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CREDIT RISK, ENERGY GAP AND INSTITUTIONAL INVESTORS: AN EMPIRICAL ANALYSIS ON PAKISTANI CONVENTIONAL BANKS

ABID MEHMOOD

Universiti Utara Malaysia

DOCTOR OF PHILOSOPHY

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CREDIT RISK, ENERGY GAP AND INSTITUTIONAL INVESTORS: AN EMPIRICAL ANALYSIS OF HE DETERMINANTS OF CREDIT RISK IN PAKISTANI CONVENTIONAL BANKS

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ABSTRACT

The stability of banking sector in Pakistan is relatively weak. Nonperforming loans (NPL) is one of the prime focus among Financial Stability Indicators (FSI). Empirical studies suggested that the factors affecting NPL can broadly be divided into external and internal elements. This study attempted to examine the selected factors from these elements as predictors of NPL for conventional banks. An unbalanced panel of 20 banks over a period of 12 years (2006-2017) with a total of 235 observations were formed. Panel corrected standard errors estimator (PCSE) was used to control the panel data issues. All identified factors were found to have significant influence on NPL. Specifically, energy gap, corruption, political instability as well as bank credit to private sector are the novel contributor to the variability in NPL. Besides, the hierarchical multiple moderated regressions were used to examine the moderating effects of the prevailing management structure in Pakistani banking sector. Based on the result, institutional investors (II) moderates all three internal factors namely capital adequacy ratio (CAR), loan-to-deposit ratio (LTD) and return on assets ratio (ROA). This study recommended that Pakistan should improve ownership structure in the banking sector in order to control the stake of institutional investors. Also, the regulators should devise policies with autonomy and responsibility to control corruption and political interference in lending. Lastly, the Pakistani government needs to ensure a conducive environment in which sufficient electrical energy can be properly supplied. This will facilitate the lending process of the lending sector to the affected sectors and indirectly help boost the country's economic growth.

Keywords: nonperforming loans, energy gap, corruption, political instability, institutional investors

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ABSTRAK

Kestabilan sektor perbankan di Pakistan adalah agak lemah. Pinjaman tidak berbayar (NPL) adalah salah satu fokus utama di antara Petunjuk Kestabilan Kewangan (FSI). Kajian empirik menunjukkan faktor-faktor yang mempengaruhi NPL boleh dibahagikan kepada unsur luaran dan dalaman. Kajian ini dijalankan bagi mengkaji faktor-faktor terpilih dari unsur-unsur ini sebagai peramal NPL bagi bank konvensional di Pakistan. Panel tidak seimbang untuk 20 bank selama 12 tahun (2006-2017) dengan sejumlah 235 pemerhatian telah dibentuk. *Panel Corrected Standard Errors Estimation* (PCSE) digunakan untuk mengawal masalah data panel. Semua faktor yang dikenalpasti mempunyai pengaruh yang signifikan ke atas NPL. Secara khusus, jurang tenaga, korupsi, ketidakstabilan politik serta kredit bank kepada sektor swasta merupakan penyumbang baru kepada perubahan NPL. Selain itu, regresi hierarki moderat berganda digunakan untuk menentukan pengaruh moderasi struktur pengurusan yang berlaku di sektor perbankan Pakistan. Berdasarkan hasil, pelabur institusi (II) menyederhanakan ketiga-tiga faktor dalaman iaitu nisbah kecukupan modal (CAR), nisbah pinjaman kepada deposit (LTD) dan nisbah pulangan atas aset (ROA). Kajian ini mengesyorkan Pakistan harus meningkatkan struktur pemilikan di sektor perbankan untuk mengawal kepentingan pelabur institusi. Selain itu, pembuat dasar harus merancang dengan autonomi dan tanggungjawab untuk mengawal rasuah dan campur tangan politik dalam pemberian pinjaman. Terakhir, kerajaan Pakistan perlu memastikan persekitaran yang kondusif di mana tenaga elektrik yang mencukupi dapat disalurkan dengan baik. Keadaan ini dapat melancarkan proses pemberian pinjaman yang mencukupi oleh sektor perbankan kepada sektor-sektor yang terlibat dan secara tidak langsung dapat membantu meningkatkan pertumbuhan ekonomi negara.

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Kata kunci: pinjaman tidak berbayar, jurang tenaga, rasuah, ketidakstabilan politik, pelabur institusi

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Universiti Utara Malaysia

TABLE OF CONTENTS

PERMISSION TO USE i
ABSTRACT ii
ABSTRAK iii
ACKNOWLEDGEMENT iv
TABLE OF CONTENTS v
LIST OF TABLES ix
LIST OF FIGURES x
LIST OF APPENDICES xi

CHAPTER ONE INTRODUCTION
1.1 Introduction 1
1.2 Background of the study 1
1.2.1 The Banking Sector of Pakistan and NPL 4
1.2.2 NPL and Macro-economic Factors in Pakistan 8
1.2.3 NPL & Macroeconomic Factors: A perspective through Energy Gap 19
1.2.4 NPL, NPL's Internal Factors and Institutional Investors in Pakistan 23
1.3 Problem Statement 26
1.4 Research Objectives 28
1.5 Research Questions 29
1.6 Scope and Limitation of the Study 30
1.7 Significance of the Study 31
1.8 Organization of the Thesis 32

CHAPTER TWO LITERATURE REVIEW
2.1 Introduction 34
2.2 Non-Performing Loans and its Ratio 34
2.3 External Factors 37
2.3.1 Annual Growth Rate of Gross Domestic Product (GDP) 38
2.3.1.1 Empirical Evidence on GDP 38
2.3.1.2 Critical Evaluation and Literature Gap 42
2.3.2 Lending Interest Rate (LIR) 42
2.3.2.1 Empirical Evidence on LIR 43
2.3.2.2 Critical Evaluation and Literature Gap 44
2.3.3 Unemployment Rate (UR) 47
2.3.3.1 Empirical Evidence on UR 47
2.3.3.2 Critical Evaluation and Literature Gap 48
2.3.4 Bank Credit to Private Sector (BCPS) 50
2.3.4.1 Empirical Evidence on BCPS 51
2.3.4.2 Critical Evaluation and Literature Gap 53
2.3.5 Energy Gap (EG) 55
2.3.5.1 Empirical Evidence on EG 55
2.3.5.2 Critical Evaluation and Literature Gap 55
2.3.6 Political Stability (PSI) 56
2.3.6.1 Empirical Evidence on Political Stability 57
2.3.6.2 Critical Evaluation and Literature Gap on Political Stability and NPL59

Universiti Utara Malaysia

2.3.7 Corruption (CCI) 60
2.3.7.1 Empirical Evidence on Corruption 61
2.3.7.2 Critical Evaluation and Literature Gap on Corruption and NPL 63
2.4 Internal Factors 65
2.4.1 Capital Adequacy Ratio (CAR) 65
2.4.2 Liquidity [Loan-to Deposit Ratio (LTD)] 70
2.4.3 Performance via Profitability [Return on Assets (ROA)] 73
2.5 Moderating Factor Institutional Investors (II) 77
2.5.1 Moderation on the relationship between CAR and Bank Risk Taking 79
2.5.2 Moderation on the relationship between Liquidity and Bank Risk Taking 80
2.5.3 Moderation on the relationship between Profitability and Bank Risk Taking 81
2.6 Related Theories 81
2.6.1 Theory of Financial Intermediation 82
2.6.2 The Agency Theory 84
2.6.3 Modern Portfolio Theory 86
2.7 Summary of the Chapter 88

CHAPTER THREE METHODOLOGY
3.1 Introduction 89
3.2 Research Design 89
3.3 Model Specification on Theoretical Basis 90
3.4 Operational Definition and Measurement 96
3.5 Hypotheses Development 98
3.5.1 External Factors 98
3.5.1.1 Gross Domestic Products (GDP) 98
3.5.1.2 Lending Interest Rate 99
3.5.1.3 Unemployment Rate (lagUR) 99
3.5.1.4 Bank credit to Private Sector (BCPS) 100
3.5.1.5 Energy Gap (lnEG) 100
3.5.1.6 Political Stability Index (PSI) 101
3.5.1.7 Corruption Control Index (CCI) 101
3.5.2 Internal Factors 102
3.5.2.1 Capital Adequacy (CAR) 102
3.5.2.2 Liquidity [Loan to Deposit Ratio (LTD)] 103
3.5.2.3 Profitability [Return on Assets (ROA)] 104
3.5.3 Moderating Variable 104
3.5.3.1 Institutional Investors 104
3.6 Panel Regression Models 107
3.6.1 Multiple Regression Models 107
3.6.2 Hierarchical Moderated Regression Model 108
3.6.3 Hierarchical Multiple Regression Test 109
3.7 Data Collection Procedures 110
3.7.1 Data Sources 111
3.7.2 Sample Selection and Unit of Analysis 111
3.8 Data Analysis 112
3.9 Summary of the Chapter 113

Universiti Utara Malaysia

CHAPTER FOUR RESULTS AND DISCUSSION

4.1 Introduction 114
4.2 Descriptive Statistics of Variables 114
4.3 Assumptions of Linear Regression Model 118
4.3.1 Normality Test 118
4.3.2 Multicollinearity Check 121
4.3.3 Criterion for Selection of Method of Analysis 126
4.3.4 Lagrangian Multiplier Test 127
4.3.5 Hausman Specification Test 128
4.4 Diagnostic Tests 130
4.4.1 Autocorrelation 130
4.4.2 Heteroskedasticity 131
4.4.3 Groupwise Heteroskedasticity Tests 133
4.4.4 Cross-Sectional Dependence Tests 134
4.5 Panel Multiple Regression Analysis 138
4.5.1 Rationale for Selection of Analysis Method 141
4.5.2 Comparison of Competing Analysis Methods 141
4.6 Selection of Panel Corrected Standard Errors (PCSE) Estimator for Regression Analysis, Results and Discussion 142
4.6.1 Relationship between External Factors and Non-performing Loans in Conventional Banks of Pakistan. 146
4.6.1.1 Gross Domestic Products (GDP) 146
4.6.1.2 Lending Interest Rate (LIR) 147
4.6.1.3 Unemployment Rate (lagUR) 147
4.6.1.4 Bank Credit to Private Sector (BCPS) 148
4.6.1.5 Energy Gap (lnEG) 149
4.6.1.6 Political Stability Index (PSI) 149
4.6.1.7 Corruption Control Index (CCI) 150
4.6.2 Relationship between Internal Factors and Non-Performing Loans in Pakistani Conventional Banks 151
4.6.2.1 Capital Adequacy Ratio (CAR) 151
4.6.2.2 Loan to Deposit Ratio (LTD) 152
4.6.2.3 Return on Assets (ROA) 153
4.6.3 Control Variables 153
4.6.3.1 Bank size 154
4.6.3.2 Loan Loss Provisions 154
4.6.4 The Summary of the Result of the Relationship between Independent Variables and Non-Performing Loans of Conventional Banks in Pakistan 155
4.7 Discussion on the Effects of Institutional Investors on the Relationship between Internal Factors and Non-Performing Loans 157
4.8 Hierarchical Moderated Multiple Regression Test Using PCSE Estimator 158
4.8.1 Model 1 161
4.8.2 Model 2 161
4.8.3 Model 3 162
4.8.3.1 The Moderating Effects of II on the Relationship between CAR and NPL 162
4.8.4 Model 4 164
4.8.4.1 The Moderating Effects of II on the Relationship between LTD and NPL 164
4.8.5 Model 5 166

Universiti Utara Malaysia

4.8.5.1 The Moderating Effects of II on the Relationship between ROA and NPL 167
4.8.6 Summary Results of the Moderating Model for Conventional Banks in Pakistan 168
4.8.7 Summary of Discussion on Results of the Moderating Models for Conventional Banks in Pakistan 171

CHAPTER FIVE CONCLUSION AND RECOMMENDATION
5.1 Conclusion 172
5.2 Recapitulation of the Findings 172
5.2.1 Objective 1 173
5.2.2 Objective 2 175
5.2.3 Objective 3 176
5.3 Contributions of the Study 178
5.3.1 Theoretical Contribution 178
5.3.2 Empirical Contributions 179
5.3.2.1 New Focus Area 179
5.3.2.2 New Findings 180
5.3.2.3 Institutional Investors as Moderating Variable 182
5.4 Implications of the Study 183
5.4.1 Policy Implications 183
5.4.2 Practical Implications 184
5.5 Limitation of the Study Scope and Limitation of the Study 185
5.6 Suggestion for Future Research 187

REFERENCES 188

Universiti Utara Malaysia

LIST OF TABLES

Table 1.1 Comparison of Pakistani Banks NPL Ratio with Other Countries 7
Table 2.1 Gross Domestic Product and NPL 41
Table 2.2 Lending Interest Rate and NPL 46
Table 2.3 Unemployment Rate and NPL 49
Table 2.4 Bank Credit to Private Sector and NPL 54
Table 2.5 Political Stability and NPL 58
Table 2.6 Corruption and NPL 64
Table 2.7 CAR and NPL 69
Table 2.8 Loan-to-Deposit Ratio and NPL 72
Table 2.9 Return on Assets and NPL 75
Table 3.1 Operational Definitions and Measurements 97
Table 4.1 Descriptive Statistics-all Variables for Conventional Banks in Pakistan .. 115
Table 4.2 Tests of Normality 118
Table 4.3 Skewness and Kurtosis Test 120
Table 4.4 Multicollinearity Diagnostic Test 122
Table 4.5 Multicollinearity Diagnostic Test for Models 1- Model 5 123
Table 4.6 Pearson Correlation Matrix 124
Table 4.7 Pearson Correlation Matrix for Interaction Models 1-5 125
Table 4.8 Breusch-Pagan Lagrangian Multiplier Test for Random Effects VS Pool Effect 127
Table 4.9 Hausman Specification Test for Random Effect VS Fixed Effect 128
Table 4.10 Wooldridge Test for Serial Correlation in the Panel Data of all Models 131
Table 4.11 Breusch-Pagan/ Cook-Weisberg Test for Heteroskedasticity in all Models 132
Table 4.12 Modified Wald Test for Groupwise Heteroskedasticity for all Models .. 133
Table 4.13 Pesaran CD Test for Cross-Sectional Independence for all Models 136
Table 4.14 Frees Test for Cross-Sectional Independence for all Models 137
Table 4.15 Panel corrected standard errors estimate for Pooled Model 144
Table 4.16 Summary of Multiple Regression (PCSE) Results of External and Internal Factors on Non-Performing Loans for Conventional Banks in Pakistan. 156
Table 4.17 The Moderating Effects of II on Internal Factors and NPL (using PCSE estimator) for Conventional Banks in Pakistan. 160
Table 4.18 Summary of the Results of Internal Factors only (Model 1), Internal Factors with Moderator as Internal Factor (Model 2), and Moderations of CAR*II (Model 3), LTD*II (Model 4), ROA*II (Model 5) 169
Table 4.19 Summary Results of the Moderating Effects on the relationship between Internal Factors and Non-Performing Loans for Conventional Banks in Pakistan. 170
Table 4.20 Summary of Hypotheses Test Results of the Effects of II on the Relationship between Internal Factors and Non-Performing Loans for Conventional Banks in Pakistan. 171

UUM Universiti Utara Malaysia

LIST OF FIGURES

Figure 1.1 Gross Non-Performing Loans.....5
Figure 1.2 Non-Performing Loan Ratio (NPL) and its Trendline 7
Figure 1.3 Impact of Economic Growth on NPL Ratio.....9
Figure 1.4 Impact of Lending Interest Rate on NPL Ratio.....10
Figure 1.5 Impact of Unemployment Rate on NPL Ratio 11
Figure 1.6 Impact of Energy Gap on NPL Ratio 13
Figure 1.8 Impact of Bank Credit to Private Sector (% of GDP) on NPL Ratio.....15
Figure 1.9 Impact of Political Stability Index (PSI in percentage) on NPL Ratio.....17
Figure 1.10 Impact of Control of Corruption Index (CCI in percentage) on NPL Ratio 18
Figure 3.1 The Conceptual Framework for NPL Determinants of conventional Banking in Pakistan 94
Figure 3.2 The Related Theories Model with Conceptual framework 95
Figure 3.3 The Moderating Effect Model.....110
Figure 4.1 The moderating effect of II on the relationship between CAR and NPL for Conventional banks in Pakistan. 163
Figure 4.2 The moderating effect of II on the relationship between LTD and NPL for Conventional banks in Pakistan. 166
Figure 4.3 The Moderating effect of II on the relationship between ROA and NPL of Conventional banks in Pakistan. 168

Universiti Utara Malaysia

LIST OF APPENDICES

Appendix A : List of Banks Mergers/Acquisitions in Pakistan during 2006-2015....229
Appendix B : The Sources of Data Collection for Each Variable 230
Appendix C : Sector Wise List of Banks 231
Appendix D : Official Mail Image of Receiving Energy Data 232

Universiti Utara Malaysia

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The chapter starts with general background of the study on non-performing loans (NPL) and moving on to importance of banking sector in Pakistani economy in section 1.2.1. The NPL situation and issues with reference to selected macroeconomic variables are discussed in section 1.2.2 and NPL issues with respect to selected bank-specific factors are discussed in 1.2.3. The problem statement, research objectives and research questions are presented in section 1.3, 1.4 and 1.5 respectively. The scope and limitation are discussed in section 1.6. The significance of the study is discussed in Section 1.7 and the Section 1.7 concluded with how this thesis is organized.

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1.2 Background of the study

A country's economy depends on its banking sector. In the contemporary world, the financial institutions are the backbone of the economy and their vital role cannot be ignored (Waqas, Fatima, Khan, & Arif, 2017); particularly in developing countries, banks are the main source of credit (Raza, Jawaid, & Shafqat, 2013). The capital markets have little ability to provide adequate sources of loan for investors because it is limited and relatively weak in developing countries (Saci, Giorgioni, & Holden, 2009; Tang, 2006). The intermediary role of banks in the supply and demand of funds furthers its importance where public savings are grouped and converted into investments through loans.

The loan portfolios are the main earning assets of banks (Niu, 2016) and lending is the main activity of banking institution (Kargi, 2011). Therefore, a bank tries to utilize maximum of its funds for lending (Malimi, 2017), nevertheless banks get some of its loans converted into risk of non-performing loans (NPL). The NPL represents credit risk (Chan, Karim, Burton, & Aktan, 2014; Malimi, 2017) in the balance sheets of the banks. The credit risk represents the chance of total or partial loan loss due to risk of default (Basel Committee on Banking Supervision[1], 2000). Whereas according to International Monetary Fund (2004) Financial Soundness Indicators Guide NPL are:

"A loan is nonperforming when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full." (p. 57)

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According to central bank of Pakistan named State Bank of Pakistan (SBP) "NPL are loans and advances whose markup/interest or principal is overdue by 90 days or more from the due date" (State Bank of Pakistan, 2008).

NPL, therefore are undesirable output that also represent credit risk. The credit risk dominance is apparent in capital adequacy ratio (CAR) where heavy portion of capital (70 percent) is allocated for only credit risk (Bhattacharya & Sinha Roy, 2008). The economic

[1] The Basel Committee on Banking Supervision (BCBS), also called Basel committee, is the primary global standard setter for the prudential regulation of banks and provides a forum for cooperation on banking supervisory matters. Its main objective is to achieve and extend financial stability through various supporting activities.

activity suffer decline through NPL which crowd out funds that could otherwise be used for productive investments (Nikolopoulos & Tsalas, 2017). NPL are thought to be as "financial pollution" due to its negative economic impact (Zeng, 2012). NPL are also the major reason of failures of banks (Campbell, 2007), and the most visible risk faced by banks (Fraser, Gup, & Kolari, 2001).

NPL are a common cause of banking crisis. During the period of 1970 – 2007, there are more than hundred and twenty banking crises where sharp rise in NPL was observed and it costed huge loss to banking sector capital (Laeven & Valencia, 2008) which could lead to bank insolvency[2]. In 2008, NPL in banks and mortgage companies increased the burden of debt while they continue aggressive lending that resulted in the bankruptcy of Lehman Brothers Holdings in the year which later proved to be the beginning of Global Financial Crisis (GFC) (Swedberg, 2010). Small and Medium Enterprises (SME) mainly depend on loans for their business showing the pivotal importance of banks in developing economies (Ikram & Su, 2015). In fact, NPL issue is critical to the survival of banking institutions (Saba, Kouser, & Azeem, 2012).

In addition, banking crises have significant costs. It claims, in developing countries, sizeable portion of gross domestic product (GDP) to set free their banking institutions. In some crises like what happened in Argentina and Mexico, banking crises cost 50 percent and 20 percent of their GDP respectively (Honohan & Klingebiel, 2000). High NPL ratios reduces banks' profits and looks odd on banks' balance sheets (Balgova, Nies, &

[2] Bank Insolvency is for some reason the bank may end up owing more than it owns or is owed.

Plekhanov, 2016). Thus, NPL existence on the balance sheet show its weakness via deteriorated assets quality that makes banking system fragile (Kwack, 2000). They reduce lending growth, miss investing in the good projects through loans, hit customer confidence and cause decline in growth of economy (Balgova *et al.*, 2016; Cucinellli, 2015; Jorda, Schularick, & Taylor, 2012; Kwan & Eisenbeis, 1995; Peek & Rosengren, 1997). Also, it is one of the financial stability indicators and it shows both credit and operational risks and also exhibits efficient allocation of resources. Therefore, determining the factors that influence NPL are of prime importance.

1.2.1 The Banking Sector of Pakistan and NPL

Pakistan is a developing country and it seeks to build an efficient economic system capable of distributing resources justly. The banking sector in Pakistan is the fairly developed and moderate sector (State Bank of Pakistan, 2015). Due to weak capital market and limited secondary market, the banks of Pakistan play a primary role in the field of investment and finance, (Fraser *et al.*, 2001). The banks cover 95 percent of the financial sector in Pakistan (Ahmad, 2011). Also assets of banks comprise of 74% of total assets of the financial sector (Azam Ali, Zulkhibri, & Kishwar, 2019) and it brings the banking sector at the forefront to fill the gaps due to underdeveloped financial markets. The ratio of banking sector total assets to GDP on an average is about 48 percent (State Bank of Pakistan, 2015). The banking sector total assets have been growing over the years and likewise the equity and liabilities which are mainly attributed due to increase in the size of the banking sector balance sheet that highlights its increased role in stimulating the economic growth in Pakistan. The increasing percentage growth rate in banking deposits requires the active

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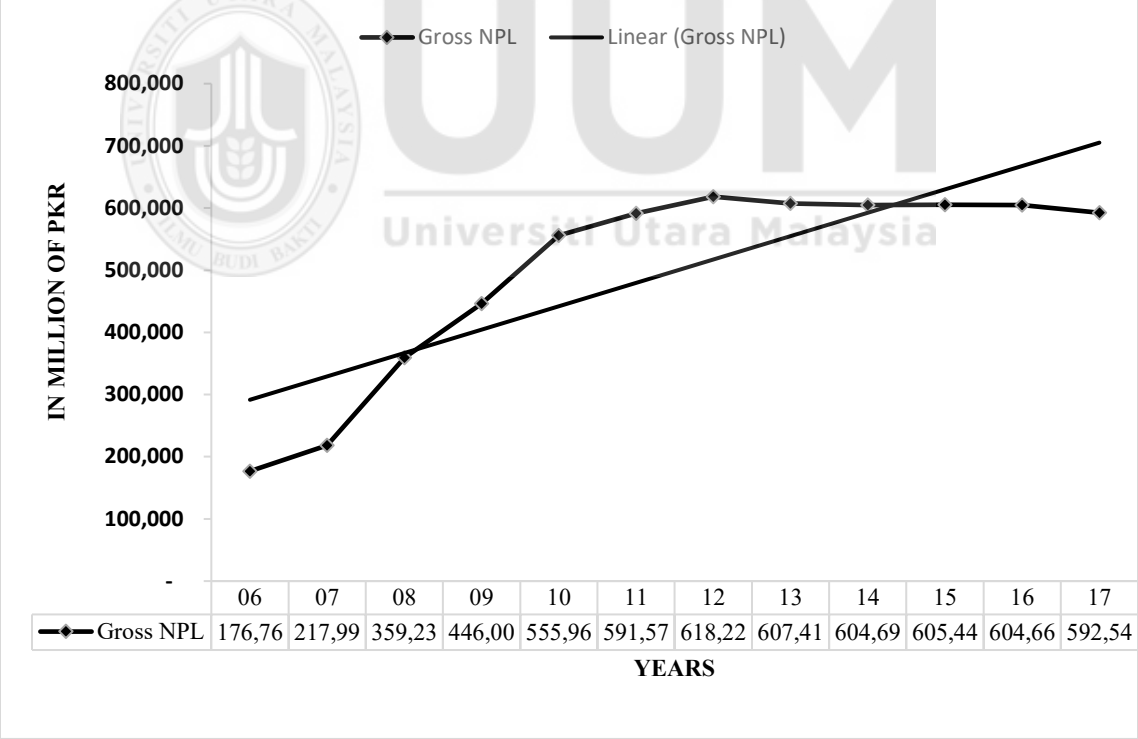
intermediary role of banks in channelizing deposits into loans which are merely around 50 percent of deposits in 2015 whereas loan to deposit and NPL ratios are moving in tandem showing a decreasing trend. It is due to the pileup and the exceeding of NPL from a certain level (Figure 1.1). Badar & Javid (2013) pointed out that NPL are growing rapidly in Pakistan in the last ten years.

