermore, a decrease in efficiency will increase the bank's risk. Efficiency is positively and insignificantly link with bank risk. The efficient market hypothesis assures market information is utilised effectively, whereas the Pareto optimality theorem says competition leads to Pareto optimal equilibrium. These postulates ensure financial sector efficiency and competitiveness (Eatwell, 1997; Chowdhury, 2001). McKinnon (1973) and Shaw (1973) critiqued developing’s nations' financial restrictions. Financial restriction affects economic progress.

Liquidity have positive link with bank risk which is shown from the study of Diamond and Rajan (2005), there is a positive association between liquidity and bank risks. They stress that if too many economic ventures are supported with loans, the economy would suffer. The bank is unable to fulfill depositor demand. As a result, if the value of these assets declines, these depositors will be able to reclaim their funds. This suggests that both liquidity and bank risks are increasing at the same time.

Macroeconomics variable (GDP, interest rate and inflation rate) have positive effect on bank risk. Pakistan is developing countries. By increase in GDP investment will increase and it will tends to increase bank risk as people taking loan from banking sector and will not repay back which turn the bank go to risk. Interest rate can increase bank risk when private investor taking loan from banks non perfuming loan will tends to bank risk. When there is increase in production it will increase prices and inflation will increase which turn to increase more loan for survival and debt burden will increase and the bank will goes to risk.

4.7 Panel of Islamic banks for Pakistan.

I Hausman test statistic for Islamic banks

Chi square statistics = 20.470 prob (chi-square = 0.021)

From the result of Hausman test it can be shown that the value of probability of chi square is greater than 0.05 at 5% significant value which shows that we are unable to reject null hypothesis and conclude that random effect model is appropriate.

Table 4.7 Random Effect model for panel of Islamic banks; dependent variable risk

	Include all the variables		Include only bank characteristics	
	Coef.	St. Err.	Coef.	St. Err.
FL	-0.079***	0.028	-0.082***	0.026
CAP	20.21***	2.352	20.649***	2.356
EF	-0.992***	0.3	-1.082***	0.304
LIQ	0.748	1.397	0.853	1.414
SIZE	0.262***	0.082	0.207***	0.08
AGE	-0.516***	0.11	-0.516***	0.112
GDP	0.052*	0.027		
INFR	0.025	0.039		
SRIR	0.022	0.046		
CONSTANT	-1.381	1.934	0.264	1.825
Mean dependent var		3.313		3.313
Overall r-squared		0.836		0.817
Chi-square		229.670		215.000
Prob > chi2		0.000		0.000
Number of obs		55		55

Note: * , ** and *** indicate significance levels of 10%, 5%, and 1% respectively.

Estimated results by using random effect model in case of Islamic banks shows in table 4.7. Obtained results shows that financial liberalization has negative and significant impact on the banking risk at 1% level of significance with -0.07 coefficient value. These results show similarity with Helman et al., (2000) stated that financial liberalization have positive impact on banking risk when they achieve threshold level of efficiency. In case of Pakistan banking system is not at efficient level that's why financial liberalization has negative impact on the bank risk. While all the variables have significant impact on the banking risk, only inflation, short term interest rate and liquidity have insignificant impact on the risk, in case of Islamic banks.

From the result it is determine that bank specific characteristics efficiency and age have negative relationship with bank risk although the result shows that it is statistically significant at 1% significant level. The other variables capitalization, liquidity, bank size, GDP, inflation rate and short run interest rate have positive association with bank risk. Capitalization, bank size,

GDP are statistically significant at 1% and 10% significant level respectively. The other variables short run interest are statistically insignificant at 5% significant level.

Efficiency have negative relationship with bank risk. From Cho's (1988) definition of allocative efficiency as a reduction in borrowing cost variance is reductionist, since this variation diminishes as governments abolish directed credit and interest rate regulations. Even if all enterprises had the same borrowing costs, capital allocation wouldn't be efficient if noneconomic variables dictated lending.

Capitalization have positive and significant impact on bank risk and it is link with the study of Molyneux et al (2007) Banks with greater capital are less efficient and more likely to take on excessive risk, while inefficient European banks have little incentive to take on additional risk. The findings indicate a beneficial link. According to Caputo (2002), banks' default risk is mostly driven by insufficient capitalization, poor profitability, over-exposure to particular types of loans, and other factors loan defaults that are high.

Liquidity have positive association with bank risk with is link with the study of Acharya & Viswanathan, 2011) determine that the bank will utilize all of its loans, reducing total liquidity. As a consequence, increasing bank risk is associated with higher liquidity risk due to depositor demand. Financial firms incur loans that must be continually renewed and utilized to fund assets, since larger debts in the banking system increase the danger of a "bank run".