The high value of NPL has predicting power of bank failure (Balgova *et al.*, 2016; Barr, Seiford, & Siems, 1994; Gonzales-Hermosillo, 1999; Lu & Whidbee, 2013). In Pakistan, the gross NPL are increasing as shown in the Figure 1.1.



	06	07	08	09	10	11	12	13	14	15	16	17
Gross NPL	176,76	217,99	359,23	446,00	555,96	591,57	618,22	607,41	604,69	605,44	604,66	592,54

Figure 1.1
Gross Non-Performing Loans
Source: Various Quarterly Compendia 2006-2017, SBP

The stock of NPL almost remained unchanged from 2013 to 2017 (i.e. at PKR(Pakistani Rupees) 692.5 billion at the end of 2017) (Figure 1.1) despite banks continue to increase provisions against NPL (State Bank of Pakistan, 2017). This represents inability of banks to recover or write off increased bad loans (State Bank of Pakistan, 2017) at the cost of profitablity and risk of solvency.

The banking sector credit risk in Pakistan is measured by the nonperforming loans ratio (NPL) and is also called infection ratio (State Bank of Pakistan, 2010). NPL ratio has been showing either increasing trend or above a certain level during the years 2006-2017 (Figure 1.2). The exceeding of NPL from a certain level is also not good for the banking sector and it could continue to plague banking system (Mohsni & Otchere, 2014).

In Pakistan, NPL ratio is increasing from 2006 onwards and it reached at the maximum in 2011 (15.74%) and it is still high at 8.43% (Figure 1.2) in 2017. Now if Figure 1.1 and Figure 1.2 are compared, it is evident that there is an very little change in the value of gross NPL while for the same duration (Figure 1.2) the ratio of nonperforming loans over total loans is decreasing. It means that either total loans is increasing or NPL are decreasing or both is happening that is dragging NPL ratio down.

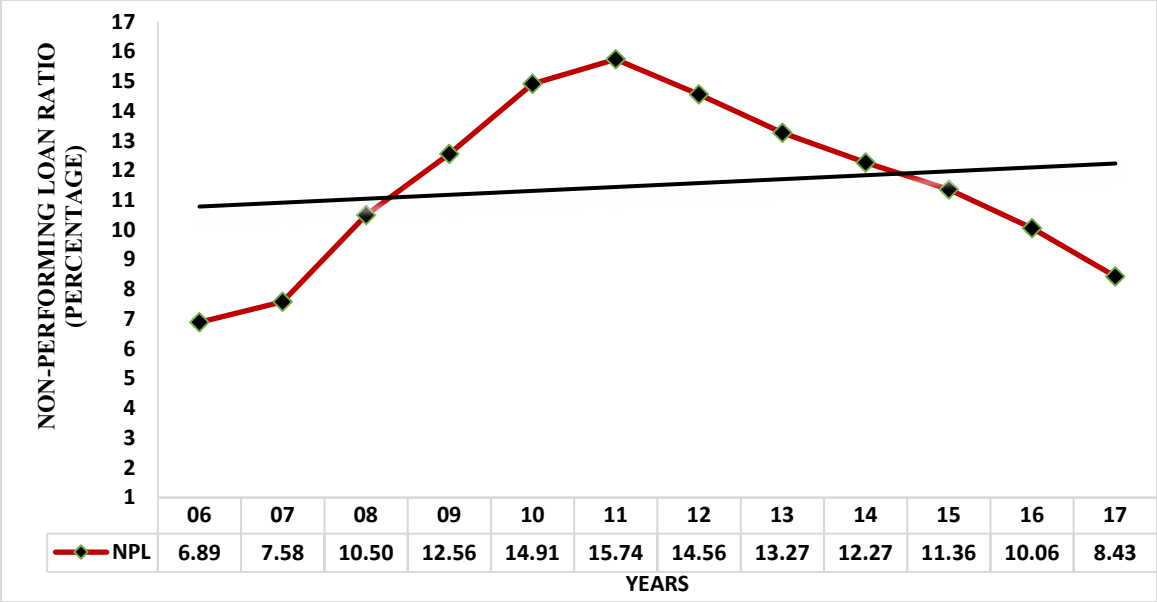


Figure 1.2
Non-Performing Loan Ratio (NPL) and its Trendline
Source: Various Quarterly Compendia 2006-2017, SBP

The reason for the increase in total loans could be due to both government bank borrowing and reducing the bank credit to the private sector. It is reflected in the value of NPL as Pakistan has the highest NPL among the countries of the region (Table 1.1) and also it is above the threshold of 10% of NPL ratio (Demirgüç-Kunt & Detragiache, 1998) which points that this issue needs immediate attention in Pakistan.

Table 1.1
Comparison of Pakistani Banks NPL Ratio with Other Countries

S#	Country	NPL Ratio						
		2011	2012	2013	2014	2015	2016	2017
1	Pakistan	16.21	14.47	12.99	12.27	11.36	10.06	8.43
2	Bangladesh	5.85	9.73	8.64	9.37	8.40	8.86	8.9
3	India	2.67	3.37	4.03	4.35	5.88	9.19	9.98
4	Malaysia	2.68	2.02	1.85	1.65	1.60	1.61	1.55
5	Sri Lanka	3.82	3.63	5.58	4.23	3.24	2.63	2.5

Source: Financial Soundness Indicators (International Monetary Fund, 2017)

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Due to high pile-up and exceeding of NPL from a certain level in the recent past, the Pakistani banking sector has witnessed several cases that were near to bankruptcy but somehow with the intervention of central bank (SBP), either these banks are merged into or are acquired by another financially sound bank. There are eight mergers in the banking sector during 2006-2017 (Competition Commission of Pakistan (CCP), 2017).

1.2.2 NPL and Macro-economic Factors in Pakistan

High NPL could lead to banking, financial and also economic crises (Benazić & Radin, 2015; Lleshanaku, 2015). Moreover, high NPL lead to an episode of distress to be classified as a full-fledged crisis is when the ratio of NPL in the banking system exceeds 10% (Demirgüç-Kunt & Detragiache, 1998). In 2014, out of 32 countries Pakistan was at 25th place that have NPL over 10% of total loans (Balgova *et al.*, 2016) while its NPL ratio in 2017 was around 9%. Thus, this situation is indicating NPL can trigger a banking, financial or economic crisis in Pakistan.

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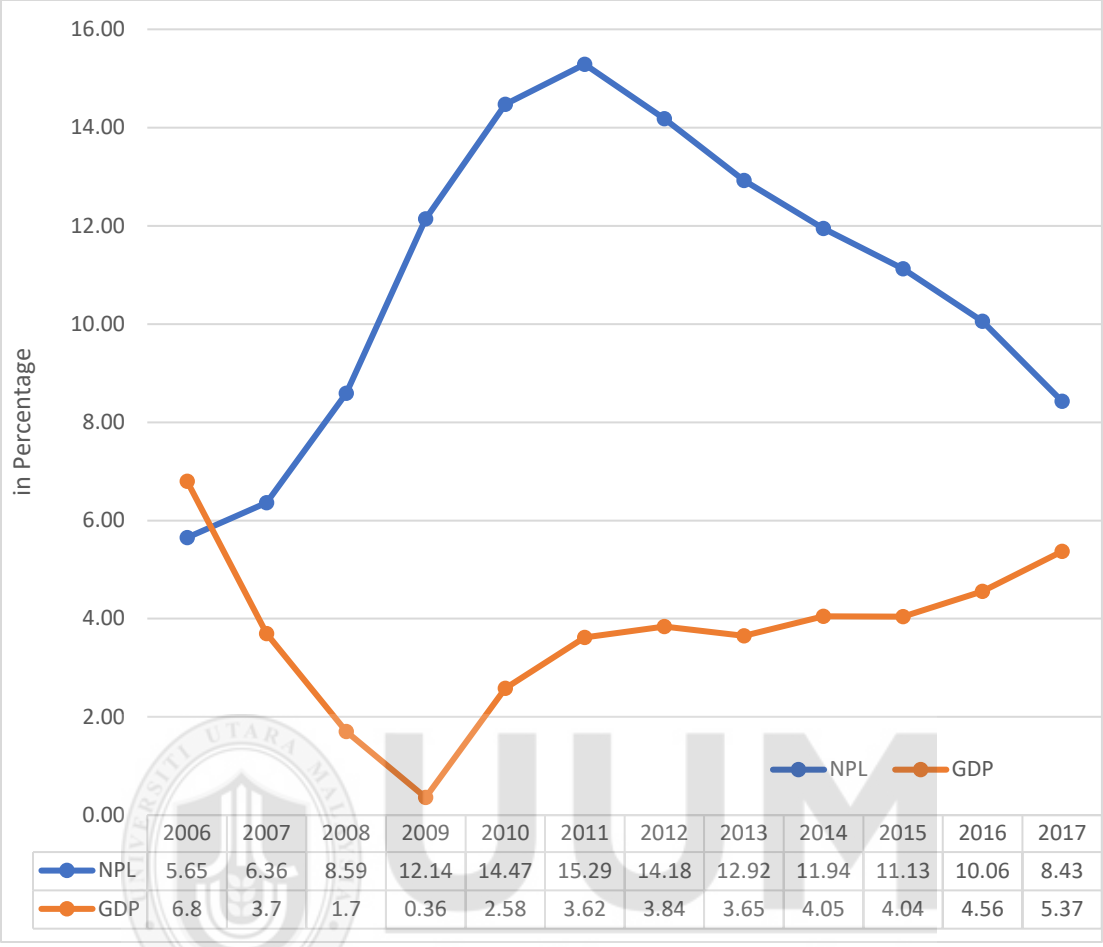
The annual gross domestic product growth rate (GDP) is an indicator of the overall economic activity. Economic boom (expansion) cause rise in income through higher employment which lower financial distress on borrowers and enable them to service their debts which will reduce NPL for banks (Makri, Tsagkanos, & Bellas, 2014).



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NPL	5.65	6.36	8.59	12.14	14.47	15.29	14.18	12.92	11.94	11.13	10.06	8.43
GDP	6.8	3.7	1.7	0.36	2.58	3.62	3.84	3.65	4.05	4.04	4.56	5.37

Figure 1.3
Impact of Economic Growth on NPL Ratio
Source: Author's Compilation from Pakistan Economic Survey (Various Issues) and State Bank of Pakistan (2006-2017)

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Conversely, the recession (economic) deteriorates income level due to increase in unemployment (Badar & Javid, 2013; Chaibi & Ftiti, 2015). Moreover, banks behave quite pessimisticly during recession and they decrease lending and increase provisioning for loan losses and start worrying about increased NPL. The countercyclical behavior of banking NPL are validated and could induce procyclicality in the financial system by further worsening the economic cycles. In Pakistan, the impact of GDP on NPL can be seen based on actual data (Figure 1.3).

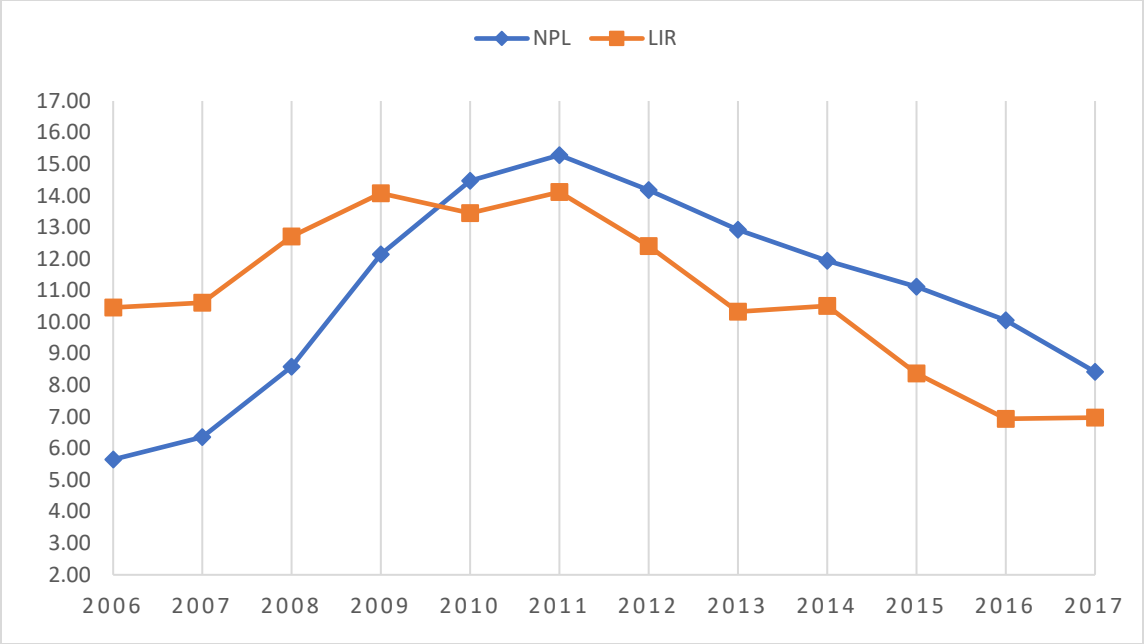

Figure 1.4
Impact of Lending Interest Rate on NPL Ratio
Source: Author's Compilation from Pakistan Economic Survey (Various Issues) and State Bank of Pakistan (2006-2017)

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Also, during economic recession, banks increase interest rates on the lending that will increase the cost of loan for borrowers by rising the interest payment and it will make debt servicing more expensive for all borrowers including quality borrowers (Nassreddine, Fatma, & Anis, 2013). This will give rise to number of loan defaults and hence the NPL. According to Espinoza & Prasad (2010), when economy is going down and interest rates are going high, NPL will rise. Since Pakistan depends on International Monetary Fund (IMF) to get support in its fiscal deficit, IMF loans bound the movement of interest rate (Rehman, Zhang, & Ahmad, 2016). How average annual lending interest rate influence NPL in Pakistan is shown in Figure 1.4 based on actual data. It shows peculiar results that at high interest rates NPL were low and by increase in interest rates, initially NPL increased and later starts decreasing with decrease in interest rates.

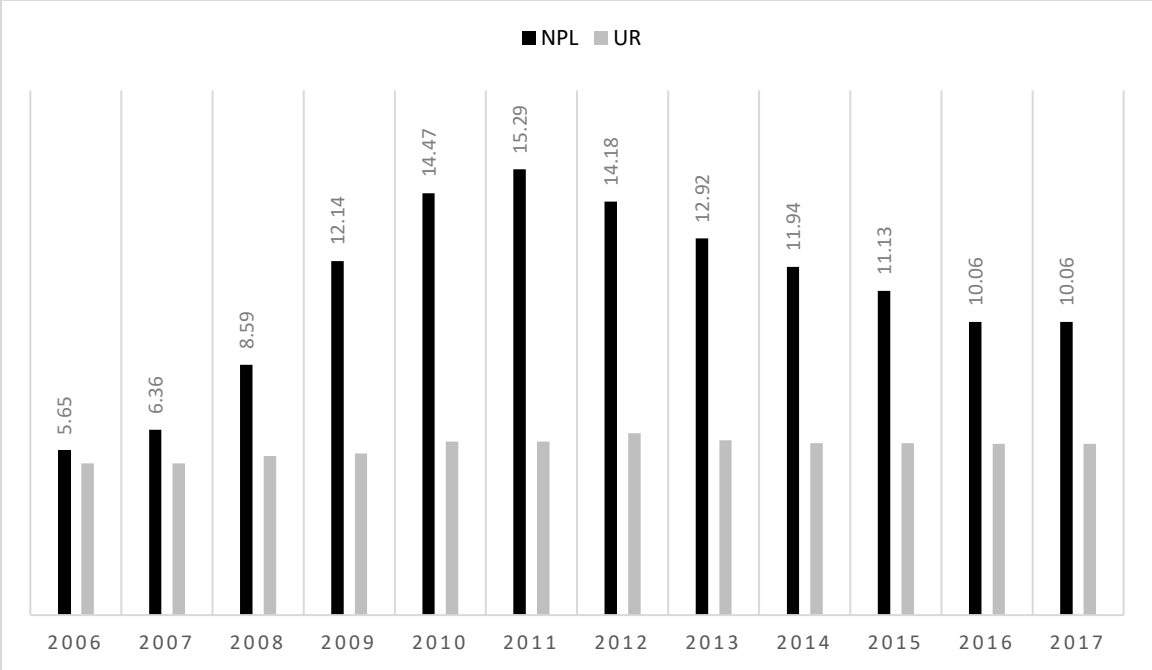

Figure 1.5
Impact of Unemployment Rate on NPL Ratio
Source: Author's Compilation from Pakistan Economic Survey (Various Issues) and State Bank of Pakistan (2006-2017)

Similarly, during economic growth swings, there will be increase in productions due to increased demand and it requires more workers at job at competitive income levels. Therefore, there will be low unemployment rate with greater paying capacity to manage and pay their loans which will result in decrease of NPL (Bofondi & Ropele, 2011).

While on the other hand, during economic downturns there will be less production as a result of declined demand. This will end up in decrease of revenues that will lead to more lay-offs or decrease in the income of work force. Thus, the borrowers with meagre earnings have greater chances of default due to higher probability of losing their jobs and because of the unemployment they would not be able to repay their loans. This would also give rise to the rate of unemployment that could also have negative impact on the current and future

purchasing capacity of the households and it consequently would give hike to the debt burden. Therefore, it will give rise to NPL stock.

The energy (electricity) shortage (the difference of demand and supply of electricity), in recent years, has worsened in developing countries around the world. Energy has prime importance in the growth process of economy. Energy helps economic activity to increase that in turn increases output growth in an economy. Similar to other factors of production in the production function like capital and labor, energy is also very important input (Shahbaz, 2015).

Moreover, due to continued deteriorating economic conditions in Pakistan, the establishment of new sources of energy generation was neglected by political governments in Pakistan which helped widening the energy gap in terms of difference in demand and supply of electricity (energy). This created a hurdle in economic growth of the country and it led to running the industry below the capacity which gave rise to the cost of production that effectively impacted the loan repaying capacity of both businesses and individuals that in turn increased the NPL level as shown in the Figure 1.6. This also increased the unemployment in the country which also caused pile-up of bank credit. The leading evidence builds a pressure and damage paying capacity of domestic firms and industries, resulting in a rise in NPL on the banks' balance sheets (State Bank of Pakistan, 2015).

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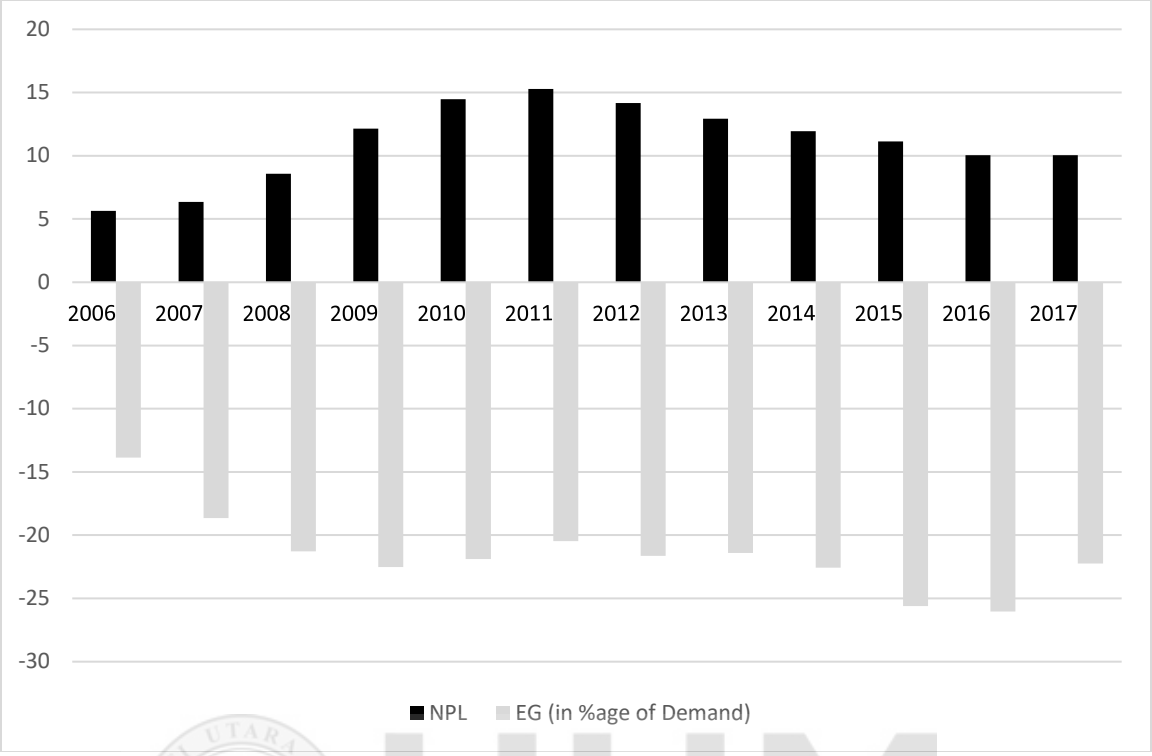

Figure 1.6
Impact of Energy Gap on NPL Ratio
Source: Author's Compilation of data from National Transmission & Dispatch Company (NTDC), Water & Power Development Authority (WAPDA) Pakistan and State Bank of Pakistan (2006-2017)

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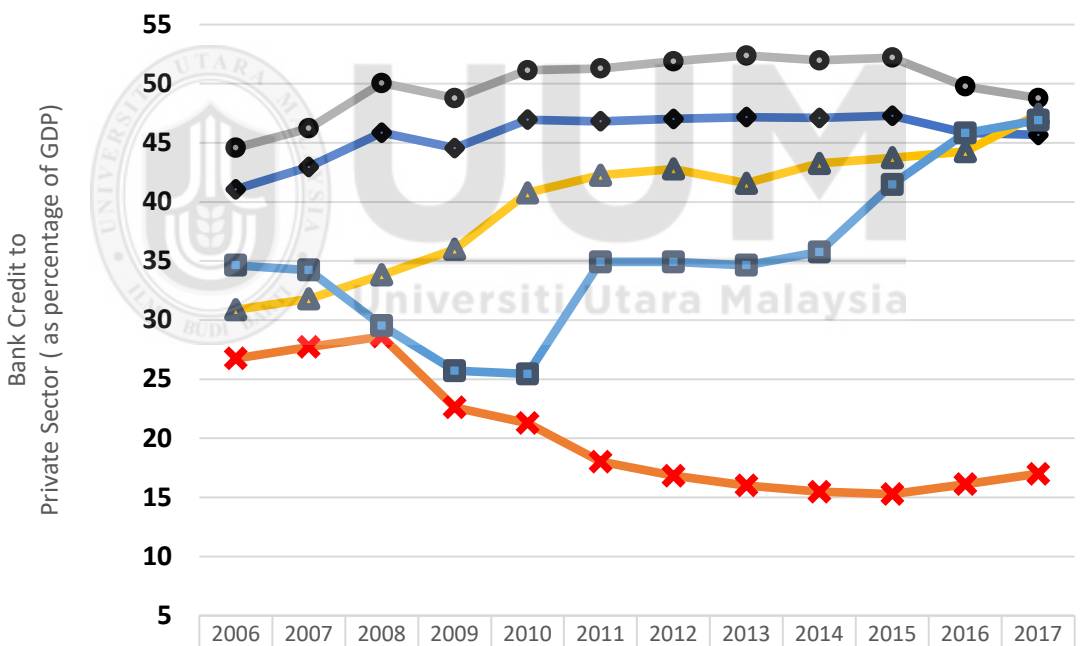
Keeton & Morris (1987) concluded that rise in NPL are due to poor economic conditions with bad performance of energy and agriculture sector. In another study based on banker's perceptions, energy crisis has a significant relationship with NPL in Pakistan (Farhan, Sattar, Chaudhry, & Khalil, 2012). A replica study based on the perceptions of the bankers in Nepal concludes similar results (Bhattarai, 2014). Thus, it shows that widened energy gap will result in poor business environment resulting in high cost of business and increase in NPL.

Bank credit to private sector (BCPS) means meeting the financing and credit needs of the private sector of an economy by its banks. The Pakistani economy is also suffering due to

inadequate finances from banks for the new projects and it caused a number of defaults. The government bank borrowing for budgetary deficit has recently shifted from central bank to conventional banks and it created an impact of crowding out private sector credit (Zaheer, Khaliq, & Rafiq, 2017). Therefore, the banks lend lesser to the private sector and that is mostly for their working capital requirements of businesses. It is reducing the NPL ratio in the short run while it will increase it in the long run when private sector projects could not be completed due to a shortage of required finance from banks, it would default against their loans because these projects will no more be able to generate revenues to repay



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
South Asia	41.07	42.96	45.85	44.55	46.95	46.81	47.01	47.18	47.10	47.29	45.84	45.66
Pakistan	26.76	27.74	28.60	22.62	21.29	18.03	16.84	16.02	15.49	15.28	16.12	17.00
India	44.57	46.22	50.06	48.78	51.14	51.29	51.89	52.39	51.98	52.21	49.77	48.78
Bangladesh	30.88	31.79	33.82	35.99	40.77	42.26	42.78	41.58	43.26	43.73	44.26	47.41
Sri Lanka	34.64	34.23	29.53	25.71	25.44	34.91	34.92	34.64	35.75	41.48	45.82	46.91

Figure 1.7
Bank Credit to Private Sector (% of GDP)
Source: World Bank Data (2006-2017)

their loans. A comparison on the BCPS of regional countries is exhibited in Figure 1.7 to reflect Pakistan's BCPS which showed it is comparatively very low. While based on real data its impact on the levels of NPL are shown in Figure 1.8.

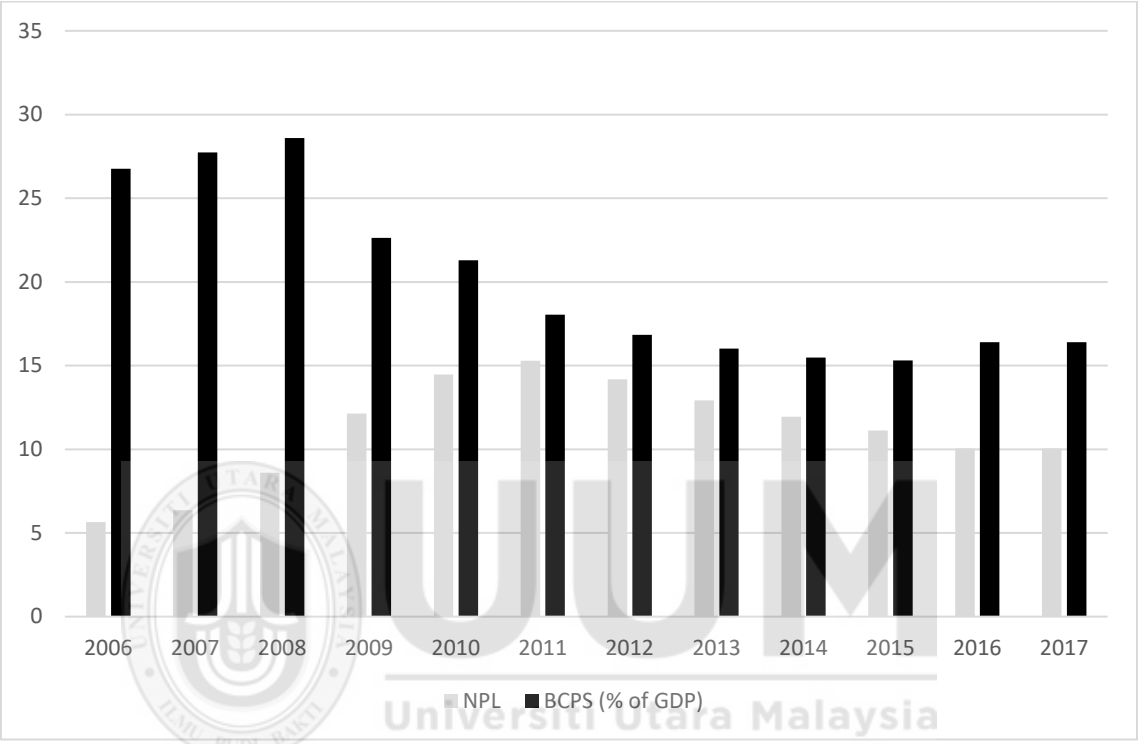


Figure 1.8
Impact of Bank Credit to Private Sector (% of GDP) on NPL Ratio
Source: World Bank and State Bank of Pakistan (2006-2017)

This current economic situation of Pakistan also made the NPL recovery rate too low to stuck up about 25% of its loans (State Bank of Pakistan, 2015). Due to weak performance economic fundamentals like high unemployment and interest rates, political instability and corruption, all had played their role in slowing down the recovery of economy of Pakistan to the best (State Bank of Pakistan, 2015). A large number of loans were approved to the borrowers from the private sector on mere political considerations and not based on the best proposed projects on the merit (State Bank of Pakistan, 2015). These politically lifted

borrowers rarely pay back their loans and the cash recoveries against NPL started decelerating after 2013 (State Bank of Pakistan, 2015).

Political stability index (PSI) and control of corruption index (CCI) are included in world governance index and considered as determinant of NPL in the literature (Bougatef, 2015; Citron & Nickelsburg, 1987; Goel & Hasan, 2011). Corruption and political stability usually found together in the growth in NPL. This growth in NPL can be because of the political influence of the lenders (Khwaja & Mian, 2005). Political stability is a channel of corruption growth as Mo (2001) divides the corruption-growth process and it infiltrate through three channels which are first the investment channel, second a human capital channel, and third is a political stability channel. Support also exists for the notion that political instability heightens the effects of corruption on accumulation of NPL (Shaffer, 2008).

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Lending decisions are influenced by various interest groups who create the pressures via political lobbying. Thus the enterprises with good political support will succeed in getting their loans approved even in severe distress, which could be of lower quality (Boudriga, Taktak, & Jellouli, 2008). In Pakistan, the firms which are well connected politically get significant preferential treatment. Thus, such firms not only enjoy 45% greater loans, but also they have 50% more loan default rate (Khwaja & Mian, 2005). Pakistani data shows that when political stability is low, the level of NPL are high and vice versa (Figure 1.9).

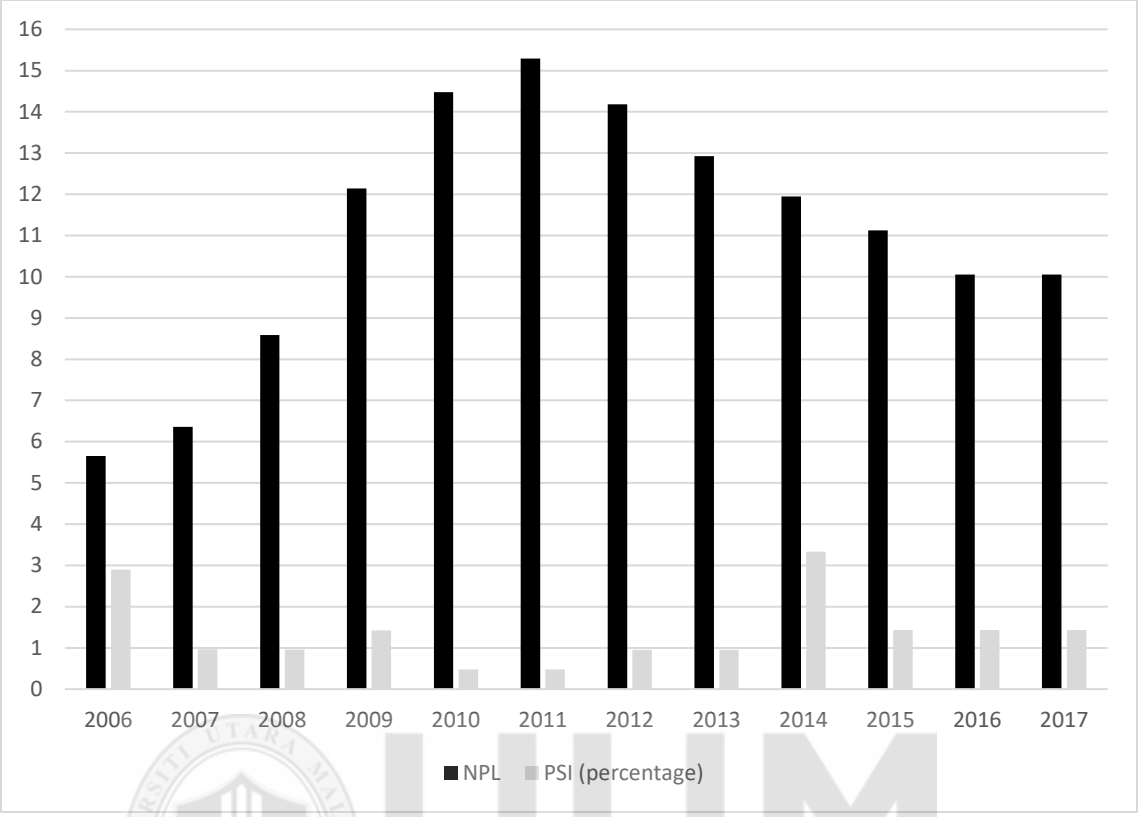

Figure 1.9
Impact of Political Stability Index (PSI in percentage) on NPL Ratio
Source: World Governance Indicators, World Bank & State Bank of Pakistan (2006-2017)

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Corruption is generally more destructive in the presence of political instability. This can be at macroeconomic level, political corruption and inside institutions corruption. It is the most probable for a country to have a very corrupt banking sector that has its public sector mostly corrupt (J. Park, 2012). Corruption decreases bank soundness and makes the banking system even weaker, and thus puts a country to fall prey of a financial crisis. Corruption alters the priority of bank funds allocation to bad projects from normal projects and as a result it worsens the levels of banking sector NPL (J. Park, 2012).

East-Asian financial crises 1997–1998 exposed that the widespread corruption add fuel to the financial crises. The typical example of South Korean Hanbo corporation revealed the fact that extraordinary linkages of politicians with corporations have deteriorated seriously asset quality of banks that finally led to the financial crisis. Figure 1.10 shows that when

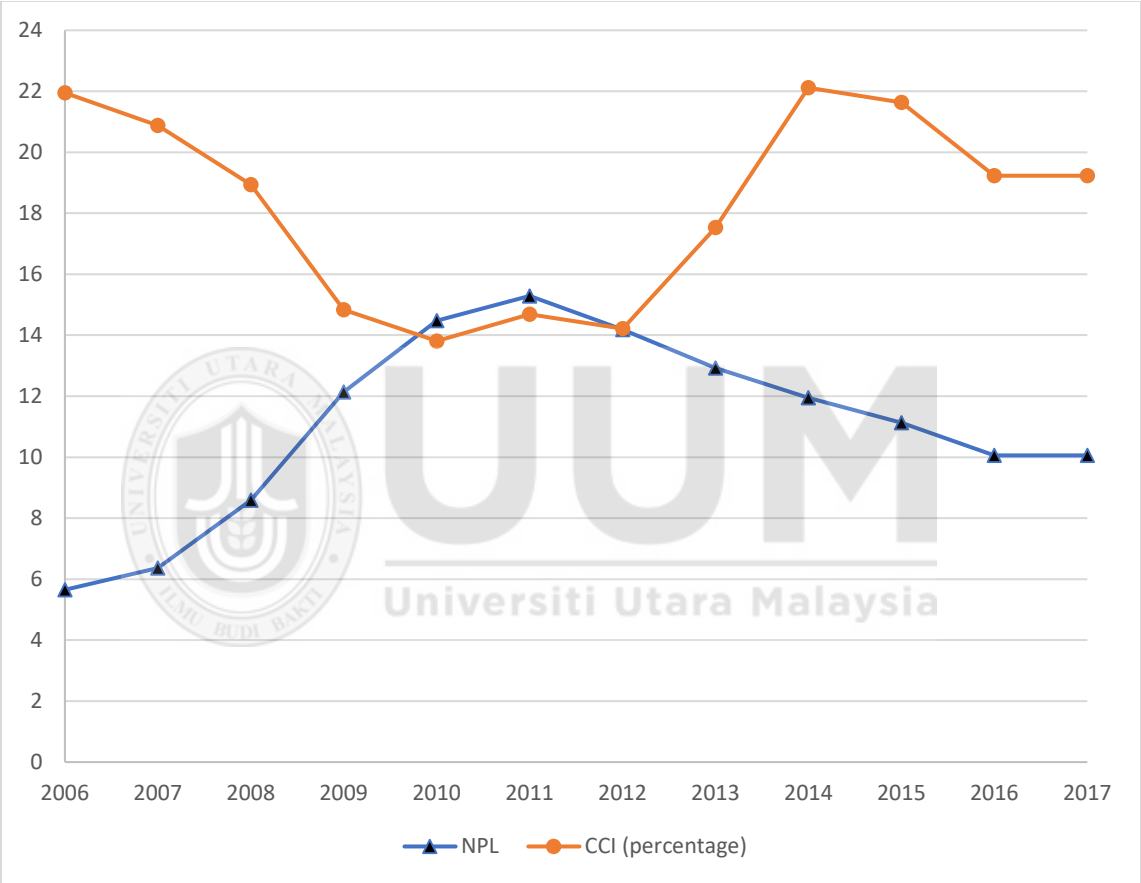

Figure 1.10
Impact of Control of Corruption Index (CCI in percentage) on NPL Ratio
Source: World Governance Indicators, World Bank & State Bank of Pakistan (2006-2017).

corruption index is high (cleaner from corruption) NPL are low which is based on the actual data of Pakistan.

1.2.3 NPL & Macroeconomic Factors: A perspective through Energy Gap

Energy is an input that is important in gearing the economic activity like other inputs such as capital and labor. Energy gap (the percentage difference between demand and supply of electricity with respect to demand) is one of the biggest problems faced by Pakistan and bad performance of energy sectors in the form of widening this gap along with poor economic conditions are the main factors causing NPL (Keeton & Morris, 1987) in Pakistan.

The positive or negative variation in energy demand or supply influence positively or negatively the real GDP and vice versa as per feedback hypothesis. Thus, long run economic development can be sustained with uninterrupted continuous supply of energy. While amongst the external factors, the energy gap is increasingly gaining importance due to its potential of affecting the macroeconomic environment in general to all sectors and eventually to the banking sector while specifically its' NPL.

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The energy demand and supply gap has been increasing enormously over time since its start in 2006-2007. The situation continued towards the worst and in 2009 just after two years only the gap spread to the power outage of 30% of demand. In next two years (i.e. in 2010-2011) the gap reached over the level of 5000 megawatts (MW) and later at over 7000 MW and its influence can be seen in the level of NPL during the year 2011. Electricity supply shortened by 8,500 MW during 2012 summer that comprises over 40% less than the demand (Dawn, 2012). A roster of power outage having more than 8 hours in cities and

more than 16 hours in villages was adopted (WAPDA, 2010) which influenced the economy in many ways and cause sharp increase in the levels of NPL.

This situation hindered the economic activity and production declined sharply in all industries. Agriculture and services sector also not spared from this curse. The consequences reported in economic loss of over $3.8 billion in 2009 which is sizeable compared to the economy. A huge loss of US$1.3 billion exports and thousands of workers lost their jobs while it was a meagre portion of start of a big problem. A large number of factories reportedly faced forced closure jeopardizing production and adding to rate of unemployment (Siddiqui, Jalil, Nasir, Malik, & Khalid, 2011). Other important consequence resulted in the form of social unrest due long hours of power outage that shocked the common people and brought them on protests and riots where properties either public or private are either broken or set on fire by these violent mobs. USAID and Planning Commissions of Pakistan calculated a total of 10% of GDP lost in previous five years while the loss in exports are PKR.210 billion and USD$1 billion reported by Ghaus-pasha (2009). In this situation, exporters could not even fill their orders that resulted in loss of business. These shocks to the economy cause increase in defaults and NPL. Thus, it is imperative to check the impacts of GDP growth on the NPL.

As mentioned, hiked unemployment rate is just another consequence of increased energy gap in Pakistan. For example, near to half a million workers have been unemployed in previous few years due to forced closure of manufacturing units or very slow business activity due to power shortages. Payne (2009) supported with his results that are discussed

in feedback hypothesis and it caused unemployment to increase. The similar findings found on energy supply in Illinois (USA). Thus, it is causing to increase the number of NPL. Therefore, this study will examine the influence of unemployment on the level of NPL.

Electricity crisis (energy gap) adversely affected investment in textile sector. Many Pakistani exporters budged their business from Pakistan to Bangladesh (due to number of benefits provided under Bangladesh Export Processing Zones while cheap labor is also available in Bangladesh[3]) for last five years. It is noted that almost 40% of textile industry moved to Bangladesh which affected a great number of families who were directly and indirectly linked with power looms business. It not only caused unemployment, it also decreased number of potential borrowers for the banking sector and hence it affected the bank credit to the private sector. It also gave rise to number of outstanding loans converted to NPL. Therefore, this study will investigate the influence of bank credit to private sector on the level of NPL.

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Lending interest rates added fuel to the fire by worsening the situation. As Pakistan is facing double-digit inflation which is an indication of social and economic instability in the country. Inflation and lending interest rates move in tandem in any economy. Though central bank reduces its policy rate from time to time and now it is on its record low (i.e. 5.75%) since 1960 to support the lending interest rate and to increase economic activity. The level of NPL are yet above the danger level (i.e. 10%). Lending interest rate is selected to include in this study because inflation has already been tested in a number of studies in

[3] For details refer to http://www.bangladeshcustoms.gov.bd/procedures/epzs/123

Pakistan. Thus, this study will determine the impact of lending interest rate on the NPL ratio.

It is also mentioned before that energy crisis is also a source of political instability. The shutdown of industries and consistent failure to overcome the problem of load-shedding (energy gap) forced the people for protests and public riots. This has increased frustration and people destroyed the public property that has led to poor law & order condition in the country. This poor law & order condition hampered the business activities and revenues and eventually translated into NPL. This discouraged the bank lending and affected the bank business in Pakistan. As energy crisis affected economic activity of Pakistan which increased inflation and unemployment jointly. This has led unrest and frustration among the masses which is resulting in confrontation against government has reached to enormous level. In such situation political figures become relevant in getting loans from banks for either their own businesses or their peers on rent-seeking (corruption). Also bank managers used their authorities to approve loans to low quality and ill-intended borrowers in exchange for favors to them (corruption). These loans ultimately were defaulted and helped increase in NPL. Thus, this study will examine the impact of both political stability and corruption on NPL.

Energy gap does not only affect NPL and external factors in isolation rather it affects the most important internal factors of banking sector like the financial health and leverage of the bank represented by capital adequacy ratio (CAR), the liquidity and financial intermediation represented by loan-to-deposit ratio (LTD) and bank's performance in the

form of its profitability reflected as return on assets ratio (ROA). Due to widened energy gap, there will be poor political stability, increased corruption, more inflation coupled with increased unemployment, abnormal high (low) lending interest rates resulting in lower economic activity and lesser opportunities for the banks to lend in the private sector. All these external factors will have a pronounced effect on the profitability of the banks and it will deteriorate the financial health of the banks translating into decreased financial intermediation and resulting in higher defaults on existing loans giving a rise to the level of NPL. Therefore, it suits for this study to investigate the impact of CAR, LTD and ROA on the levels of NPL in the conventional banks of Pakistan.

1.2.4 NPL, NPL's Internal Factors and Institutional Investors in Pakistan

A high NPL level can potentially deepen the severity and duration of a financial crisis and complicate macroeconomic management (Woo, 2000). It can also shatter investors' confidence in the banking system (Adhikary, 2006; Hussain, 2017) and prevent economic recovery by cutting profit margins and, therefore, the capital base is contracted for further lending due to liquidity problems (Bernanke & Lown, 1991; Hussain, 2017).

Bank capital is an important variable used by the bank to manage credit risk (due to NPL) level. BCBS introduced the Capital Adequacy Framework to promote soundness and stability in the financial system by controlling the banks from taking on excessively risky activities (Basel Committee on Banking Supervision, 1999). Capital adequacy ratio (CAR) has a significant influence on the amount of NPL for the bank. It is a measure of leverage. Since leverage is a measure of the use of debt loan in the capital structure of the bank, the higher the CAR, the lower the leverage of the bank. At one hand, it is argued that a low

capital ratio increases the NPL (Berger & DeYoung, 1997). While at the other hand, it is supported that banks with high capital adequacy ratios are involved in high risk activities, creating risky loan portfolios, and therefore high NPL rates. The high NPL cause liquidity issues and one important ratio that also describes liquidity is loan-to-deposit ratio.

Loans to deposits ratio (LTD) demonstrates the relationship between loans and deposits. LTD measures the funds that a bank has utilized into loans from the collected deposits and also represents the loan growth. According to Louzis, Vouldis, and Metaxas (2012) and Misra and Dhal (2010), the LTD affect the level of NPL. Increase in NPL cuts the profits of a bank which are normally represented by return on assets ratio (ROA) and/or by return on equity ratio (ROE).

ROA is considered as a better way of profitability measurement (Louhichi & Boujelbene, 2016). It is also used to show bank performance (Athanasoglou, Brissimis, & Delis, 2008; L. J. Cohen, Cornett, Marcus, & Tehranian, 2014). Highly profitable banks have fewer incentives to engage in high-risk activities and profitability is expected to negatively impact NPL, following the 'bad management' hypothesis of Berger and DeYoung (1997). In rebuttal, higher profits could also increase NPL. ROA also reveals the managerial efficiency of a bank to convert its assets into returns (profits). Good management should lead to lower NPL and thus better profitability.