The relationship between risk and capital level, as well as the favorable impact that corporate financial health has on decreasing capital levels and bank risk-taking. There are no significant variations in this connection between commercial and savings banks, however capital

levels in cooperative banks are negatively associated to risks. According to Fiordelisi, Marques-Ibanez & Molyneux (2010) efficiency reduces risk-taking.

GDP, short run interest rate and inflation rate have positive effect on bank risk. Pakistan is developing countries. By increase in GDP investment will increase and it will tends to increase bank risk as people taking loan from banking sector and will not repay back which turn the bank go to risk. Interest rate can increase bank risk when private investor taking loan from banks non perfuming loan will tends to bank risk. When there is increase in production it will increase prices and inflation will increase which turn to increase more loan for survival and debt burden will increase and the bank will goes to risk. According to McKinnon (1973) and Shaw (1973), removing interest rate limitations will increase savings. Obstfeld (1994) believes that improved risk insurance may lead to a move toward higher-risk, higher-return initiatives. Increased bank competition may force enterprises to absorb production externalities when making investment choices, which might boost investment Ueda, (2006).

Qualitative Analysis

4.9 Introduction

This chapter is based on qualitative research methods which include the policy documents, analysis of acts and regulation, expert opinion and, interviews of officials from relevant and concerned departments and Central banks.

4.10 Interview of official from the state bank of Pakistan

In order to determine the linkage of financial liberalization and bank risk taking the questionnaire were developed. The interview was taken from the senior research policy makers and state bank officials. For the purpose of having good response from the respondents and to pick up there outstanding overviews related with the qualitative work.

In this regard the first question was brought under the consideration which was about the impact of financial liberalization having no government intervention and bank risk taking. The bank risk taking includes liquidity, efficiency and credit risk taking. So, the main question which was inquired was about the impact of financial liberalization (removing government intervention) on the liquidity, credit risk and efficiency. In addition, what will be the effect of financial liberalization by removing government intervention and bank risk taking? Either it will increase or decrease? To answer this question the respondent asked, from government you mean the state bank of Pakistan or the federal government. By further explaining this question the

respondent stated that the federal government has nothing to do with banking sector. The only institution which monitors the banking sector is the central bank. On the other side by framing the policies of import and export by the federal government can affect the market which in turns can affect the banking sectors directly or indirectly. According to the respondent the Europe has a different case there the banking sectors is independent entity. The banks can formulate laws and regulations. So , in order to conclude the question there will be an impact of financial liberalization on bank risk taking and also there should be uniformity in governance by the central banks as well as the policy procedure should be same on a peak level. Other than this like in Europe if you left the banking sector free then the risk factors will increase because there will be no centralized body to control the financial sector. For example, the crypto currency, those people who are trading on crypto currency irrespective of the state bank of Pakistan permission like in KPK. The result of this liberalization is there is a financial risk. Therefore, when the risk factor is big then the state bank of Pakistan formulates rules and regulations for the products and then approve it. So, in this case there will be an impact. Therefore, due to financial liberalization by removing the government intervention the risk factor will increase. Now coming to the second part of the question, like what will be its impact on liquidity. The official replied that liquidity will also increase as a result of increase in flow of money because there will no institution to control and no check and balance on the source of the money hence the risk factor will increase and liquidity will also increase.

The official was further inquired about association of financial liberalization with the efficiency of banking sector. In this regard the official argued that the efficiency of the banking sectors will increase if we remove the booms factors.

Upon further inquiry, the official was asked by increasing bank size what will be an impact on bank risk taking? To answer this question the official replied that by increasing the bank size the risk factor will not increase but the cost of the banking sector will spur. Furthermore, by increasing the numbers of branches the impact will be on services sectors means to say that the employment will grow further. As a result of this new people will get hired. Where there are new branch openings new shops will come in to existence. On the other hands, there will also be a negative impact of banking size increment. Like by the openings of new branches of banking sectors, the cost of banking sectors will increase. The cost of new branch of banks in a sense the rent of bank branch, the incomes of the employees, the electricity bills will have to be paid also the minimum current account ad liquidity ratio of the central banks need to be maintained. Moreover, the greater the number of branches the higher will be the availability of the walking customers. But after the covid -19 due to the transition of physical availability of the products into online by means of app and as well as zoom this situation goes against. In today, s world the people are directed towards cost cutting method for example I may give you the app and a team. The team supervised the functions and activities through apps. But opening bank branches is good for the ideal economy like you may open the new branch. It will need new employees, the accommodation for the products to move here and there but this needs the market conditions good and at booms. In a result we can state that for the opening of new banks there should be boom period of the market. Rather than the boom period it will have a negative impact.