The management of banks can play a significant role in controlling internal factors that have impact on the NPL (Berger & DeYoung, 1997). The quality of management is crucial

to a bank's survival (Barr *et al.*, 1994). While the quality of management depends on the ownership structure of the bank and there is a positive relationship between them (Hwang, 2012). Therefore, ownership structure of banks is important in managing its affairs especially NPL in banking business that can affect profitability and performance of the bank.

During the period of last two decades, an innovative trend towards the privatization in banking sector has altogether changed the ownership structure in Pakistani banks (Burki & Ahmad, 2010). Where the government has reduced its participation in banking ownership structure and the local companies, individuals and foreign origin banks from the private sector were allowed to make their entry in the banking system. At this point in time, institutional investors got influence in a considerable number of banks in Pakistan. Thus, the role of institutional investors in the determination of NPL has become relevant in moderating the internal factors of banking. The internal factors under consideration which are capital adequacy ratio (CAR), loan-to-deposit ratio (LTD) and return on assets (ROA) do not show consistent relationship with NPL that allow the insertion of a variable that can identify the reason of inconsistency on this relationship and that also justify the use of moderator (Namazi & Namazi, 2016).

The monitoring role of institutional investors in banks has been the focal point of researchers in extensive research work (Boussaada & Labaronne, 2015; M. Jensen, 1993; Pearce & Zahra, 1992; Shleifer & Vishny, 1986; Whidbee, 1997). Previous studies have focused on the monitoring role of institutional investors in the firms including banks mainly

concentrating on their politics. This study will look into the role of institutional investors and investigate it as a moderator on bank's internal factors that could have an effect on the level of NPL.

Therefore, once again the need to predict early warning signals of NPL are increasingly becoming important (Nabiyev, Musayev, & Yusifzada, 2016) and despite several studies on the determinants of NPL, the issue still needs to be explored with specificity to explain it fully as the problem is not only persistent but also on the rise with the passage of time (Ismail & Nayan, 2016). Moreover, the majority of these studies have been done in developed economies while there are very few studies in the developing and emerging economies. Also, the results of the studies in developed economies cannot apply in developing economies due to very little generalization power. The specific country dynamics even in developing countries studies might be missed. Therefore, the study of NPL in Pakistan which is also one of the developing economies will not only uncap the results for developing countries but rather it will bring up with results specifically for Pakistan.

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1.3 Problem Statement

The banking system is the important pillar of the financial system in developing countries (Raza *et al.*, 2013). The significant role of banks in Pakistan's economy is evident but the loans relative to deposits are showing a declining trend. Although NPL are showing a decreasing trend but these are still either higher than 10% or near to 10% threshold (Demirgüç-Kunt & Detragiache, 1998). Higher values of NPL ratio are burden on banks' balance sheets and on profits of a bank (Balgova *et al.*, 2016). While its high stock is also

a significant predictor of bank failure (Balgova *et al.*, 2016; Barr *et al.*, 1994; Gonzales-Hermosillo, 1999; Lu & Whidbee, 2013). Moreover, the exceeding of NPL from a specific level is also not good for the banking sector and it could continue to plague banking system (Mohsni & Otchere, 2014). Now if the actual data for Pakistan on gross NPL (Figure 1.1) and NPL ratios (Figure 1.2) are compared, it is clear that the same happened to the value of gross NPL after 2011-2012 where the NPL ratio is decreasing though it is still very high (about 10%). If NPL ratio exceeds 10%, it leads to an episode of distress and is classified as a full-fledged crisis (Demirgüç-Kunt & Detragiache, 1998). It also implies that NPL of Pakistani conventional banks showing an episode of distress in banking sector of Pakistan.

Balgova *et al.*, (2016) studied the countries whose banking NPL ratio are greater than 10% and Pakistan is ranked at 25th place amongst 32 countries. While in the region, its NPL ratio is not only consistently at the highest place among all countries, it is still above 10% in 2016 (Table 1.1). There are eight mergers in the banking sector during 2006-2017 (Competition Commission of Pakistan (CCP), 2017) due to high NPL (Appendix A) to avoid bankruptcy with the intervention of central bank. High NPL will lead to banking, financial and economic crises (Benazić & Radin, 2015; Lleshanaku, 2015). In fact, NPL are such a grave issue that the very survival of banks depends on it (Saba *et al.*, 2012). It points that the matter of NPL needs to be investigated with all prominent external factors (Energy Gap, GDP growth, unemployment, political stability index, lending interest rate, credit to private sector and corruption control index) and internal factors (capital adequacy, liquidity and profitability) prevailing in Pakistan.

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Moreover, if the internal factors are controlled via a strong internal mechanism, it can help banks to optimize their performance, financial intermediation and health in the given external environment. Institutional investors (in case of major shareholdings) are the most relevant and effective management mechanism of corporate governance (Srivardhan, 2009) as most of the banks in Pakistan after privatization are under the management of institutional investors (Ashfaq, Younas, & Mehmood, 2014). Additionally, the existing literature shows inconsistent results on the relationship between internal factors (CAR, LTD, ROA) and NPL. Thus, institutional investors are introduced as a moderator in this study to examine the exact relationship between these internal factors and NPL.

It concludes that this study will examine multiple external and internal factors that may cause the increase in NPL where energy crisis is the focal factor that might not only be responsible for high NPL in Pakistan rather it gives rise to other external factors (GDP growth, lending interest rate, unemployment, bank credit to private sector, political stability and corruption) and internal factors (CAR, LTD, ROA) which might also be responsible for the rise in NPL in Pakistan and also check the exact relationship between internal factors (CAR, LTD, ROA) and NPL with moderation of institutional investors.

1.4 Research Objectives

General objectives of this study are to examine the relationship between different external and internal factors and Credit Risk due to NPL and to examine moderating effects of institutional investors on the relationship of internal factors and Credit Risk due to NPL of conventional banks of Pakistan.

1. To identify which external factors namely GDP growth rate, lending interest rate, unemployment rate, bank credit to private sector, energy gap, political instability and corruption impact Credit Risk due to NPL.

2. To investigate which internal factors namely capital adequacy ratio, loan-to-deposit ratio and return on assets impact Credit Risk due to NPL.

3. To analyze the moderating effects of institutional investors (II) on the relationship between internal factors (CAR, LTD, and ROA) with NPL.

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1.5 Research Questions

In achieving the objectives mentioned, the study addresses the questions given as follows:

1. How much significant are the external factors (GDP growth rate, lending interest rate, unemployment rate and bank credit to private sector) effect on NPL especially energy gap, political instability and corruption?

2. What are the numeral measures of the strengths of the relationship between internal factors (CAR, LTD, and ROA) and NPL?

3. Do the institutional investors (II) as a moderator have a significant impact on the relationships between internal factors (CAR, LTD, and ROA) and NPL?

1.6 Scope and Limitation of the Study

This study is limited by its framework that assesses banks NPL exposure in Pakistani conventional banks only to determine the factors that have an impact on NPL. Islamic banks are omitted due to two reasons. Firstly, they are few in number and most Banks established in recent years and sufficient data is not available. Secondly, it is not the focus of the study because it is not a comparative study between conventional and Islamic banking as the focus is to find the factors influencing NPL in Pakistani conventional banks with the role of institutional investors on internal factors. This study further investigates how external and internal variables effect NPL during the period of 2006-2017 maintaining the dataset of all current conventional banks. This time frame captures the maximum dataset as after many mergers & acquisitions and the establishment of some new banks during 2005 whose data is available from 2006. So, the data availability constraint defined the period of the study from 2006 to 2017.

Moreover, this study is limited to the determinants of credit risk due to NPL which is the prevalent issue in Pakistani conventional banks. Therefore, the findings of the study should be looked as an evidence on how identified variables that seem to be the most relevant in Pakistani environment both from external and internal factors that might influence the NPL. Furthermore, this study does not cover all other variables that could have an influence

on NPL such as exchange rate and inflation but those are not captured in the model due to their relative importance in the context of Pakistan.

Also, this study is confined to secondary data sources only that mostly taken from banks' audited annual reports, World Bank, IMF and central bank of Pakistan (State Bank of Pakistan). In addition, the study's scope only covers the conventional banks as explained earlier, so, no other financial institutions are included.

1.7 Significance of the Study

The study assisted to fill the knowledge gap on the relationship of different factors with NPL in Pakistani banks. It used the most relevant internal and external factors in Pakistani environment to determine the level, relationship and their influence on NPL of banks. The results of this study helped to put light on new insights on banks behavior to these variables in terms of their NPL exposure considering important events that have taken place in Pakistani banking sector from 2006 to 2017.

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The "Institutional Investors" is taken as a moderator which is not found to be examined according to the literature review, it provides insight and understanding on how it could moderate the impact of internal factors on NPL of Pakistani banks. The results of this study could facilitate policymakers to assess the effectiveness of the existing NPL management tools and practices; the outcome of which would be useful in the developing and implementing appropriate policies and strategies in better NPL determination of Pakistani conventional banks. Furthermore, this study will contribute to the literature by providing

empirical evidence on a number of different kinds of variable testing along with moderation with a new variable of institutional investors on internal variables.

Moreover, the results of this study would provide new information that would be useful for policymakers, regulators and conventional bankers who may use this information to formulate policy at all levels in order to benefit all stakeholders of conventional banks in managing NPL.

Finally, this study would be beneficial to researchers and academicians by adding new empirical evidence on a unique new combination of variables which has energy gap as a new variable. BCPS, PSI and CCI are also not tested with NPL in Pakistan. These findings could help pave new research avenues. The findings of this study would provide new knowledge in the management of NPL and institutional investors on whether these create any positive difference which either scantily been studied in the available literature as to date it has not found and might not have been discussed in the available literature with similar set of variables taken in this study.

1.8 Organization of the Thesis

The thesis is subdivided into five parts as chapters. Chapter One explains firstly the background of the study, secondly the problem statement, thirdly the research questions, fourthly the research objectives, then, the research scope, the significance and the thesis outline. Chapter Two reviews the available literature from the related previous studies and the related theories that are related to this study. Chapter Three describes the econometric

modeling with a rationale of related studies in this study. It also explains the research design, research and conceptual framework, hypotheses development, sampling method, data collection, methods of data analysis and measurement of the variables. Chapter Four presents the selection of suitable method of analysis based on the nature of the data and diagnostics. It also provides the results with the discussion on the findings emanating from the outlined research questions and the outlined research objectives. Lastly, Chapter Five concludes the study and summarizes the finding, the limitation, the implications and the recommendations for probable future studies.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on reviews of the previous studies and literature related to the concept of NPL in the banking institutions, its theories and the factors which have an impact on it. Section 2.2 reviews literature on the aspect of NPL. Section 2.3 and section 2.4 respectively provides literature on related studies on external (macroeconomic) factors and internal (bank-specific) factors with empirical evidences and critical evaluations that affect NPL, section 2.5 highlights studies on the institutional investors' role in banking institutions. Section 2.6 describes the underlying theories relating to NPL and its influencing factors and also relating to institutional investors and banks. Section 2.7 concludes the chapter with its summary.

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2.2 Non-Performing Loans and its Ratio

The ratio of non-performing loans (calculated as total amount of NPL held by a bank to total gross loans) is a financial ratio which is indicator of financial stability and it is considered critically important because it represents credit risk and efficient allocation of resources to good projects. Several studies used this ratio to measure credit risk (Ahmad & Ahmad, 2004; N. H. Ahmad, 2003; Berger & DeYoung, 1997; Castro, 2013; Das & Ghosh, 2007; Haryono, Mohd, & Hamat, 2016; Kabir, Worthington, & Gupta, 2015; Misman, Bhatti, Lou, Samsudin, & Rahman, 2015; Tajik, Aliakbari, Ghalia, & Kaffash, 2015). State Bank of Pakistan (SBP), (2010) has provided the loan loss provision classification

guideline which is a part of disclosure requirement and follows the applied standards of financial reporting, when the amount of the principal or the interest due date has already passed more than ninety days or three months, bank shall classify a loan as nonperforming (NPL). NPL are the loans which are past due either ninety or more than ninety days (Farhan *et al.*, 2012; Hassan, Ilyas, & Rehman, 2014). Chen, Hasan, Lin, and Yen (2015) and Cheng, Lee, Pham, and Chen (2016) suggested that the portion of the banks' loan portfolios that are in default or near to default for nonpayment of more than 90 days. The Bank for international Settlements (2001) termed the chance of partial or total loss on outstanding loan as credit risk, due to credit events (default risk).

Meanwhile, Umar and Sun (2016) quoted the Bank for International Settlements (Basel Committee on Banking Supervision, 2006) as "a default is considered to have occurred with regard to a particular obligor when the obligor is past due more than 90 days on any material credit obligation to the banking group". Malimi (2017) and Petersson and Wadman (2004) considered loans either defaulted or in the danger of default as non-performing loans. NPL are also called delinquent loans by Chapman (1940) Vardar and Ozguler (2015) Warue (2013) and Keeton (1999), impaired loans by Ismail and Nayan (2016) and Kjosevski and Petkovski (2017), bad loans by Donath, Cerna, and Oprea (2014); Fofack (2005) and Swamy (2015), problem loans by Berger and DeYoung (1997) and Shaffer (2008), non-performing assets (NPA) by Durafe and Singh (2016); Ismail and Nayan (2016); Prasanna, Thenmozhi, and Rana, (2014); Sanjeev (2007); Selvarajan, Vadivalagan, and Srinivasan (2013); Swamy (2015) and Minton, Stulz and Williamson (2009), noncurrent loans by Bernanke and Lown (1991).

Hou and Dickinson (2007) highlighted that NPL caused efficiency problems to the banking sector in Japan and US. According to IMF (2004), NPL occurs when customers delay their repayment for ninety continuous days from their scheduled repayment due date. *Fraser et al.*, (2001) revealed that the credit risk (due to NPL) is the major reason for failures of banks, and it is the most prominent risk that banks' managers face. This risk occurs when customers could not pay their total loan in the given time frame which is called the loan default.

Thus, according to Kjosevski and Petkovski (2017) and Klein (2013), NPL loan is a concept used by regulators that is mainly about loans which are overdue by 90 days. According to the IMF's definition, NPL are a microeconomic event that happens between lender and borrower at the transactional level. However, studies have shown that NPL carries macroeconomic effects. Hu, Li, and Chiu (2007) demonstrated that NPL hinders macroeconomic growth and reduces economic efficiency because NPL exposes the system to financial vulnerability (Khemraj & Pasha, 2009; Louangrath, 2015) and sub-prime mortgage crisis has cast attention on NPL as a signal of an economic crisis (J. H. Park & Zhang, 2012). While Zribi and Boujelbène (2011) suggested that credit risk (due to NPL) in the banks of developing countries is greater than that in developed ones and that risk is influenced by internal control mechanism like managerial or institutional ownership in developing economies compared to their counterparts. Also, Karim, Chan and Hassan (2010) suggested that NPL reduced the banks' cost efficiency and poor management in the banking institution resulted in bad quality of loans. In other words, asset quality is result

of poor or bad management and it will increase the cost efficiency. Therefore, NPL, is a vital issue for bank managers, regulatory authorities, academic communities and investors (Vardar & Ozguler, 2015).

In this study, the determinants of NPL are categorized into external and internal factors. This is parallel with the studies done by Ashfaq, Younas and Mehmood (2014) and Mehmood, Irshad and Ahmed (2013).

2.3 External Factors

The existing literature contains empirical evidences that positive change in external (macroeconomic) factors like sustainable growth in economy, decline in unemployment and interest rates are linked with better loan quality. There are nine major macroeconomic variables that include GDP, inflation rate, trade balance, international reserves, fiscal balance, export growth rate, debt to GDP, financial depth (BCPS) and efficiency, and exchange rate and three political variables (political stability, government effectiveness and corruption levels) which are determinants of credit risk via credit ratings for a country (Teker, Pala, & Kent, 2013). The capacity of the borrowers to manage their loan repayment will increase with the improvements in external environment that eventually help in decreasing the number of defaults. Somehow, the results of the studies about these macroeconomic factors namely (annual GDP growth rate, annual lending interest rate, annual unemployment rate, bank credit to private sector as percentage of GDP, energy gap, political stability and corruption) from the literature yet need to be confirmed because

of inconclusive findings do not allow to confirm the relationship of these variables with the level of NPL.

2.3.1 Annual Growth Rate of Gross Domestic Product (GDP)

The Organization for Economic Co-operation and Development (OECD) defined gross domestic product (GDP) as "an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production." The researches further added that determinant of GDP is divided into three methods which are output or product method, income method and expenditure method. The popular way of estimating GDP is calculating its growth on annual basis (Jin, Yan, & Zhu, 2015). The whole economic activity is represented by it.

Louhichi and Boujelbene (2016) and Mileris (2013) reveals that the level of NPL move with changes in the economic conditions of a country. Moreover, GDP growth and unemployment are the main indices of macroeconomic activity and identified as primary determinants of NPL (Konstantakis, Michaelides, & Vouldis, 2016) while Dimitrios, Helen and Mike (2016) recognize GDP growth as one of the most significant factors influencing NPL and as a major driver of NPL through the last ten years.

2.3.1.1 Empirical Evidence on GDP

Fainstein and Novikov (2011) confirmed that changes in GDP growth are major cause for the increase in the levels of NPL. Louzis *et al.*, (2012) and Saba *et al.*, (2012) established that the level of NPL are strongly related with real GDP growth. Ahmad and Bashir (2013)

determined that GDP and inflation had significant relationship with NPL. Nkusu (2011) found that the external (microeconomic) environment taken as proxy by slower growth, declining asset prices or higher unemployment is interrelated with problems of debt servicing.

Given the relationship between GDP and NPL, some of the previous studies reported negative relationship between GDP and NPL's (Konstantakis et al., 2016; J. Lee & Rosenkranz, 2019; Louhichi & Boujelbene, 2016; Qwader, 2019) whereas others reported positive relationship between them (Beck, Jakubik, & Piloiu, 2015; Shingjergji, 2013). In addition, evidence of insignificant relationship is also found (Dimitrios *et al.*, 2016; Nor & Ahmad, 2015).

The existing literature over the association between GDP and NPL has been summarized in Table 2.1, for reviewing and analyzing to conclude on this relationship for this study.

Shingjergji (2013) and Inekwe (2013) determines a positive relation between GDP growth and NPL ratio. Beck *et al.*, (2015) findings supported the idea that loosen credit standards applied during the economic upturn result in the deterioration of the bank asset quality with a lag in response to positive growth.

On the contrary, Durafe and Singh (2016) inferred a negative relationships between GDP and NPL. The same results are conceded by Fofack (2005) in Sub-Saharan Africa, by Farhan *et al.*, (2012) in Pakistan and by Messai and Jouini (2013) in countries of Greece,

Spain and Italy. In addition, Bertay, Demirgüç-Kunt and Huizinga (2015) reveal that public banks report high NPL for the periods of economic booms. Likewise results are confirmed to maintain that the negative effect of GDP cycle or growth on NPL (Castro, 2013; Chaibi & Ftiti, 2015; Erdinç & Abazi, 2014; Espinoza & Prasad, 2010; Jakubík & Reininger, 2013; Kasselaki & Tagkalakis, 2014; Khemraj & Pasha, 2009; Louzis *et al.*, 2012; Makri *et al.*, 2014; Škarica, 2014; Zribi & Boujelbène, 2011).

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Table 2.1
Gross Domestic Product and NPL

S #	Author	Data	Country	Methodology	Results
1	Durafe and Singh (2016)	1999-2013	India	Panel Data Model	Negative
2	Konstantakis, Michaelides and Vouldis (2016)	2000-2008	Greece	VAR-VEC Model	Negative
3	Louhichi and Boujelbene (2016)	2005-2012	8 MENA countries and Bangladesh and Indonesia	GMM and Panel Vector Autoregressive (PVAR)	Negative
4	Angela and Irina (2015)	2000-2013	EU countries (EU28)	Simple Linear Regression Model	Negative
5	Baselga-Pascual, Trujillo-Ponce, and Cardone-Riportella (2015)	200-2012	14-euro area countries	GMM	Negative
6	Beck, Jakubik and Piloiu (2015)	2000-2010	75 developing & developed countries	Fixed Effect Model	Negative
7	Shingjergji (2013)	2005-2012	Albania	OLS-Regression	Positive
8	Inekwe (2013)	1995-2009	Nigeria	Pearson Product-Moment Correlation (Time Series)	Positive
9	Dimitrios, Helen and Mike (2016)	1999-2015	15 Euro area countries	GMM	Insignificant
10	Bougatef (2015)	2008-2010	16 Islamic countries	GMM	Insignificant
11	Nor and Ahmad (2015)	2005-2013	Pakistan	Hierarchical Multiple Regression	Insignificant
12	Vatansever and Hepsen (2015)	2007-2013	Turkey	OLS and Cointegration Regression	Insignificant

Source: Author's compilation from Literature

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2.3.1.2 Critical Evaluation and Literature Gap

The results on the relationship between GDP and NPL in the literature imply that improvement in the economic activity leads to lesser financial pressure on borrowers thereby lowering the NPL for banks while vice versa happens in case of decreased economic activity. In other words, the economic recession tends to make banks excessively pessimistic by lowering the lending and do more loan loss provisions and more worried about the increased level of NPL. When the overall macroeconomic conditions deteriorate the NPL ratio also deteriorates. The recession time, brings along with it, the personal financial distress and misery mainly caused by an increase in the unemployment. In retrospect, good economic conditions improve the confidence of the borrowers and lenders for repaying the debts which in turn reduces banks' NPL. Therefore, bank failure problems are less frequent when monetary conditions are stable with high growth rate in economies translating into lower NPL.

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Based on the previous studies, it can be summarized that at one hand that low GDP growth reduces economic activity and thus borrowers' loan paying capacity while at the other hand higher GDP growth cause to the increase in NPL. Thus, due to inconsistency between the relationship of GDP growth rate and NPL, GDP is taken in the conceptual framework of the study to determine the actual result for conventional banks in Pakistan.

2.3.2 Lending Interest Rate (LIR)

Lending Rate is the rate at which banks offer financing to the private sector (especially SME) to meet their financing needs both the short-term and the medium-term. This rate

usually varies with the borrowers' creditworthiness and also depends upon the loan's objectives (World Bank, 2018). While Regmi, Nikolsko-Rzhevskyy and Thornton (2015) defined it as the interest rate charged by banks to the private sector. The deregulation, characterized by abnormally high-interest rates, is the major reason behind most of the banking and financial crises (Fofack, 2005). The NPL increase significantly in response to higher interest rates (Castro, 2013).

2.3.2.1 Empirical Evidence on LIR

The interest rate is the most crucial condition that plays its role in the credit risk (due to NPL) due to its ability to affect the debt burden and also the probability of a borrower paying his debt (Castro, 2013). Crook and Banasik (2012) relate default rate to debt levels, interest rates and house prices in the US while Magri and Pico (2011) relate interest rate and default rates in the Italian financial institutions. Moreover, Fofack (2005) is of the view that interest rate liberalization increases the costs of funds and nurtures the culture of high-risk behavior. Thus, high-risk borrowers are usually charged with higher rates in an effort to lower the risk causing increased overall exposure of banks (Fofack, 2005). Therefore, when excessive lending rates are charged persistently over and over again, it results in the possible overall transformation of the fragile banking system into a financial crisis through increase in the loan payment defaulters and the moral hazard channel (Akinlo & Emmanuel, 2014) where moral hazard means bank managers take excessive risks by aggressive lending on behalf of the depositors while they are unaware of it and any consequences will befall on the depositors in the shape of reduced profits or losses when these loans converts to NPL.

Knowing the relationship between lending interest rate and NPL, some of the past studies reported negative relationship between lending rate and NPL (F. Ahmad & Bashir, 2013; Bucur & Dragomirescu, 2014; Fofack, 2005; Qwader, 2019) whereas others reported positive relationship between them (Beck *et al.*, 2015; Muntean, 2014; Touny & Shehab, 2015). In addition, evidence of insignificant relationship is also found (Climent-Serrano & Pavía, 2014; A. Ghosh, 2015; Vatansever & Hepsen, 2015).

Bucur and Dragomirescu (2014) report that negative association between NPL and interest rate. This implies that interest rate plays a significant negative role in decreasing the level of NPL. While Beck *et al.*, (2015) reported that the lending interest rates tends to cast a significantly positive impact on the NPL. Touny and Shehab (2015) argue that the household consumption is expanded in relation with the positive impact through loans particularly in petroleum countries. This can be attributed to the low level of the interest rate in these countries on consumption loans. Table 2.2 presents the literature review on this relationship.

While at the same time, many studies conclude insignificant association between interest rate and NPL (Asghar Ali & Daly, 2010; Climent-Serrano & Pavía, 2014; S. Ghosh, 2007; Vatansever & Hepsen, 2015).

2.3.2.2 Critical Evaluation and Literature Gap

Higher lending interest rate causes NPL to decline implies that deposits rates also increase in the banks and it motivates saving to reap the benefit on funds. So, investors are very

careful in investing and borrowing with high lending rates even for good projects. Thus, borrowing goes down and savings rises which promotes more savings and less borrowing in the economy. Only the individuals and investors dare to borrow who have guaranteed returns on their projects and investments and they expect no difficulty in repaying their debts, hence, it reduces the pileup in the levels of NPL. Moreover, the existing good borrowers strive to keep their credit rating up through regular payments on their loans so that they could continue to get financing at better rates. This will help good customers to enjoy funding at competitive and lower interest rates and they continue to pay their full debts within stipulated time that will help not to increase NPL in banks.

Alternatively, as the interest rate increases in the economy, it brings forward the borrowers who either do not have good projects or do not have intention to repay but these borrowers are ready to borrow at any interest rate. The banks following aggressive lending to meet the completion with high interest rates compromise in lending. These loans rarely paid back in full either due to the paying capacity on the basis of their projects' failures or due to their ill-intention to pay back. This will increase number of defaults and hence NPL. Lending at high interest rates to low quality borrowers due to number of factors at the cost of high pileup of NPL are called adverse selection.

Based on the mixed results of lending rate impact on NPL, no conclusion can be drawn. Therefore, lending interest rate is taken in the conceptual framework of the study to test lending interest rate impact on NPL for conventional banks in Pakistan.

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Table 2.2
Lending Interest Rate and NPL

Sr.#	Author	Data	Country / ies	Methodology	Results
1	Beck *et al.*, (2015)	2000-2010	75 developing and developed	Fixed Effect Model	Positive
2	Touny and Shehab (2015)	2000-2012	9 Arab Countries	Dynamic Panel Data (GMM)	Positive
3	Akinlo and Emmanuel (2014)	1981-2011	Nigeria	Cointegration and Error Correction Model	Positive
4	ERDİNÇ and ABAZİ (2014)	2000-2011	20 Emerging Europe countries	(Fixed & Random Effect) Model and GMM	Positive
5	Melecky (2014)	2002-2013	Czech Republic	(VEC) Model	Positive
6	Muntean (2014)	1960-2009	205 countries	Probit Model and OLS	Positive
7	Castro (2013)	1997-2011	Five European (GIPSI) countries	Dynamic Panel Data Technique (GMM)	Positive
8	Bucur and Dragomirescu (2014)	2008-2013	Romania	ANOVA and (univariate & Multivariate Regression)	Negative
9	Fofack (2005)	1993-2002	16 Sub-Saharan	Pseudo Panel Analysis	Negative
10	Ahmad and Bashir (2013)	1990-2011	Pakistan	OLS	Negative
11	Ghosh (2015)	1984-2013	US	GMM	Insignificant
12	Vatansever and Hepsen (2015)	2007-2013	Turkey	OLS and Cointegration Regression	Insignificant
13	Climent-Serrano and Pavía (2014)	2004-2011	Spain	Unbalanced Panel Data Regression	Insignificant

Source: Author's compilation from Literature

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2.3.3 Unemployment Rate (UR)

The unemployment rate is the number of unemployed persons relative to the labor force and it measures the proportion of the total labor force (Demirci, Huang, & Sialm, 2017). It is an important indicator of NPL on consumer loans (Louzis *et al.*, 2012) but it also has link to business and economic activities that affect demand of goods and services and eventually to business capacity to repay its loans (Quagliariello, 2007). Unemployment is identified as one of the primary determinants of NPL being one of the main indices of macroeconomic activity (Konstantakis *et al.*, 2016). Aver (2008) acknowledges that employment or unemployment rate is important in defining the loan portfolio of the Slovenian banking system.

2.3.3.1 Empirical Evidence on UR

The summary of literature on the impact of unemployment rate on non-performing loans is presented in Table 2.3 on page 39 for the review and possible extension of research.

Konstantakis *et al.*, (2016) states that unemployment affects cash inflows lowering income and increasing the probability of loan defaults. Similar results are reported by Touny and Shehab (2015) in some of the Arab countries, Vatansever and Hepsen (2015) in Turkey, Ghosh (2015) in India, Akinlo and Emmanuel (2014) in Nigeria, Castro (2013) in GIPSI countries, Louzis *et al.*, (2012) in Greece, Fainstein and Novikov (2011) in Baltic states, Nkusu (2011) in 26 advanced economies, Bofondi and Ropele (2011) in Italy, Aver (2008) in Slovenia, Quagliariello (2007) in France, Germany, Italy and UK, (Babouček & Jančar, 2005) in the Czech economy, and Salas and Saurina (2002) in Spain. According to Louzis

et al., (2012) unemployment significantly influence all kinds of NPL where NPL from businesses have pronounced impact due to its sensitive (J. Lee & Rosenkranz, 2019). Therefore, downsizing the labor cost leads to the start of debt servicing issues.

Alternatively, Zaib, Farid and Khan (2014) investigated both external and internal determinants in banks sector of Pakistan during 2003-2011 using fixed effect model and found that unemployment rate has inverse linear relation with NPL. Also Shu (2002) shows that unemployment rate has insignificant impact on NPL in Hong Kong banking system. He used quarterly data from 1995Q1-2002Q2 and estimated results through multiple linear regression model in Hong Kong. Qwader (2019) also supported the same result in his study in Jordan applying ARDL on data from 25 banks from 2011-2017 annual data. These studies appear to be the only studies reporting either negative or insignificant relationship between unemployment rate and NPL.

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2.3.3.2 Critical Evaluation and Literature Gap

In economic down turn, unemployment increases that results most likely in a decline in the levels of production due to shrinking of the effective demand which leads to cuts in the revenues of businesses.

The debt conditions got fragile and the business capacity to meet their debt payments are hampered. Thus, it could damage household purchasing power both in short and long run due to increased debt burden as their cash flow streams are affected badly.

Table 2.3
Unemployment Rate and NPL

Sr.	Author	Data	Country	Methodology	Results
1	Konstantakis *et al.*, (2016)	2000–2008	Greece	VAR-VEC Model	Positive
2	Touny and Shehab (2015)	2000-2012	9 Arab Countries (4 Petroleum and 5 non-petroleum)	Dynamic Panel Data (GMM)	Positive
3	Ghosh (2015)	1984-2013	US	GMM	Positive
4	Vatansever and Hepsen (2015)	2007-2013	Turkey	OLS and Cointegration Regression	Positive
5	Akinlo and Emmanuel (2014)	1981-2011	Nigeria	Cointegration and VEC Model	Positive
6	Castro (2013)	1997-2011	GIPSI countries	Dynamic Panel Data (GMM)	Positive
7	Louzis, Vouldis and Metaxas (2012)	2003-2009	Greece	Dynamic Panel Data Method (GMM)	Positive
8	Fainstein and Novikov (2011)	2002-2009	3 countries (Baltic states)	Vector Error Correction (VEC) Model	Positive
9	Nkusu (2011)	1998-2009	26 advanced countries	OLS, PCSE and One-step GMM	Positive
10	Aver (2008)	1996-2002	Slovenia	Multiple Linear Regression Model	Positive
10	Zaib, Farid and Khan (2014)	2003-2011	Pakistan	Fixed Effect Model	Negative
11	Shu (2002)	1995-2002	Hong Kong	Multiple Linear Regression Model	Insignificant

Source: Author's compilation from Literature

On the contrary, during times of economic upturn, unemployment rates decline and borrowers are in a position to manage their debt that consequently transforms in fewer NPL. Therefore, unemployment rate being part of overall external environment correlates with debt service problems and translates into a portion of problem loans.

While insignificant results on the relationship between unemployment rate and NPL imply that bank loan portfolios carry relatively negligible potion of personal and consumer loans or these loans are well collateralized or securitized such that in case of loan default it has very little influence on the level of NPL.

Based on the previous studies, it can be seen that there exists an inconsistency between the relationship of unemployment rate and NPL. This macroeconomic factor is taken into conceptual framework of the study to test its influence on NPL in banking sector of Pakistan.

Universiti Utara Malaysia

2.3.4 Bank Credit to Private Sector (BCPS)

Bank credit to private sector refers to meeting the financing and credit needs of private sector by banking institutions (all banks except central banks) and these could be loans, credit on trades and non-equity securities and include other accounts receivable, that establish a claim for repayment. These claims could be credit to public enterprises for some countries (including Pakistan, whose data is compiled by world bank) also (World Bank, 2017). Bank credit to private sector is thought to be a good measure of financial development because comparative to public sector, the private sector utilizes funds more

efficiently and productively to have a positive impact on the economy (Ang, 2009). While Ziaei (2016) considers it a proxy of lending channel. Generally, bank credit to private sector is driven by micro and macroeconomic factors. While the microeconomic factors are bank and individual-specific where credit is advanced based on individual traits, the macroeconomic factors influencing bank credit relate to macroeconomic fundamentals underlying the overall economy (Baoko, Acheampong, & Ibrahim, 2017) such as GDP, lending interest rate, unemployment rate, energy gap, political stability and corruption.

2.3.4.1 Empirical Evidence on BCPS

Many of the previous studies has reported positive relationship between bank credit to private sector and credit risk (Akinlo & Emmanuel, 2014; Angela & Irina, 2015b; Erdinç & Abazi, 2014; Jakubík & Reininger, 2014; Konstantakis *et al.*, 2016). It implies that increase in bank credit to private sector may increase the levels of NPL. For instance, Akinlo and Emmanuel (2014) reported that credit to private sector positively influence the credit risk in Nigeria. Similar results were reported in case of European countries from 28 European Union countries (Angela & Irina, 2015b), twenty emerging countries of Europe (Erdinç & Abazi, 2014), 9 countries from central and south eastern Europe (Jakubík & Reininger, 2014) and from Greece (Konstantakis *et al.*, 2016). According to all these studies credit risk is positively related to the bank credit to private sector in most of the European countries.

Konstantakis *et al.*, (2016) confirmed that during the time of economic boom, increased lending would be carried out on compromised credit standards that results in a sharp rise

in NPL. Angela & Irina (2015b) argued that in times of economic recession, a significant and rapid increase in the levels of the bank credit to private sector shows excessive risk-taking behavior that could cause significant and alarming increase of NPL rate. The process of sustainable financial deepening is suggested when the pace of loan growth exceeds the growth of GDP in an economy but there is chance of excessive increase in NPL (Jakubík and Reininger, 2014). While Akinlo and Emmanuel (2014) pointed out that the increased lending by conventional banks influence NPL positively whereas at the meantime the increase in BCPS influence NPL negatively. However, if the money supply increases it leads to loan growth which possibly increases the number of NPL. Thus, it supports the positive relationship as well between BCPS and NPL. Conversely when BCPS is considered as financial depth measure, a negative impact on NPL are expected but in banking system of emerging Europe Erdinç and Abazi (2014) found that unsustainable loan growth leads to financial fragility. Thus, the nature of relationship between BCPS and NPL also depends on lending activity.

Universiti Utara Malaysia

On the contrary as discussed, many of the other studies reported inverse relationship between BCPS and NPL (Amin, Chernykh, & Imam, 2014; Das & Ghosh, 2007; Fofack, 2005; Klein, 2013; Nkusu, 2011). It implies that increase in BCPS may decrease the level of NPL. For example, Nkusu (2011) conducted his study in 26 advanced countries and reported that BCPS has negative influence on levels of NPL. While other studies have similar results despite they were conducted in low income country like in Bangladesh by Amin *et al.*, (2014) and in emerging economy like in India by Das and Ghosh (2007a) and

in 16 sub Saharan African countries by Fofack (2005) and also in European countries by Klein (2013).

2.3.4.2 Critical Evaluation and Literature Gap

According to Nkusu (2011) increased burden of debt on debtors adds to the level of vulnerability through adverse shocks that influence either their wealth or income, thereby increasing the chance that they would be trapped into debt servicing while at the times of economic upturn, BCPS as proxy of indebtedness is expected to impact contemporaneous NPL negatively. Amin *et al.*, (2014) concluded based on the results on their study that strong and consistent role of factors (relating to macro-level developments) helps to decrease level of NPL and causes increase in economic growth and financial development (proxy of BCPS). Klein (2013)reported it other way around that higher level of NPL hinders for longer duration of time BCPS with adverse effects on economic growth. Das and Ghosh (2007a) presented a remedy in their study that lending to non-priority sectors helps reduce the number of NPL provided the banks have good credit risk management practices otherwise the reverse will be true. Fofack (2005) inferred that BCPS increases after the crisis periods. While aggressive lending before crisis period is usually followed by a sharp decline in BCPS immediately after the breakout of crisis.

Based on these studies, it can be seen that there exists an inconsistency between the relationship of BCPS and NPL. Table 2.4 shows the findings of some the most important studies on this relationship.

Table 2.4
Bank Credit to Private Sector and NPL

Sr#	Author	Data	Country/ies	Methodology	Results
1	Konstantakis *et al.*, (2016)	2000–2008	Greece	VAR-VEC Model	Positive
2	Angela and Irina (2015)	2000-2013	EU countries (EU28)	Simple Linear Regression Model	Positive
3	Jakubík and Reininger (2014)	2004-2012	9 CESEE countries	GMM	Positive
4	Akinlo and Emmanuel (2014)	1981-2011	Nigeria	Cointegration and Error Correction Model	Positive
5	ERDİNÇ and ABAZİ (2014)	2000-2011	20 Emerging Europe countries	Poled OLS (Fixed & Random Effect) Model and GMM	Positive
6	Amin, Chernykh and Imam (2014)	2000-2010	Bangladesh	Fixed Effect Model	Negative
7	Klein (2013)	1998-2011	16 CESEE countries	Fixed Effect Model and GMM	Negative
8	Nkusu (2011)	1998-2009	26 advanced countries	OLS, PCSE and One-step GMM	Negative
9	Das and Ghosh (2007)	1994-2005	India	GMM	Negative
10	Fofack (2005)	1993-2002	16 Sub-Saharan African Countries [CFA (7) and Non CFA countries (9)]	Granger-Causality and Pseudo Panel Analysis	Negative
11	Shaffer (2008)	2000-2005	82 developing and developed Countries	Linear Mixed-Effects Model	Insignificant

Source: Author's compilation from Literature

Universiti Utara Malaysia

2.3.5 Energy Gap (EG)

Energy is one of the most integral part for the economic development because all sectors in an economy require consistent and affordable supply of energy to move the wheels of the economy (C.-C. Lee, 2005; Sahir & Qureshi, 2007). The literature on the relationship of energy gap (crisis) and economic development represents a positive relationship (C.-C. Lee, 2005; Wolde-Rufael, 2005).

2.3.5.1 Empirical Evidence on EG

Keeton and Morris (1987) seminal study on the factors influencing NPL, discovered that bad performance of agricultural and energy sectors with weak economic environmental factors is leading factor for the increase in NPL. This study took the data from 1979-1985 from USA. This implies that energy crisis (gap) is an important reason for the rise in the level of NPL.

Universiti Utara Malaysia

2.3.5.2 Critical Evaluation and Literature Gap

Sahir and Qureshi (2007) and Lee (2005) argue that energy gap affect the economy of a country by affecting production levels and cost of production that effectively alter the demand and also level of employment. These all create an inverse synergy on the business profits which in turn drastically decreasing the individual income and cash flow making it hard for both businesses and individuals to service their debts. This results in the rise of level of NPL. Thus, constant flow of energy is vital in containing NPL. While energy gap has not been found to be studied in the review of the literature with NPL. Therefore, this

literature gap is addressed in the study by including energy gap as one of the factors in determining NPL of conventional bank.

2.3.6 Political Stability (PSI)

Political stability index (PSI) is a sensitivity of likelihood that the government is destabilized or overthrown by undemocratic or violent means inclusive of politically-motivated aggression and by the act of terrorism (International Monetary Fund, 2011). It is measured by percentile rank among all countries over the world. Boudriga *et al.*, (2008) analyzed the bank specific determinant of problem loans in the MENA countries. They collected data from 46 banks from 12 countries and found out that political stability index and NPL in MENA countries has inverse but insignificant association.

The risk taking is related with political stability and institutional environment (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997). The risk taking behavior of private banks depends on the development of a country and political risk therein (Mohsni & Otchere, 2014). However, among other factors political environment also has significant impact on NPL (Bhattarai, 2014). Hu *et al.*, (2007) concede that political lobbying getting importance in sanctioning a loan from a public bank. Political lobbying with private corruption, in Taiwan, increase the NPL ratio (Hu *et al.*, 2007). Shaffer (2008) also suggests that government stability as one of the important conditioning factors on the effects of corruption with respect to problem loans.

2.3.6.1 Empirical Evidence on Political Stability

Park (2012) considers that various qualitative aspects in a country including political stability as a significant determinant of soundness of the banking system. Mo (2001) took political stability as one of the three channels for the corruption-growth process. Boudriga *et al.*, (2008) consider political stability as one of the integral element of the institutional environment with the legal and judicial framework, and the degree of corruption control. Mohsni and Otchere (2014) conclude that banks in politically stable countries are less aggressive in risk taking and have low political risk. Here, low political risk means that there are lower chances of approving loans on the basis of political influence both from politicians and the bank management. Bhattarai (2014) study summarizes that instable political environment increases the banks' NPL based on perception of bankers. While Hu *et al.*, (2007) and Boudriga *et al.*, (2008) argue that the banks owned by state are more open to both administrative pressure and political lobbying that result in accumulation of more NPL. Shaffer (2008) concludes that political instability increases bad loans by heightening the effects of corruption. Louhichi and Boujelbene (2016) used an aggregate governance index based on a total of six indicators of governance developed originally by Kaufmann, Kraay and Mastruzzi (2009) to check the influence of the institutional environment on the credit quality of banks. The index includes political stability and violence with other five dimensions of governance. Boudriga, Taktak and Jellouli (2010) argue that good governance of well-functioning institutions results in lower risk in the financial system. Similarly, Kabir *et al.*, (2015) support that good governance reduces banking NPL. The table 2.6 shows the findings of some the most important studies on the relationship of PSI and NPL.

Table 2.5
Political Stability and NPL

S#	Author	Data	Country	Methodology	Results
1	Louhichi and Boujelbene (2016)	2005-2012	8 MENA countries; Bangladesh & Indonesia	GMM and Panel Vector Autoregressive (PVAR)	Positive[1]
2	Mohsni and Otchere (2014)	1988-2007	42 countries	Multivariate Regression Analysis	Positive[2]
3	Bhattarai (2014)	2013 (Primary)	Nepal	Multiple Regression Model	Positive[3]
4	HU *et al.*, (2007)	1996-1999	Taiwan	OLS (Random Effect Model)	Positive[4]
5	Nor and Ahmad (2015)	2005-2013	Malaysia	Hierarchical Multiple Regression	Insignificant[5]
6	Breuer (2006)	1997-1999	57 countries	OLS and Random Effect Model	Insignificant[6]
7	Park (2012)	2002-2004	76 countries	Spline Linear Regression and Nonlinear Least Square	Insignificant
8	Boudriga *et al.*, (2008)	2002-2006	12 MENA countries	Random Effect Regression Model	Insignificant
9	Shaffer (2008)	2000-2005	82 Countries	Linear Mixed-Effects Model	Insignificant

Source: Author's compilation from Literature

[1] An improved institutional environment coupled with privileged governance power depicts a positive statistically significant correlation with credit risk.

[2] Positive relationship between Political risk and Bank Risk Taking.

[3] Positive relationship between Instable Political Environment and NPL.

[4] Positive relationship between Political lobbying and NPL.

[5] Insignificant relationship between Political Stability Index and NPL.

[6] Insignificant relationship between Government Stability and NPL.

Universiti Utara Malaysia

2.3.6.2 Critical Evaluation and Literature Gap on Political Stability and NPL

The role of all the political parties could help improve the situation during strikes and shut downs in businesses that might help maintain a better business environment and surely help reduce NPL. Political pressures in a political system derive bank's lending activities to favorite segments of political groups which normally are the riskier sectors of the economy. They also demand loans at preferential rates and also expect write offs on these loans in case of minor difficulties and this put banks in general and public sector banks in particular in tight liquidity position that might force banks to defaults.

Nor and Ahmad (2015) report that political stability index has no significant relation in influencing NPL of Banks in Malaysia. Similar results are also reported by Breuer (2006) in his study in 57 countries, Park (2012) in his study of 76 countries, Boudriga *et al.*, (2008) study in 12 MENA countries, and Shaffer (2008) study of 82 countries around the globe. The low levels of per capita income in developing economies which are mostly politically instable are considered as the weak financial systems (La Porta, Lopez-De-Silanes, & Shleifer, 2002), with high levels of corruption (Khwaja & Mian, 2011). This shows a link that politically instable countries have higher level of corruption and this synergy further aggravates the NPL of banking system.

Based on the previous studies, it can be seen that there exists an inconsistency between the relationship of political stability and NPL.

Universiti Utara Malaysia

2.3.7 Corruption (CCI)

Corruption control index (CCI) is an observation of the extent to which public power is exercised for private gain inclusive of both minor and splendid forms of corruption as well as exploitation of political influence for personal benefit. It is measured by percentile rank among all countries in the world. An unfair behavior of an official pursuing unlawful private personal gain can be termed as corruption. The unethical activities like bribes (both taking and offering) in the shape of gifts, double dealing, unreported hidden dealings and diverting funds for laundering money and other gains included in corruption (Bougatef, 2015; Goel & Hasan, 2011; Park, 2012) and extortion, cronyism, nepotism, patronage, graft, and embezzlement (Park, 2012). Shaffer (2008) declares it a clandestine activity and Breuer (2006) reveals that conflicts of interest are there when the concerned individuals go against their agreements with the office in any way implicitly or explicitly. In other words, when a person follows self-serving interest via corruption, he or she fails to align with interest of the organization. So, it can be said that conflict of interest might take individuals towards corruption.

It is a big hurdle in economic growth and development (Park, 2012; Wilhelm, 2002) and it aggravates the problem with NPL when funds are channeling to bad projects and not to the good ones (Bougatef, 2015; Park, 2012) which typically ends up with an increase of NPL (Park, 2012). So, corruption is a serious barrier to effective mobilization and allocation of resources (Bougatef, 2015). Corruption damages bank soundness, which makes the banking system more fragile, and hence a country could fall a prey to a financial crisis. An evidence is of Hanbo corporation in South Korea during the East-Asian financial crises of

1997–1998. Where the connections of politicians and firms have led to the high levels of banks' NPL and finally to the financial crisis (Park, 2012) in Korea. Corruption is one of the essential factor to determine the NPL ratio (Hu *et al.*, 2007) while Park (2012) acknowledges the corruption as a global determinant of the loan quality in the banking sector.