Furthermore, the respondent was asked about its impact on GDP growth. To answer this question the official stated that the GDP is not directly concerned with banking sectors. But as far as banking and financial sector is concerned the exports will surge up. For example, the IT industry is running in the capital and many other major cities across the country. Call centers that

are USA or UK based that are not producing any products but they are giving services that is called service export and IT exports which create different software and sells it. So, in order to conclude the discussion for the said query the greater the number of tangible or non-tangible, physical or non-physical products the greater will be the inflow of dollars in to the country.

Likewise, the official was investigated regarding the impact of interest rate on bank risk. To clear this question the official argued that by increasing interest rate the risk factors will remains unchanged. But the indicator of increasing interest rate will be such that money will float freely in the market which will results in inflation rate to rise. In every country including Pakistan where there is inflation the profit rates and interest rate will increase. On other hand in case of emergency when the government lack money then government tends to increase interest rate.

Chapter 5

Conclusion and Policy Recommendation

5.1 Conclusion

This study fills the gap occur in empirical literature of the association of financial liberalization and bank risk for the country of Pakistan. The study associates all the aspects theoretically analysis occur, analysis occur empirically by taking into account useful insights into the unique problems faced by developing country like Pakistan to manage bank risk. By clarifying ideas about bank risk in the banking sector and, in specifically, by recognizing the underlying problems of distresses in that sector, the research expands knowledge. This empirical research contributes to the argument that a decline in the relative size of the bank is likely to result from improving macroeconomic conditions. In this research thesis, 3 different factors such as financial liberalization, banks characteristics which includes (liquidity, efficiency, capitalization, size, age) and macroeconomics variables which include (GDP, inflation rate and short run interest rate) were analyzed as determinants of the Bank risk for the country of Pakistan. The study uses data from the period of 2011 to 2020 for the panel of banking sector Moreover, the study uses panel unit root tests Haris T-Zavalis tests is used to check the stationarity of the data and Hausman tests techniques is used for fixed effect and random effect models from the methodology points in order to estimates the impact of financial liberalization on bank risk taking for in all Pakistani banks. The study uses four panel of banks. First the panel of all banks were check using Hausman test fixed effect model and the result indicate that financial liberalization has negative

effect on bank risk, second panel for commercial banks were check and the result reveals that independent variable financial liberalization have negative impact on bank risk. The third panel include islamic banks and the result shows that financial liberalization has negative effect on bank risk.

In addition to this banks characteristic shows that if there is financial liberalization in banking sector than liquidity will increase bank risk for panel the four panel, Efficiency may increase and in some panel of banks it can decrease bank risk. Bank size increase will decrease bank risk while macroeconomic factors such as GDP, inflation rate and short run interest rate determine banks efficiency and the overcoming of risk of banks in banking sector. Therefore, from this study we suggest that central authorities will contribute to banking sector in order to manage bank risk. The analysis of a few essential variables for the heterogeneity of this nexus reveals that state-owned banks, large banks, and older institutions are more likely to profit from financial liberalization. Additionally, a more favorable political situation as measured by effective law enforcement and stable governance may strengthen the influence of financial liberalizations on bank risk. A bank's ability to benefit from financial liberalization may be limited by an overly powerful government as measured by its spending. The study that the impact of government power indicates that financial liberalizations policies may have a degenerated negative impact on the quality of bank risk. As a result, central banks must consider this impact and slightly reduce government engagement in the economy.

5.2 Policy Recommendation

The study will suggest a policy which is drawn from the work finding which as assed. Empirically the study presented take model and techniques to determine the factor of Bank risk. From the finding of the research, it can show that there is need of such policy which is implement to prevent from high risk and control all the activity within the 26 banks in Pakistan banking sector. Financial liberalizations have a cost in terms of Pakistan's banking system's uncertainty. However, changes in the channels could also cause variations in Pakistan banking sector with respect to other countries. The advantages of financial liberalizations are especially beneficial to emerging nations. Financial liberalizations may therefore be more detrimental to emerging nations without institutions that are well-developed, where rising bank risk is not pulled down by the advantages of growth in general in the banking industry.

The performance of Pakistan's financial system has to be stabilized by political stability and effective governance. It is vital to strengthen the State Bank's capability for supervision and prudential rules. To improve financial intermediation in Pakistan, the local capital market has to be expanded and deepened. More variables should be incorporated in the model and should be evaluated using alternative techniques in the future for a deeper understanding and consequences of financial liberalizations and various macroeconomic variables.

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