Corruption is common in many countries (Hu *et al.*, 2007). Trnsparency International (2003) reported in its investigation report on global corruption that corruption is a common phenomenon around the globe, particularly in developing countries its ratio is too high and comparatively is higher than in developed countries. Corruption has great role in the NPL' growth in developing countries (Ahmad, 2013b; Breuer, 2006). It is also notable that privately owned banks are involved in corruption particularly in those countries where civil discipline and democratic traditions are weak (Finkel, Sabatini, & Bevis, 2000; Johnson & Wilson, 2000). The decision makers of these societies always remain under the pressure of those groups who want favors for illegal economic and unjustified rents. Boudriga, Taktak and Jellouli (2009) refer to Barth, Caprio and Levine (2006) who highlighted that granting more power to official supervision and regulation will corrupt lending of banks by giving it a rise.

2.3.7.1 Empirical Evidence on Corruption

Many existing studies supports "sand the wheel" effect of corruption which means greater corruption increases bad loans (F. Ahmad, 2013a; M. Ali, Sohail, Khan, & Puah, 2019; Batra, Kaufmann, & Stone, 2003; Boudriga, Taktak, et al., 2009; Goel & Hasan, 2011;

Lízal & Kocenda, 2001; J. Park, 2012; Shaffer, 2008). Chen, Jeon, Wang and Wu (2015) suggest that banks' soundness decreases with the increase in the intensity of corruption and the influence of corruption on banks' risk-taking cannot be ignored. Boudriga *et al.*, (2008) find the similar results in MENA countries. Weill (2011) concludes that banks become careful and conscious when level of corruption is high.

On the other hand Chen *et al.*, (2015) support the view of "grease the wheel" in their study in 35 emerging economies from Europe, Latin America, and Asia. It means that corruption decreases credit risk or it helps decrease NPL. Similar results are reported by Boudriga *et al.*, (2008) in 12 MENA countries and by Weill (2011) in Russia. Park (2012) argues that corruption sometimes influence other way around by not leading to NPL which explains "grease the wheel" proverb. For instance, if a borrower has a profitable project and in dire need of quick financing for success of his project, he may bribe the official to save the time and get a quick loan approval that increase the chances of success of his project. Similar argument as "speed money" argument is presented by Mauro (1995) in his study in 70 countries around the globe. Weill (2011) also supports this view and explains that the probability of getting loan approval increases when loan officer favors on getting bribe. Corruption motivates lending (Levin & Satarov, 2000). Thus, corruption 'greases the wheels' of the banking industry and as per the Russians proverb, ''one hand washes the other." This proverb explains that you need one hand to clean other hand and vice versa. This implies that corruption helps in getting loans approved quickly for good projects and profits from these projects helps repay those loans.

Universiti Utara Malaysia

Chen *et al.*, (2015) conclude statistically insignificant relation between corruption and NPL. Similar conclusion is presented by Nor and Ahmad (2015) and by Ahmad (2013b) in Pakistan. Ahmad (2013b) used Corruption perception index (CPI) in his study for corruption and he justifies by arguing that CPI is not based on the bank data and this could be the reason of insignificant result on the relation between CPI and NPL.

2.3.7.2 Critical Evaluation and Literature Gap on Corruption and NPL

Corruption promotes bribes, oversight of credit standards, and weak management in the banks. It could be result of information asymmetry between lenders and bank, weak regulation and legal system. The political influence could also induce corruption. All these factors could influence the level of NPL. Widespread corruption encourages the number of loans defaults and hence NPL. Banks are alternative sources of rents (corruption) for government officials seeking self-enrichment or political support through "crony capitalism." Corruptly obtained loans, furthermore, tend to finance lower-quality borrowers with a reduce ability, and incentive, to repay loans, ultimately leading to non-performance and financial loss. The banks and borrowers are more self-centric in countries with common corrupt practices. This will give rise to conflicts of interest which result in the form of more NPL.

Shaffer (2008) suggests that corruption is generally more destructive in the presence of political instability. Based on the previous studies, it can be seen that there exists an inconsistency between the relationship of corruption and credit risk. The table on it shows the findings of some the most important studies on this relationship.

Table 2.6
Corruption and NPL

Sr#	Author	Data	Country / ies	Methodology	Results
1	Bougatef (2015)	2008-2010	16 Islamic countries	Dynamic Panel approach (GMM)	Positive
2	Park (2012)	2002-2004	76 countries	Spline Linear Regression and Nonlinear LS	Positive
3	Goel and Hasan (2011)	2007 (Primary)	60 countries	OLS	Positive
4	Boudriga, Boulila and Jellouli (2009)	2002-2006	59 countries	Panel Data Regression	Positive
5	Shaffer (2008)	2000-2005	82 Countries	Linear Mixed-Effects Model	Positive
6	Hu *et al.*, (2007)	1996-1999	Taiwan	OLS (Random Effect Model)	Positive
7	Breuer (2006)	1997-1999	57 countries	OLS and Random Effect Model	Positive
8	Chen, Jeon, Wang and Wu (2015)	2000-2012	35 European Emerging Economies, Latin America and Asia	Benchmark Regression Model, Alternate analysis techniques (2SLS, Fixed Effect, Random Effect, GLS, GMM)	Negative
9	Boudriga, Taktak and Jellouli (2008)	2002-2006	12 MENA countries	Random Effect Regression Model	Negative
10	Weill (2011)	2002 (4 Quarters)	Russia	OLS	Negative
11	Nor and Ahmad (2015)	2005-2013	Malaysia	Hierarchical Multiple Regression	Insignificant
12	Ahmad (2013)	2001-2010	Pakistan	OLS	Insignificant

Source: Author's compilation from Literature

2.4 Internal Factors

The available literature substantiates that the bank-specific factors contributes significantly NPL via influencing un-systematic risk (Waqas et al., 2017). A thorough understanding of these factors are still lacking in the literature (Manz, 2019). Capital adequacy ratio, loan-to-deposit ratio and return on assets ratio are particularly included in the study and the discussion on the contribution of these variables towards nonperforming loans in literature is reviewed in the subsequent subsection.

2.4.1 Capital Adequacy Ratio (CAR)

Equity ratio over total asset value (ER) and CAR are alike measures (Zhang, Cai, Dickinson, & Kutan, 2016). CAR is an estimate of banks' financial situation and strengths (Erdinç & Abazi, 2014). While Meela and Prasad (2016) declare it as a measure of leverage and since leverage is a measure of the use of debt loan in the capital structure of the bank, the higher the CAR, the lower the leverage of the bank. Misman, Bhatti, Lou, Samsudin and Rahman (2015) discuss Demirguc-Kunt (1989) who accomplishes that assets quality, management competence, earnings along with capital adequacy is the significant explanatory variables among other, for default of the bank. Hence more stringent capital regulation is found to increase banks' financial stability (Chen *et al.*, 2015).

Therefore, Basel Committee on Banking Supervision (BCBS) presented the Capital Adequacy Framework to encourage healthy and stable financial system through the control of the banks from excessive risk taking actions (Basel Committee on Banking Supervision, 1999). CAR is among the financial soundness indicators (FSI) of banks suggested by the

IMF (Park, 2012). Zhang, Cai, Dickinson and Kutan (2016) concede that the CAR required by the Basel Accord is having a significant role in sustaining the Chinese bank's stability.

Boudriga *et al.* (2009) explain theoretically that the CAR act as a control mechanism against excessive by the bank's risk taking and to avoid them from being default by recapitalization (Basel accord). Banks with inadequate CAR are required to adjust their statement of financial position to meet with the regulatory obligation either by issuing more capital (holding assets constant) or decreasing risk-weighted assets (holding capital constant). Actually, increasing the level of capital in comparison with the risky assets by either way may result in a healthy performance of the bank and soundness (Fries & Taci, 2001).

So, Makri *et al.*, (2014) assume that CAR is used as a measurement to calculate the risk that a bank can undertake and it also determines the risk behavior of banks. Meela and Prasad (2016) and Makri *et al.*, (2014) observe CAR to have a significant influence on the level of NPL for the bank. So, it is important and is also used by the banks to manage level of NPL (Misman *et al.*, 2015). Basel Accord requirement of 8% CAR can also signal a potential moral hazard problem (Zhang *et al.*, 2016).

Thus, if the bank capital is facing a downward trend because of the moral hazard incentives of managers of the bank, banks will suffer higher NPL since their position will be riskier (Espinoza & Prasad, 2010). Erdinç and Abazi (2014) quote Salas and Saurina (2002) who confirm that CAR with some external and internal variables affects credit risk and explain

variations in NPL. CAR is also used as a factor of credit risk based on the logic that the higher the capital of the banks the results in the lower level of NPL (Swamy, 2012).

Although CAR is the foremost regulatory measure in numerous countries but academia is still debating whether capital adequacy guideline can save banks from high risk taking (Furlong & Keeley, 1989; Hellmann, Murdock, & Stiglitz, 2000; Kim & Santomero, 1988; Koehn & Santomero, 1980), a harmony appears to prevail between policymakers. The current struggle of the Basel Committee to introduce a new capital accord named Basel II may confirm that this regulatory initiative may be supportive towards reduction in risk-taking incentives of banks (Park, 2012).

Both theoretically and empirically, no harmony exists on the association among capital adequacy and NPL and it is ambiguous (Boudriga, Boulila, *et al.*, 2009; Boudriga, Taktak, *et al.*, 2009; Fiordelisi, Marques-Ibanez, & Molyneux, 2011; Makri *et al.*, 2014; Rime, 2001; Sinkey & Greenawalt, 1991).

Some studies show that a higher level of CAR reflects the bank is comparatively on the safe side and may result in low level of NPL (Berger & DeYoung, 1997; Salas & Saurina, 2002) which means that there is significant negative association between CAR and NPL (Boudriga, Boulila, *et al.*, 2009; M. Chen *et al.*, 2015; Erdinç & Abazi, 2014; Espinoza & Prasad, 2010; Jameel, 2014; Makri *et al.*, 2014; Meela & Prasad, 2016; Sinkey & Greenawalt, 1991; Zhang *et al.*, 2016). The same result is reported by Misman *et al.*, (2015) for Banks. Berger and DeYoung (1997) consider it as Moral Hazard Hypothesis.

Boudriga, Boulila, *et al.*, (2009) suggest that the CAR may be utilized as a regulatory tool to lessen the excessive risk taking by the banks while Meela and Prasad (2016) refer Ghosh (2005) who finds out that increase in bank leverage was associated with an increase of NPL. The negative relationship between CAR and NPL implies that owners of the banks must own more of their capital at risk as the assets of the bank become riskier.

It will encourage the banks to follow more prudent risk-taking (M. Chen *et al.*, 2015). Swamy (2012) argues that increased capital base of the banks results in increased confidence of the bank and also shown in the performance by the banks therefore it leads towards effective bank loan's recovery and reducing the level of NPL (Barth, Caprio, & Levine, 2004). Moreover, regulatory and supervisory bodies stress the significant role of capital stringency as a barrier against loss and later defaults (Dewatripont & Tirole, 1994).

On the other hand, other studies indicate CAR positively affect NPL (Vatansever & Hepsen, 2015) or bank risk-taking (Besanko & Kanatas, 1996; Blum, 1999; Godlewski, 2005). Zhang *et al.*, (2016) confirm that banks with significant issues either in terms of NPL ratio or CAR tend to do aggressive lending, as a result, more loss in the following period while stringent restraints on capital suggest added burden on return of the assets, that may be achieved by the higher risk taking (Godlewski, 2005) creating risky loan portfolios, and therefore high NPL (Boudriga, Boulila, *et al.*, 2009; Makri *et al.*, 2014) as they think that they are having sufficient capital to safeguard any potential loss (Boudriga, Boulila, *et al.*, 2009; Rime, 2001). Misman *et al.*, (2015) corroborate this argument for Banks.

Table 2.7
CAR and NPL

S#	Author	Data	Country/(ies)	Methodology	Results
1	Zhang, Cai, Dickinson and Kutan (2016)	2006-2012	China	Threshold Regression Model	Negative
2	Meela and Prasad (2016)	2008-2014	India	Linear Regression Model	Negative
3	Misman, Bhatti, Lou, Samsudin and Rahman (2015)	2000-2013	Pakistan	Fixed Effect Model	Negative
4	Chen *et al.* (2015)	2000-2012	35 Emerging Economies of Europe Latin America and Asia	Benchmark Regression Model, Alternately (2SLS, Fixed Effect, Random Effect, GLS, GMM)	Negative
5	Makri, Tsagkanos and Bellas (2014)	2000–2008	14 countries of Eurozone	Dynamic Panel Regression (GMM)	Negative
6	Jameel (2014)	2000-2010	Pakistan	Multiple Regression Model	Negative
7	ERDİNÇ and BAZİ (2014)	2000-2011	20 Emerging Europe countries	Poled OLS (Fixed & Random Effect) Model and GMM	Negative
8	Boudriga *et al.* (2009)	2002-2006	59 countries	Panel Data Regression	Negative
9	Vatansever and Hepsen (2015)	2007-2013	Turkey	OLS and Cointegration Regression	Positive
10	Swamy (2012)	1997-2009	India	Panel Data Analysis	Insignificant
11	Park (2012)	2002-2004	76 countries	Spline Linear Regression and Nonlinear L Square	Insignificant

Source: Author's compilation from Literature

Universiti Utara Malaysia

Park (2012) shows in his study on a sample of 76 countries that CAR has not influenced on NPL that can be seen as a statistically significant impact. Same results are concluded by Swamy (2012) and Bawa, Goyal, Mitra and Basu (2019) in India and by Pasiouras (2008) in Greece. Based on the previous studies, it can be seen that there exists an inconsistency between the relationship of CAR and NPL. The table on it above shows the findings of some the most important studies on this relationship.

2.4.2 Liquidity [Loan-to Deposit Ratio (LTD)]

It is also considered as liquidity which is an attribute of assets of the company for the quick conversation into cash. Operational companies strive to maintain liquidity, or capability to meet their obligations in time (Šarlija & Harc, 2012). Consequently, liquidity management is vital for all companies (Saleem & Rehman, 2011). In banking, loan-to-deposit ratio (LTD) explains that loan to deposit assesses the extent to which customer deposits finance customer loans and this ratio reflects bank's liquidity (Lassoued, Sassi, & Attia, 2016; Makri *et al.*, 2014). Dimitrios *et al.* (2016) declare LTD as one of the proxies for quality and riskiness of management.

The growing loans to deposits ratio tells about preference of risk and is likely to result in the high level of NPL (Dimitrios *et al.*, 2016). Somewhat similar result is reported in Ahmad and Ariff (2007) study where the loan-to-deposit ratio (LTD) expects that the higher the portfolio of loan in comparison with the deposit size, the greater should be the chances of default of a loan, they conclude a positive relationship between LTD ratio and NPL. Bacha (1998) also corroborates this result while identical results are reported by other

studies (Louzis *et al.*, 2012; Misra & Dhal, 2010) and only in case of private banks (Cheng *et al.*, 2016). Ahmad and Ariff (2004) study implies that a higher LTD ratio indicates excessive gearing and the increase in bank risk is contributed by excessive lending while Lassoued, Sassi and Attia (2016) suggest that banks with important level of loans compared to deposits take less risk. Cheng, Lee, Pham and Chen (2016) argue that the banks face an increased demand for loans, which results in lower loan quality and the higher the NPL ratio.

On the other hand, many studies report negative relationship between LTD and NPL (Durafe & Singh, 2016; Swamy, 2012) in state-owned banks (Cheng *et al.*, 2016) and in foreign banks (Abdullah, Khan, & Nazir, 2012). It implies that borrowers assign more consideration to credit (customer) oriented banks (Durafe & Singh, 2016; Ranjan & Dhal, 2003; Swamy, 2012). Cheng *et al.*, (2016) argue that when banks reduce loans and strengthen their quality of the loan, and the LTD decreases as well. It will also decrease NPL. They further explain that people show greater confidence towards state-owned banks and they prefer to keep their deposits in the public banks. Therefore, the LTD ratio decreases as deposits increase, results in higher the bank's NPL. Hence, LTD has a negative significant impact on NPL of the bank that is in line with the "moral hazard hypothesis".

Universiti Utara Malaysia

Table 2.8
Loan-to-Deposit Ratio and NPL

S#	Author	Data	Country / (ies)	Methodology	Results
1	Ahmad and Ariff (2007)	1996-2002	9 Developed and emerging	Parsimonious Regression	Positive
2	Dimitrios *et al.* (2016)	1990-2015	15 Euro-area countries	GMM	Positive
3	Ahmad and Ariff (2004)	1994-2000	Pakistan	Parsimonious Regression	Positive
4	Lassoued, Sassi and Attia (2016)	2006-2012	13 MENA Countries	2SLS	Negative[1]
5	Abdullah *et al.* (2012)	2001-2010	Pakistan	OLS and cointegration	Insign. Negative[2]
6	Cheng, Lee, Pham and Chen (2016)	1994-2008	Taiwan	Panel Regression	Negative[3]
7	Durafe and Singh (2016)	1999-2013	India	Panel Data Model	Negative
8	Swamy (2012)	1997-2009	India	Panel Data Analysis	Negative
9	Jameel (2014)	2000-2010	Pakistan	Multiple Regression Model	Negative Insign.
10	Makri *et al.* (2014)	2000–2008	14 countries of Eurozone	GMM	Insignificant
11	Nor and Ahmad (2015)	2005-2013	Pakistan	Hierarchical Multiple Regression	Insignificant
12	Ganić (2014)	2002-2012	Bosnia and Herzegovina	Panel Data Regression Model	Insignificant

Source: Author's compilation from Literature

[1] LTD and Bank Risk Taking has inverse relation.
[2] Loans-to-deposits ratio has positive but insignificant relationship with NPL in domestic banks while in case of foreign banks, it is negative and significant.
[3 & 4] negative relationship between Loan-to-Deposit Ratio and NPL in State owned banks.

Universiti Utara Malaysia

While some other studies conclude insignificant association between LTD and credit risk as Nor and Ahmad (2015) in their study on Banks in Malaysia, (Makri *et al.*, 2014) in their study on 14 countries of the Eurozone, Ganić (2014) in his study in Bosnia and Herzegovina, Jameel (2014) in her study in Pakistan, and Abdullah *et al.*, (2012) in their study for domestic banks of Pakistan.

Based on the previous studies, it can be seen that there exists an inconsistency between the relationship of LTD and NPL. The table on it shows the findings of some the most important studies on this relationship.

2.4.3 Performance via Profitability [Return on Assets (ROA)]

Return on Assets (ROA) represents performance through bank profitability. *Dimitrios et al.* (2016) explain that ROA explains the bank's managerial efficiency for the conversion of its assets into returns (profits). They take it in their study as one of the proxy for quality and management's riskiness. Ghosh (2015) also uses return on assets (ROA) of banks as a measure profit. Many other studies use ROA as a measure of bank performance (Athanasoglou *et al.*, 2008; L. J. Cohen *et al.*, 2014; Vithessonthi, 2016). Louhichi and Boujelbene (2016) support the view that bank profitability represented by ROA is also usually linked with bank risk. The results related with the significant and positive association among bank credit growth and profitability (ROA) is consistent with Becker and Ivashina (2014) who demonstrate that bank loan's supply is based partially on the bank profitability. Dimitrios *et al.* (2016) and Swamy (2012) find that ROA is strongly associated with the NPL.

Theoretically, it is well established through 'Bad Management' hypothesis by Berger and DeYoung (1997) that poor management is leading towards the risky activities and poor performance or when the ROA has increased, it is resulting in lesser amount of NPL (Makri *et al.*, 2014; Swamy, 2012). In other words, good management should lead to lower credit risk or lower NPL (Dimitrios *et al.*, 2016). It implies that ROA finds a statistically significant negative association with NPL (Bawa et al., 2019; Louhichi & Boujelbene, 2016; Vithessonthi, 2016; Chaibi and Ftiti, 2015; Tehulu and Olana, 2014; Makri *et al.,* 2014; Erdinç and Abazi, 2014; Messai and Jouini, 2013; Shingjergji, 2013; Mehmood, Irshad and Ahmed, 2013; Swamy, 2012; Zribi and Boujelbène, 2011; Boudriga *et al.,* 2009; Boudriga *et al.,* 2008; Godlewski, 2005; Boudriga *et al.,* 2010; Cotugno, Stefanelli, and Torluccio, 2010; and Louzis *et al.,* 2012).

Profitability of bank is associated with the risk-taking behavior of banks (Boudriga *et al.*, 2008; Makri *et al.*, 2014). Banks are usually uncovered, when tries to generate revenue due to pressure and thus forced to indulge in loan offers that are risky (Boudriga, Boulila, *et al.*, 2009; Boudriga *et al.*, 2008). So, the banks might strive towards increasing profits by

Table 2.9
Return on Assets and NPL

S#	Author	Data	Country	Methodology	Results
1	Dimitrios *et al.* (2016)	1990-2015	15 Euro-area countries	GMM	Negative
2	Louhichi and Boujelbene (2016)	2005-2012	8 MENA countries; Bangladesh & Indonesia (10 countries)	GMM and Panel Vector Autoregressive (PVAR)	Negative
3	Ghosh (2015)	1984-2013	US	GMM	Negative
4	Makri *et al.* (2014)	2000–2008	14 countries of Eurozone	Dynamic Panel Regression and GMM	Negative
5	ERDİNÇ and ABAZİ (2014)	2000-2011	20 Emerging Europe countries	Poled OLS (Fixed & Random Effect) Model and GMM	Negative
6	Mehmood, Irshad and Ahmed (2013)	2003-2012	Pakistan	Fixed Effect Model	Negative
7	Boudriga *et al.* (2008)	2002-2006	12 MENA countries	Random Effect Regression	Negative
8	Swamy (2012)	1997-2009	India	Panel Data Analysis	Negative
9	Vithessonthi (2016)	1990-2013	Japan	OLS and GMM	Insignificant
10	Jakubík and Reininger (2014)	2004-2012	9 CESEE countries	GMM	Insignificant
11	Ganić (2014)	2002-2012	Bosnia and Herzegovina	Panel Data Regression Model	Positive Insignt
12	Boudriga *et al.* (2009)	2002-2006	59 countries	Panel Data Regression	Insignificant

Source: Author's compilation from Literature

Universiti Utara Malaysia

initiating the higher levels of risk (Vithessonthi, 2016) that might lead to an increase in NPL which end in the decline of profits finally (Makri *et al.*, 2014). Alternatively, highly profitable banks are less pressured for the revenue creation and consequently less constrained to engage in risky credit offering (Boudriga, Boulila, *et al.*, 2009; Boudriga *et al.*, 2010; Hu *et al.*, 2007; Louhichi & Boujelbene, 2016). Because these banks have fewer incentives to engage in high-risk activities (Dimitrios *et al.*, 2016; A. Ghosh, 2015; Makri *et al.*, 2014) therefore, they are engaged in more prudent and careful lending (Ghosh, 2015; Jakubík & Reininger, 2014) causing a reduction in NPL (Boudriga, Boulila, *et al.*, 2009; Ghosh, 2015). The same is explained by Berger and DeYoung (1997) in 'bad management' hypothesis or 'management quality' about this negative relationship where bad management leads both to riskier activities and weak performance (Ghosh, 2015) and vice versa (Jakubík & Reininger, 2014) because inefficient management is lacking abilities to efficiently evaluate and control risks incurred while loaning to new customers (Boudriga, Boulila, *et al.*, 2009; Boudriga *et al.*, 2008). This will bring capital losses at high degree and poor performances (Boudriga *et al.*, 2008).

Although limited to this literature review, there is no study found that report positive relationship of profitability with NPL but when new born banks are in rush to capitalize market, they play with figures of profitability and NPL during the illegal practices of earning management. Ghosh (2015) refer to Rajan (1994) who quote a report in U. S. Banker (a magazine), October 1990 when a bank misstates its profits on heavy lending which is an example of higher profits could lead to also increase in NPL. Rajan (1994) explains that it can happen that managers inflate profits by manipulating earnings at the

Universiti Utara Malaysia

expense of future NPL when policy about lending caters reputation. Thus, increase in profitability give rise to NPL.

While some of the studies could not confirm a significant association of profitability on NPL (Boudriga, Boulila, *et al.*, 2009; Ganić, 2014; Jakubík & Reininger, 2014; Vithessonthi, 2016). Boudriga, *et al.*, (2009) study is based on aggregate data from 59 countries due to availability of data. They justify by explaining that firstly, there might be no relationship at the aggregate level between profitability and NPL, while at the bank / firm level it may exist. Secondly, there is no association at all exist between profitability and NPL and it might be due different level of profitability adopted by the countries included in the sample. There are different kinds of impact by competition of reaping profits via earning on the lending activities in both developing and developed economies. Lending activities in developing countries more prone to generate NPL due to its flexibility as compared to developed countries. Based on the previous studies, it can be seen that there exists an inconsistency between the relationship of profitability (ROA) and NPL. Table 2.9 shows the findings of some the most important studies on this relationship.

Universiti Utara Malaysia

2.5 Moderating Factor Institutional Investors (II)

After careful analysis of background, problem and context of the problem, institutional ownership is selected as moderating factor. Institutional ownership henceforth termed as institutional investors in the study. Institutional investors refer to the percentage of shares held by institutional owners in the ownership structure of a bank. Moderating variable is a third variable introduced to check the cause of weak or inconclusive relationship between independent and dependent variables more clearly while

mediating variable is introduced when there is already strong relationship between independent and dependent variables and mediating variable creates a link between two eradicating the direct relationship between them (Namazi & Namazi, 2016). Here, in this study there exist weak or inconsistent relationship between each internal variable (CAR, LTD, ROA) and NPL. Therefore, introduction of moderating variable suits the situation and institutional investors is selected as moderating variable due to its contextual importance in Pakistan. Given the inconsistency regarding the impact of CAR, LTD and ROA on NPL, many studies emphasize on the role of institutional investors in risk taking behavior. For instance, Adjei-mensah, Amidu and Abor (2015) while arguing agree with Shleifer and Vishny (1986) on institutional investors' comparative superior monitoring skills and efficient management of banks to individual investors who may not have the time, resources and sufficient clout to monitor managers. Based on this, institutional investors are more conscious and more competent than the other shareholders (Pearce & Zahra, 1992), so they are the influential partners for the bank. Moreover, they have better access to information (M. Jensen, 1993) and are very active in controlling the managing team (Boussaada & Labaronne, 2015; Whidbee, 1997). Therefore, institutional investors tend to induce managers to reduce the level of NPL in their portfolio and develop strategies to attract quality loans (Adjei-mensah *et al.*, 2015; Shleifer & Vishny, 1986). Adjei-mensah, Amidu and Abor (2015) refer to Shleifer and Vishny (1986) who indicate that agency problems are minimal in firms with concentrated ownership due to their ability to monitor management activities.

Institutional investors who exercise significant voting power can shape the nature of corporate risk taking (Barry *et al.*, 2011; Lamy, 2012). In terms of shareholder size and

expertise in obtaining, processing and interpreting information to carry out the necessary oversight action and to monitor managers (T. A. Barry et al., 2011; Hammami & Boubaker, 2015), such investors are different from atomistic individual investors because they have a much stronger influence than atomistic individual investors (T. A. Barry, Tarazi, & Wachtel, 2019) and they can exert greater control and power for reasons of economies of scale in corporate supervision. Therefore, they can influence the decisions of managers in terms of risk-taking (Hammami & Boubaker, 2015). Pound (1988) highlights that institutional investors can exercise a control at a lower cost as they have more experience (T. A. Barry et al., 2011; T. Barry, Lepetit, & Tarazi, 2008) and being represented on the board as controlling partner at the same time, they also influence important governance choices to enhance their monitoring ability (Lamy, 2011). Moreover, their dual role as creditor and shareholder, further ensure monitoring activity and management discipline and it ultimately contributes to better governance and generates a positive perception by the financial market (Hamza, 2009).

Universiti Utara Malaysia

2.5.1 Moderation on the relationship between CAR and Bank Risk Taking

Based on aforementioned arguments, this study contends that institutional investor may moderate impact of CAR, liquidity and performance on NPL. According to Shehzad, de Haan and Scholtens (2010), CAR positively affected by ownership concentration, and as the result ownership concentration reduces the bank riskiness. Further, role of institutional investors in moderating the relationship of CAR with risk taking can be supported by findings of other studies, although their findings show that risk taking increases with high institutional investment. For instance, Rahman, Ahmad and Abdullah (2012) stated that negative relationship between institutional ownership (investors) with Z-SCORE in a low CAR condition implies that higher institutional

ownership (investors) would increase insolvency risks or probability of failure of banks. Other studies do agree with similar standpoint that institutional investors exhibit comparatively more risk-taking behavior than individual/family or government owners due to their focus on short-term returns (Ashraf, Ramady, & Albinali, 2016; T. A. Barry et al., 2011; Berger, Clarke, Cull, Klapper, & Udell, 2005; Chou & Lin, 2011; Hossain, Jain, & Mitra, 2013). So, the Institutional-owned banks are less stable than other banks (T. A. Barry et al., 2011; Hammami & Boubaker, 2015; Iannotta, Nocera, & Sironi, 2007; Laeven, 1999).

This positive relation is consistent with the findings of (Barry *et al.*, 2008, 2011; Hammami & Boubaker, 2015; Hamza, 2009; Iannotta *et al.*, 2007; Laeven, 1999; Lamy, 2012; Rahman *et al.*, 2012). Wright, Ferris, Sarin and Awasthi (1996) not only find that a higher level of involvement of institutional investors leads to a greater probability of bank default but it also increases NPL of banks (T. A. Barry et al., 2011).

Universiti Utara Malaysia

2.5.2 Moderation on the relationship between Liquidity and Bank Risk Taking

Likewise, the impact of liquidity (LTD) on NPL may also be moderated by institutional investors. According to Barry, Lepetit and Tarazi (2008) institutional investors will encourage more risky activities that maximize bank value because their portfolios are sufficiently diversified. As the main goal of institutional investors is to optimize their financial gains, which they can achieve by holding a diversified investment portfolio, which make them more concerned about maximizing shareholder value and liquidity (Aggarwal, Erel, Ferreira, & Matos, 2011; Thomsen & Pedersen, 2000). Institutional investors might therefore have a strong preference for higher risk-taking by the banks they control as long as net present value is positive (Lamy, 2011). It may reduce the

liquidity within the bank resulting in higher LTD ratio. Based on this premise this study intends to examine the moderating role of institutional investors on the NPL.

2.5.3 Moderation on the relationship between Profitability and Bank Risk Taking

Similarly, institutional investors may also moderate the relationship of profitability (ROA) and NPL. According to Dimitrios *et al.* (2016), profitability measured as return on assets indicates the performance that how assets are used to generate revenues . Thus, to show high ROA, banks may issue risky loans (Vithessonthi, 2016). Jamil, Said and Nor (2015) is in favor of the view that the stability of a bank is reflected by the degree of the risk taking of the bank but at the same time institutional investors and non-financial companies impose the riskiest strategies when they hold higher stakes (T. A. Barry et al., 2011). Saghi-Zedek (2016) and Lim, Minton and Weisbach (2014) confirm that the institutional investors are generally involved in term and riskier syndicated loans and therefore they have a habit to manage riskier activities. Lamy (2012) highlights that institutional investors as a group are less likely to expropriate other. Thus, the impact of firm profitability (ROA) on NPL may increase or decrease with moderating effect of institutional investors.

2.6 Related Theories

The study underlying model is supported by three theories namely, Theory of Financial Intermediation, Agency Theory and Modern Portfolio Theory. These theories and selected variables are connected to provide a theoretical base of the study while it also provided an empirical evidence through econometric modeling and regressions. These theories are explained in context of this in following subsection:

Universiti Utara Malaysia

2.6.1 Theory of Financial Intermediation

It is the financial institutions that take the funds from the depositors, investors or fund provider and lend it to customers or borrowers who are deficient or in need of funds. Diamond (1984) developed this theory. The theory elaborates the role of intermediaries regarding all the risks related to financial assets dealings, intermediaries (Allen & Santomero, 1997). Accordingly, matching the needs of all fund providers like investor, depositors and lenders and fund seekers like individual customers or borrower from the businesses following the ethical and good manners. The bank, in the likewise situation, act as a middleman or a party in between fund providers and fund seekers. They collect this money from investors or depositors and can either invest it or lend it to their customers. The financial markets are thus, formally developed with enhanced role of these financial intermediaries. Over many recent years, the role of intermediaries transformed the financial system dramatically in several countries due to increased role of technology (in bringing the information readily available, thus, reducing transaction cost and minimizing information asymmetry). The risk management has taken a pivotal and main role in financial intermediaries (banks) activity and it changed their focus on various financial contracts risks and its trading.

Banks helps in financial trading and plays the role of financial intermediary by channelizing funds from savers to borrowers in the form of loans by pooling the savers funds. Banks also facilitate its customers by performing the functions of risk manager as they share risk by diversifying its investment and loan portfolios (by avoiding these loans to be NPL), liquidity provider due to big pool of funds, banks' customers can receive their funds on demand. Moreover, with this liquidity, banks can facilitate deficit units with adequate finances. Banks have advantage of its skills, expertise and

experience and they have better access to market and information. They provide premier information to their customers at affordable cost that otherwise all customers could not get (Hubbard, 2002).

In addition, the financial intermediation theory expected that there is a positive correlation between systemic banking crises and shocks that unfavorably affect the income performance of banks' customers that this impact cannot be mitigated through risk diversification (Rennenberg, 2012). Moreover, less capitalized banking system would be more vulnerable to systemic banking crises. The bank would experience high nonperforming loans during bad economic condition. For example, an increase in lending rates cause the customer to incur high installment amount which give more burden in meeting his or her monthly obligation. On the other hand, this causes the banks to have lower profits and high default or NPL.

Universiti Utara Malaysia

Though, Ciancanelli and Reyes-Gonzalez (2000) reported that in carrying out the intermediary functions, banks might involve in a behavior of self-interest by extending loans to risky borrowers in order to benefits from high returns. The problem is more critical in banks with high concentration of ownership whereby the heavy-weights in banks' shareholding structure may indulge in comparatively risky activities in order to increase their own benefits at the cost of other creditors (Pinteris, 2002).

Diamond (1984) describes banks act on behalf of their creditors in order to overcome problem of asymmetry information. Banks play a role in investigating and monitoring the activities of their existing and potential borrowers to ensure that their creditors' interests are protected, and the banking business is conducted soundly. In achieving this

objective, banks have to conduct their business efficiently and diligently by allocating creditors money to profitable and productive investments with acceptable risk. By doing so, bank could ensure better safety and higher liquidity to borrowers at all times (Ahmad, 2003). Likewise, if banks do not monitor their activities as delegated, agency problems might arise. For instance, if banks invest customers' deposits in high risk projects or assets, agency problem occur if banks do not constantly monitor the investments and react quickly when signs of risks prevail.

2.6.2 The Agency Theory

Agency relationship is explained by Jensen and Meckling (1976), as "a contract under which one or more persons (principal) engage another person (agent) to perform some service on their behalf which involves delegating some decision making authority to the agent. If both parties to the relationships are utility maximizers, there is a good reason to believe that the agent will not always act in the best interests of the principal". The agency theory states that management acts as an agent on the behalf their stockholders. It keeps control mechanism separate from ownership. An agency relationship is based on the premise that there is a contact among owners (the principals) and management (the agent) that gives the management an authority delegated by the owners to act on the behalf of the owners to perform some functions and activities related to decision making (Palia & Porter, 2007).

Berger and Patti (2006) suggest that to achieve economic efficiency and firm value, the top management is assumed to act in the best interests of stockholders. While it is also argued that, the agency theory has fortified the management practice that results in an opportunity for the managers to act in the self-interest rather than interests of the stake

Universiti Utara Malaysia

holders. Therefore, the agency problem is arising due to the conflict of interests among management and stakeholders and their respective interests define their objective. Due to dissimilar objectives and increasing risk and uncertainty towards achieving a common goal of doing business for profit.

The conflict of interests of each involved party and consequent agency cost can be observed with following explanations: Banks accumulates money from the investors (depositors) and invest in the debt or equity claims of borrowers. This situation highlights a conflict of interests i.e. among depositors and bank, and between a bank and borrowers. Depositors and shareholders are interested in getting an appropriate return with an acceptable risk level. As compared to this, the management of the bank may involve in high risk activities that may result in the loss of wealth of depositors and shareholders. Therefore, the main objective behind the credit assessment and appraisal process is carried out to make sure that customer has capacity to pay back the principal amount and the interests in timely fashion. On the other hand, weak borrowers may obtain benefits by non-disclosure of information that is important for the evaluation of credit process.

As a result, the non-disclosure of information (asymmetric information) may result in wrong decisions i.e. granting loans to unqualified borrowers by the banker (adverse selections) may put bank on the bank high NPL. However, management of banks is impacted by their ownership structure (Nam, 2004). The existence of large shareholders affects decisions making in banks and are associated with self-serving behavior whereby banks are inclined to make decisions which could maximize their personal

Universiti Utara Malaysia

benefits at the cost of the creditors of the bank. In banking, this decision is highly related to risk taking of banks (Pinteris, 2002).

Monitoring mechanisms may control the level of NPL taken by the bank. Higher level of institutional investment in any bank will induce the management to consider their desired risk level. According to (Pearce & Zahra, 1992) institutional investors are more concerned about the bank as compared to the other shareholders. Moreover, their monitoring skills are also higher as compared to the other investors (Adjei-mensah *et al.*, 2015; Shleifer & Vishny, 1986). Furthermore, influential role of institutional investors compel the management to control the level of NPL (Adjei-mensah *et al.*, 2015; Boussaada & Labaronne, 2015; Shleifer & Vishny, 1986; Whidbee, 1997). Based on these arguments, this study intends to use the moderating role of institutional investors regarding the relationship of internal (bank specific) variables and NPL.

Universiti Utara Malaysia

2.6.3 Modern Portfolio Theory

Modern portfolio theory is basically a theory of investment and developed by Markowitz in 1952. It suggests that it is possible to construct an "efficient frontier" of optimal portfolios, offering the maximum possible expected return for a given level of risk (Markowitz, 1952). This theory is applied to banking sector and also in bank's loan portfolios in literature (Larr & Stampleman, 1993) where bank loans are taken as investment portfolios for the banks. This theory categorizes the risk into systematic (external or macroeconomic) risk and unsystematic (internal or bank-specific) risk where unsystematic risk can be managed to achieve optimal loan portfolio.

In market economy, the economic cycle is considered as natural phenomenon. The economic cycle is consisting of many stages of growth like peak, bottom and recession. The first phase of the economic cycle of the countries is over heated and linked with the high level of gross domestic product (GDP). In contrary, the recession phase follows the boom and results decline in employment rate, as well as, the decline in inflation's pressure (Baran, 2011). These changes in the macroeconomic cycle may affect the risk taking of the financial institutions. Overall changes in the economy are those systematic changes that may affect all the firms in the market (Mileris, 2015). GDP, BCPS, corruption and political stability (Teker *et al.*, 2013), lending interest rate (R. Beck et al., 2015), unemployment rate (Mileris, 2015) are among external or macroeconomic (systematic risk) factors. Energy consumption has positive interdependent relation with GDP growth (Payne, 2009) and thus is also an external factor affecting systematic risk of loan portfolio while CAR, LTD and ROA are identified as unsystematic risk and GDP growth and lending interest rate as systematic risk factors by (Swamy, 2012).

Universiti Utara Malaysia

The shocks in macro-economic variables reflects in banks' balance sheets through a channel of transmission of NPL. Furthermore, such channel follows the deterioration in the quality of credit of loan portfolios. It can also become a cause of significant loss to the banks or can even cause a banking crisis. A large number of researchers found that bank loan portfolio quality can be explained by both macroeconomic conditions and other idiosyncratic features.

Many studies document the influence of the macroeconomic risk on banks' financial condition. In addition, the macroeconomic downturn influences the loan portfolio diversification level. The homogeneity of bank portfolios would increase in response

to an increase in macroeconomic risk and uncertainty. The deteriorating information quality should lead to a narrowing of the cross-sectional composition of bank portfolios, as banks reducing the risk tend to allocate assets in their portfolio more homogeneously when macroeconomic uncertainty increases (Calmès & Théoret, 2014).

Therefore, Markowitz modern portfolio theory relates to NPL of banks where risk of converting a loan into NPL can broadly categorized into systematic (external) risk factors and unsystematic (bank-specific) risk factors. These external and bank-specific factors are reviewed and synthesized in Section 2.3 and Section 2.4.

2.7 Summary of the Chapter

A detailed and explained review of the past studies literature is given in here. The reviews have been organized on four (4) perspectives namely NPL, external and internal factors, moderating variable and related theories to the study.

Universiti Utara Malaysia

NPL review facilitates thorough understanding of the focus and motivation of the study. The gaps identified through the NPL external and internal factors reviews of the previous studies exhibits empirical evidences on the associations between these factors and NPL. While, the related theories like modern portfolio theory, theory of financial intermediation and agency theory help in understanding how NPL interact with external and internal variables. In this study, institutional investors are taken as management mechanism of overall corporate governance which is quite relevant in controlling the management of banks. However, emphasis in given in this chapter on the management of all affairs of the banking system which might influence NPL of the banks.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter starts with the research design and followed by model specification on theoretical basis that is aligned with conceptual framework of the study. The operational definition and measurement of the external and internal variables is given afterwards. Then, hypothesis development, econometric equations of panel regressions models, data collection procedures, sample selection, unit of analysis and data analysis are in queue and concludes at the summary.

3.2 Research Design

Zikmund, Babin, Carr and Griffin (2009) defined the research design as follows:

"It is a framework or blueprint for conducting the research and known as a master plan that specify the methods and procedures for collecting and analyzing the needed information." Creswell (2009) explained that research design consists of two important components: (1) identify the procedure, plan or proposal to conduct research, and (2) interaction of philosophy, strategies of enquiry and assurance of validity. It specifies the details of the procedures necessary for obtaining the information needed to structure and solve the research problem.

The development of conceptual framework is an essential step in the research methodology as it defines the path of the contribution of the study. Sekaran and Bougie (2016) defined conceptual framework as a logical, developed, described and detailed network of relationships between the variables predicted associated with the

Universiti Utara Malaysia

problematic situation and identified through such process as interviews, observation and literature review. According to Guba and Lincoln (1994), a conceptual framework is an epistemology of constructivism that assumes a pluralist and relativist analysis of the actuality. Sekaran (2003) holds the opinion that the conceptual framework is the groundwork on which the whole research project is based.

Further, Cavana, Delahaye and Sekaran (2001) highlighted that research framework represents a model of relationships between the factors which flow logically from the citation of previous researches in the problem area. The construction of research framework is based on this basis. Hence, based on the discussion in Chapter Two, this study intends to investigate one dependent variable (NPL), independent variables which consist seven external variables (namely GDP, lending interest rate, unemployment, bank credit to private sector, energy gap, political stability index and control of corruption index) three internal variables (namely CAR. LTD and ROA) and one moderating variable (namely institutional investors).

Universiti Utara Malaysia

3.3 Model Specification on Theoretical Basis

In contemporary world, use of information technology has changed the perspective of banking theories. The role of the banks as intermediaries has also redefined because information asymmetries are not as relevant in their intermediation activity as it was before the use of information technology. While at the same time, the importance of banks as financial intermediaries has multiplied. It shows that the paradigm has shifted to value creation for its clients. This value creation is due to the increased emphasis on risk and risk management because handling risk become the pivotal function in banking business. The risk and risk management covers the gap between the supply of deposit

savings and the demand for loans and investments. When it comes to the business of loans, the risk means counterparty risk, default risk and credit risk. All these risks somehow generate from nonperforming loans (NPL).

Bank business is mainly managing and monitoring loans because these are major earning assets of banks. According to Markowitz theory, an efficient loan portfolio which is sufficiently diversified can help reduce the risk of converting a loan into NPL. The purpose of diversification is to minimize bank exposures to risk. The expected return of banks assets which is primarily from loans should be unrelated and should not move together. Thus, the banks' management should use statistical measures to select portfolio of loans that have zero covariance rather than equal one, the positive return on one loan offsets the loss on another (Thygerson, 1995). This can be done through diversification in different type of loans and a different geographic area. Thus, the loan portfolio risk is function of risk and can be written as:

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$$LoanPortfolioRisk_{t} = f(\text{Risk}_{t}) \ldots\ldots\ldots\ldots\ldots (3.1)$$

This loan portfolio risk may arise from overall environment or from within bank which was termed as “Bad Luck” hypothesis and “Bad Management” hypothesis respectively. These hypotheses are first discussed in a landmark study by Berger and DeYoung (1997). “Bad Luck” hypothesis explains the factors of NPL that are external and beyond the control of bank management. These are the same factors named as systematic factors by Mankowitz in modern portfolio theory. While “Bad Management” hypothesis explains the factors that are manageable by the banks internally. These are also called systematic and un-systematic risk factors. So, the banks are now creating value for its clients by performing intermediation role as a risk manager via diversifying

the bank loan portfolio risk managing both systematic and un-systematic risks. The risk or risk management is function of systematic and un-systematic risks and can be represented as:

$$LoanPortfolioRisk_{\mathrm{t}} = f(\mathrm{SystematicRisk_t}, Uns\mathrm{systematicRisk_t}) \ldots\ldots\ldots\ldots (3.2)$$

Where Loan Portfolio Risk of individual bank at any point in time can be given as the ratio of non-performing loans to total loans of that bank which is denoted by NPL in the study. The total risk is sum of the systematic risk (i.e. generated by the external factors in the system and affect all banks' loan portfolios equally) and unsystematic risk (i.e. generated by the internal factors of the bank and each bank can minimize it with better management). So, we can write equation 3.2 as:

$$NPL_{\mathrm{t}} = f(\mathrm{ExternalFactorsRisk_t}) + f(InternalFactors\mathrm{Risk_t}) \ldots\ldots\ldots\ldots\ldots (3.3)$$

The economic growth is the overall indicator of external environment (Kuzucu & Kuzucu, 2019) which is basically the annual growth percentage represented in a ratio that indicates total sum of all goods and services produced by a country in a year (Farooq, Elseoud, Turen, & Abdulla, 2019). Similar to GDP growth rate other external factors that are taken into account in the study through theoretical basis are, lending interest rate, unemployment rate, bank credit to private sector, energy gap, political instability and corruption. The discussion on the impact of these external factors on NPL are discussed in details Chapter 2, Section 2.3.

The internal factors which are primarily bank-specific factors are included in the model under "Bad Management" hypothesis. This study included capital adequacy ratio (CAR) as regulatory measure, loan-to-deposit (LTD) ratio as liquidity measure and

return on assets ratio (ROA) as performance and profitability measure. While size of the bank and loan loss provisions are taken into account as control factors. These factors are explained in Chapter 2, Section 2.4. Therefore, the model after including all these factors would be as in equation 3.4:

$$\boldsymbol{NPL_t} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\mathbf{GDP_t} + \boldsymbol{\beta_2 LIR_t} + \boldsymbol{\beta_3 UR}_{\mathbf{t-1}} + \boldsymbol{\beta_4 BCPS_t} + \boldsymbol{\beta_5 LNEG_t} + \boldsymbol{\beta_6 PSI_t} + \boldsymbol{\beta_7 CCI_t} + \boldsymbol{\beta_8}\mathbf{CAR_t} + \boldsymbol{\beta_9}\mathbf{LTD_t} + \boldsymbol{\beta_{10}}\mathbf{ROA_t} + \boldsymbol{\beta_{11}}\mathbf{LNSIZE_t} + \boldsymbol{\beta_{12}}\mathbf{LNLLP_t} \ldots\ldots\ldots\ldots (\mathbf{3.4})$$

The conceptual frameworks of the study are given in Figure 3.1 and Figure 3.2 respectively on the following page.

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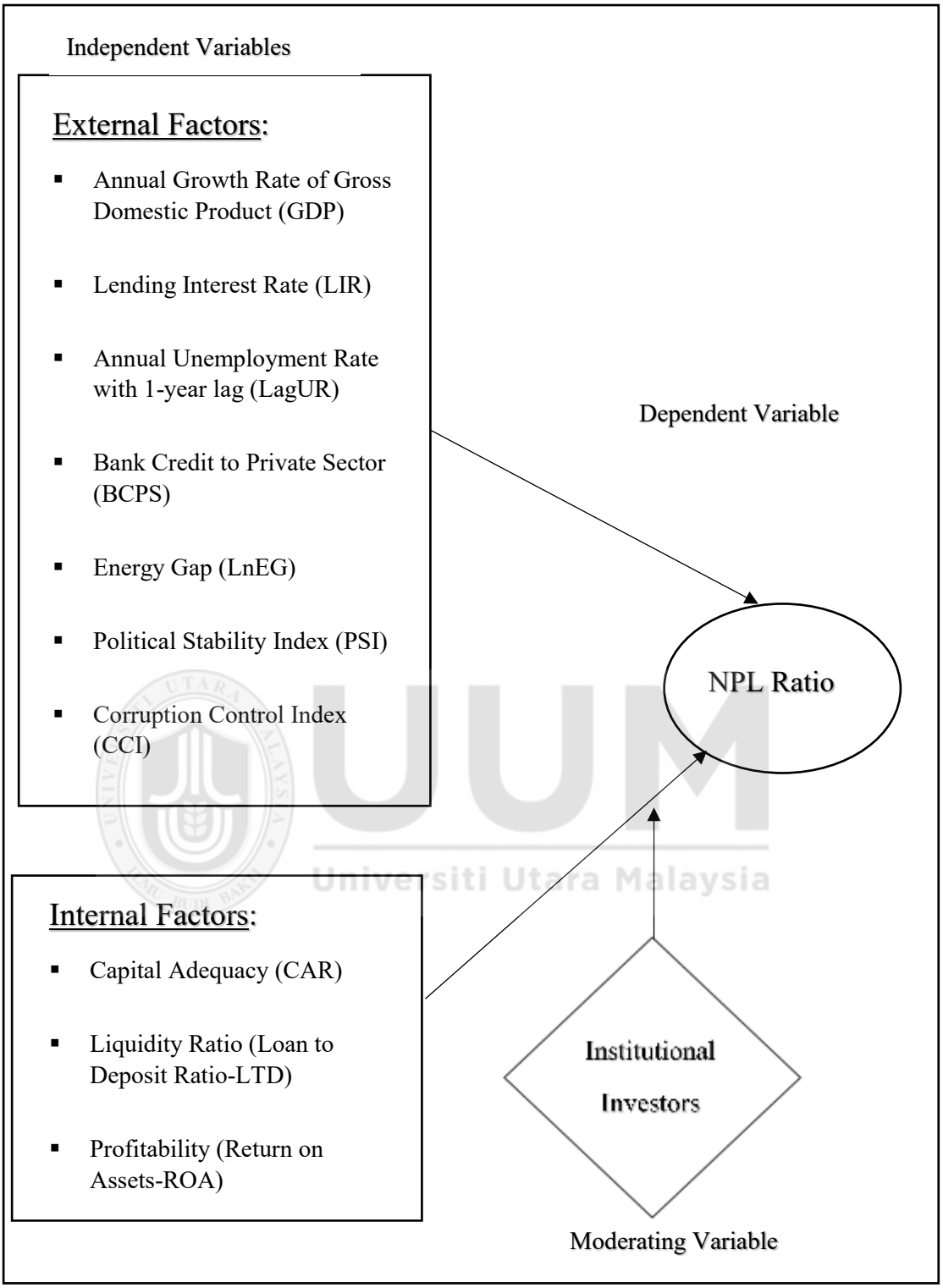

Figure 3.1
The Conceptual Framework for NPL Determinants of conventional Banking in Pakistan

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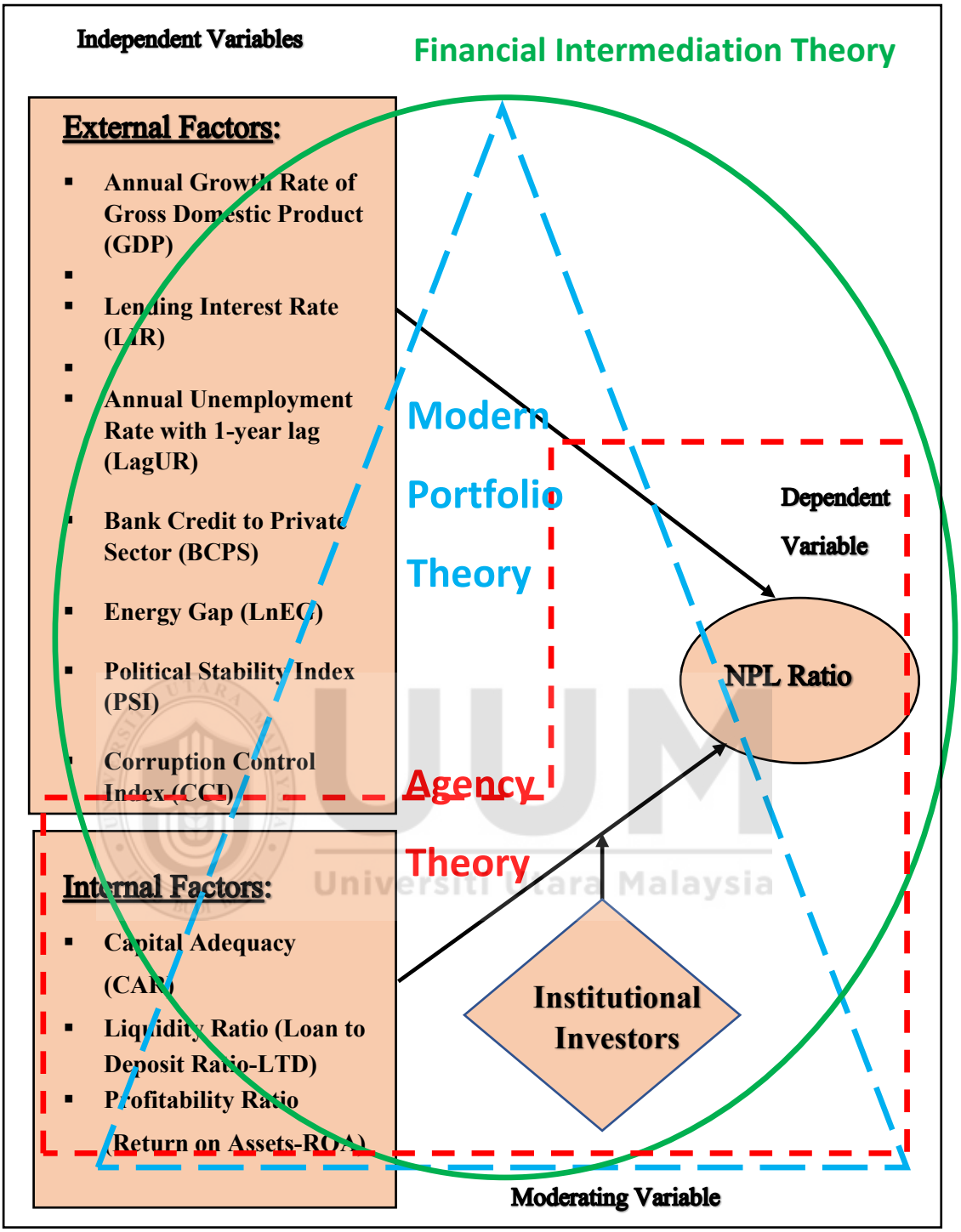

Figure 3.2
The Related Theories Model with Conceptual framework

Figure 3.2 shows the integration of three (3) theories which are Agency Theory, theory of Financial Intermediation and Modern Portfolio Theory with external and internal variables and moderating variable that can improve the risk and poor management especially on NPL of banks in Pakistan.

Theoretically, Agency Theory explained the focus of internal resources specifically better management by aligning the interests of owners and managers in the bank which plays a key role in containing and lowering the levels of NPL. In theory, if the conflict of interest is minimized between owners and managers in a bank, resources could be utilized efficiently and lending would be available to only good projects and it would help to curb the NPL.

Meanwhile, theory of Financial Intermediation revealed that banking business is involved with the external and internal factors that influenced the NPL of the banks. Further, Modern Portfolio Theory in banking attempts to maximize loan portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets (loans). Banks actively pursue loan portfolio diversification to minimize expected loans defaults and thus NPL. Loan portfolio diversification caters the risk generated from external factors and from internal factors.

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3.4 Operational Definition and Measurement

Operational definition is an idea to provide what each question is trying to evaluate by looking at the behavioral variables, facets or properties denoted by the conception (Cavana *et al.*, 2001). Meanwhile, Zikmund *et al.*, (2009) defined the operational as the procedure of identifying scales that communicate to difference in concept to be implicated in a research process. Hence, the dependent variable in this study is NPL and independent variables are GDP, lending interest rate, unemployment, bank credit to private sector, energy gap, political stability index, corruption control index, capital adequacy ratio, loan to deposit ratio, return on assets and institutional investors as

a moderating variable. Table 3.1 presented the summary of definition and measurement of this study:

Table 3.1
Operational Definitions and Measurements

S	Variable	Symbol	Measurement	Author(S)
1	Non-Performing Loan Ratio	NPL	Non-performing loan divided by total loans	(Beck, Jakubik, & Piloiu, 2013; Park, 2012; Shehzad, de Haan, & Scholtens, 2010; Škarica, 2014; Swamy, 2012)
2	Gross Domestic Product Growth	GDP	Annual percentage growth rate of Gross Domestic Product	(Beck, Jakubik, & Piloiu, 2015; Castro, 2013; Dimitrios, Helen, & Mike, 2016; Makri, Tsagkanos, & Bellas, 2014; Nor & Ahmad, 2015)
3	Lending Interest Rate	LIR	Average annual lending Interest rate	(Beck *et al.*, 2015; Fofack, 2005; Jiménez & Saurina, 2004; Muntean, 2014)
4	Unemploy -ment Rate	UR	Number of unemployed persons divided by total labor force	(Bucur & Dragomirescu, 2014; Castro, 2013; Kanyinji, 2016; Louzis *et al.*, 2012; Nkusu, 2011; Vatansever & Hepsen, 2015)
5	Bank Credit to Private Sector	BCPS	Total bank credit to the private sector divided by GDP	(Akinlo & Emmanuel, 2014; Erdinç & Abazi, 2014; Jakubík & Reininger, 2014; Konstantakis *et al.*, 2016; Shaffer, 2008)
6	Energy Gap	EG	Difference in Electricity Demand and Electricity supply of the country	(Bhattarai, 2014; Farhan et al., 2012; Keeton & Morris, 1987)
7	Political Stability Index	PSI	Developed by World Bank based on ranking ranges from 0 to 100	(Balkan, 1992; Eichler, 2017)
8	Control of Corruption Index	CCI	Developed by World Bank based on ranking ranges from 0 (high corruption) to 100 (low corruption)	(T. Beck, Demirgüç-Kunt, & Levine, 2006; Boudriga *et al.*, 2008, 2010; Boudriga, Taktak, *et al.*, 2009; Bougatef, 2015; M. Chen *et al.*, 2015; Goel & Hasan, 2011; Nor & Ahmad, 2015)
9	Capital Adequacy	CAR	Capital Adequacy Ratio	(Boudriga et al., 2008; Das & Ghosh, 2007; Godlewski, 2005; Vatansever & Hepsen, 2015)
10	Liquidity	LTD	Total Loans divided by Total deposit	(Ahmad & Ariff, 2004; Cheng, Lee, Pham, & Chen, 2016; Dimitrios *et al.*, 2016; Sinkey & Greenawalt, 1991)
11	Profitability	ROA	Return divided by total assets	(Boudriga, Boulila, *et al.*, 2009; Dimitrios *et al.*, 2016)
12	Institutional Investors	II	Percentage of shares held by institutions divided by total number of shares	(Adjei-mensah *et al.*, 2015; Barry *et al.*, 2011; Hammami & Boubaker, 2015; Lamy, 2012)

Source: Author's extraction from literature

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3.5 Hypotheses Development

This section elaborates the development of the hypotheses of this study. The conceptual framework of the study helped in developing hypotheses accordingly.

3.5.1 External Factors

The external factors that were selected for the study are gross domestic product, lending interest rate, unemployment rate, bank credit to private sector, energy gap, political stability index and corruption control index.

3.5.1.1 Gross Domestic Products (GDP)

According to Hasan and Lehar (2009), GDP is about a country's economic activities. High GDP growth rate shows that the standard of living is good and increase in income per capita of the people. This situation leads to high capability and ability in loan repayment. A bank as an intermediary tends to lead the development of financial market. Diamond (1984) who developed intermediation theory, suggested that the banks are exposed to various financial risks from a range of financial contracts. GDP has a negative relationship with NPL (N. H. Ahmad, 2003; Waemustafa, 2014). It is postulated that during recession (negative GDP), there is low productivity leading to lower income. In such situation, the public are mainly bank borrowers who experience lower income or loss of employment. Consequently, it is causing them the inability to pay their debt obligation, thereby causing banks to incur the NPL. Therefore, based on the review of literature in Subsection (2.3.1), it is hypothesized that:

H_1: *GDP growth rate significantly affects the NPL of conventional banks in Pakistan.*

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3.5.1.2 Lending Interest Rate

Similar to the gross domestic product, paying capacity of individuals may reduce in case of increase in lending interest rates (Castro, 2013). Based on this argument, it can be assumed that lending interest rate is positively related to the NPL of banks. Results of many of the previous studies support this argument and reported positive impact of lending interest rate on the NPL of the banks (Akinlo & Emmanuel, 2014; R. Beck *et al.*, 2015; Castro, 2013; Erdinç & Abazi, 2014; Touny & Shehab, 2015). On the contrary, some of the studies reported that increase in interest rate may decrease the level of non-performing loans because higher lending interest rates will discourage the unhealthy lending. Thus, higher lending interest rates will be availed by only those investors to get loans who are sure about their inflows (Ahmad & Bashir, 2013). This argument has been supported by results of other studies (Bucur & Dragomirescu, 2014; Fofack, 2005). Further, studies has also reported that lending interest rate has no significant impact on the bank NPL (Climent-Serrano & Pavía, 2014; A. Ghosh, 2015; Vatansever & Hepsen, 2015). Based on these inconsistent results and others in the Subsection (2.3.2), this study hypothesized that;

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H_2: *Lending interest rates significantly affects the NPL of conventional banks in Pakistan.*

3.5.1.3 Unemployment Rate (lagUR)

As unemployment rate also indicates the level of income in the country, higher the unemployment rate in the country, there would be high probability of non-performing loans (Akinlo & Emmanuel, 2014; Dimitrios *et al.*, 2016; Nkusu, 2011; Touny & Shehab, 2015). Previous studies has reported that individual with lower income level may face cash flow problems therefore, he will not be able to meet their obligations (Akinlo & Emmanuel, 2014; Dimitrios *et al.*, 2016; Nkusu, 2011; Touny & Shehab, 2015). This argument has been supported by many of the previous studies (Akinlo & Emmanuel, 2014; Bofondi & Ropele, 2011; Konstantakis *et al.*, 2016; Touny & Shehab, 2015; Vatansever & Hepsen, 2015). On the

contrary, Shu (2002) reported that unemployment rate has no significant impact on the non-performing loans. Based on these results and other results in the Subsection (2.3.3), this study hypothesized that;

$H_{3:}$ *Unemployment rate significantly affects the NPL of conventional banks in Pakistan.*

3.5.1.4 Bank credit to Private Sector (BCPS)

Lower credit standards may increase the supply of bank credit resulting in higher non-performing loans (Konstantakis *et al.*, 2016). Many of the previous studies has reported that increase in bank credit to private sector will increase non-performing loans (Akinlo & Emmanuel, 2014; Angela & Irina, 2015a; Erdinç & Abazi, 2014; Jakubík & Reininger, 2014; Konstantakis *et al.*, 2016). On the contrary, other studies has reported that increase in bank credit to private sector may decrease the non-performing loans (Amin et al., 2014; Das & Ghosh, 2007; Fofack, 2005; Klein, 2013; Nkusu, 2011). Based on these mixed results and other results in Table 2.4, this study hypothesized that;

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$H_{4:}$ *Bank credit to private sector significantly affects the NPL of conventional banks in Pakistan.*

3.5.1.5 Energy Gap (lnEG)

Energy gap negatively affects the economic development of the country resulting in lower level of production and probability of failure to meet the obligation by firms and individuals may increase. There are many studies reporting negative economic consequences of the energy gap (C.-C. Lee, 2005; Sahir & Qureshi, 2007; Wolde-Rufael, 2005). In addition, few of the studies has also examined the impact of energy gap on the bank risk taking (Keeton & Morris, 1987; C.-C. Lee, 2005; Sahir & Qureshi, 2007). These studies have reported that energy crisis increases the bad loans and reduces the capacity of individuals and firms to meet their

obligations. It shows that energy gap may positively affect the level of non-performing loans. This study intends to hypothesize that;

H_5: *Energy gap significantly affects the NPL of conventional banks in Pakistan.*

3.5.1.6 Political Stability Index (PSI)

Lim (2001) and Wei (2000) highlighted that political stability index influence positively a country's investment inflow. Political stability index is measured by ranking from number 0 to 100. The higher the ranking the more stable a country will be. Country with stable political environment promote more opportunity for investment and further generates more economic activities. Investors are more confident to invest in such country and creates more employment opportunity. Unstable administration and political environment results in uncertainties in economic conditions and financial system. This also affects investors' confidence to do business in a country with high political instability. In instances, lower confidence causes the investors to cease their operations which lead to impact overall economic activities including high unemployment. In this instance, there is a decrease in the repayment capacity of the customers. Thus, based on the inconsistent results presented in Table 2.5, this study hypothesized that:

H_6: *There is a significant relationship between political stability index and NPL of conventional banks in Pakistan.*

3.5.1.7 Corruption Control Index (CCI)

Erickson and Hills (2006) suggested that corruption significantly defers the development of markets, discourages investment, increases cost, reduces

competitiveness, increases economic uncertainty, undermines the role of law and weakens the institutional foundation on which economic growth depends. Further, Chetwynd, Chetwynd and Spector (2003) supported Erickson and Hills (2006) that an increase in corruption, leads to reduced economic growth and increase income inequality, reduce government capacity and an increase in poverty. Mauro (2002) found that high level of corruption is associated with lower level of investment and lower GDP growth per- capita. Corruption has direct consequences on governance factors and economic growth which is dampening entrepreneurship and reduced public trust on the government institutions. Corruption could jeopardize ethical values of loan approving authorities for material benefits in self-serving behavior thereby lending to unqualified borrowers. Therefore, corruption could increase the level of NPL. Thus, based on the results of the previous studies presented in Table 2.6, this study hypothesized that:

H_7: *There is a significant relationship between corruption control index and the NPL of conventional banks in Pakistan.*

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3.5.2 Internal Factors

There are several internal factors that might affect NPL but as discussed in the background of the study and in the literature review that keeping in view the country dynamics, the most important factors which are financial health of a bank represented by CAR, liquidity of a bank represented by LTD and both profitability and performance represented by ROA are taken into account in this study.

3.5.2.1 Capital Adequacy (CAR)

According to (Swamy, 2012) higher capital adequacy may enable bank to avoid bad quality loan resulting in lower level of non-performing loans. Previous studies has reported that CAR

is negatively related to the non-performing loans (Boudriga, Taktak, *et al.*, 2009; M. Chen *et al.*, 2015; Erdinç & Abazi, 2014; Espinoza & Prasad, 2010; Jameel, 2014; Makri *et al.*, 2014; Meela & Prasad, 2016; Sinkey & Greenawalt, 1991; Zhang *et al.*, 2016). On the contrary, other studies has reported that CAR is positively related to the bank NPL. For instance, high capital restrictions may induce banks to do aggressive lending in order to increase their earnings (Godlewski, 2005; Zhang *et al.*, 2016). Many previous studies has reported that CAR is positively related to the NPL (Besanko & Kanatas, 1996; Blum, 1999; Boudriga, Boulila, *et al.*, 2009; Godlewski, 2005; Makri *et al.*, 2014; Misman *et al.*, 2015; Rime, 2001; Vatansever & Hepsen, 2015). Thus, previous studies indicate inconsistent finding regarding the impact of CAR on risk taking. Based on these mixed results and other results presented in Table 2.7, this study hypothesizes that;

H_8: *Capital adequacy ratio significantly affects the NPL of conventional banks in Pakistan.*

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3.5.2.2 Liquidity [Loan to Deposit Ratio (LTD)]

Loan to deposit indicate the banks' source of funding. Total loan divided by total deposit is used to measure the loan to deposit ratio. According to Ahmad and Ariff (2007), there are positive relationship between loan to deposit ratio and NPL. High loan to deposit ratio of the intermediaries shows that there is a high probability of high loan risk due to excessive lending. Consequently, banks experience higher loan default which leads to increase of NPL. According to Diamond (1984) theory of financial intermediation, banks as entrepreneurs manage the funds provided by the capital provider or investor by converting these into the profitable investment or business. The probability of default gets higher with the increase in loan size if the banks fail in their credit assessment. Thus, based on the results of the studies presented in Table 2.8, this study hypothesized that:

H_9: *There is a significant relationship between loan to deposit ratio and NPL of conventional banks in Pakistan.*

3.5.2.3 Profitability [Return on Assets (ROA)]

Many of the studies has reported that high performance reduces the risk taking. (Boudriga, Boulila, et al., 2009; Boudriga et al., 2008, 2010; Chaibi & Ftiti, 2015; Cotugno et al., 2010; Erdinç & Abazi, 2014; Godlewski, 2005; Louhichi & Boujelbene, 2016; Louzis et al., 2012; Makri et al., 2014; B. Mehmood et al., 2013; Messai & Jouini, 2013; Shingjergji, 2013; Swamy, 2012; Tehulu & Olana, 2014; Vithessonthi, 2016; Zribi & Boujelbène, 2011). On the other hand, insignificant relationship of performance on risk taking and NPL has been reported by previous studies (Boudriga, Boulila, *et al.*, 2009; Ganić, 2014; Jakubík & Reininger, 2014; Vithessonthi, 2016). Based on the inconsistent results and other results of the studies presented in Table 2.9, this study hypothesized that;

H_{10}: *Return on Assets of banks significantly affects the NPL of conventional banks in Pakistan.*

3.5.3 Moderating Variable

Moderating variable that was chosen for this study is institutional investors as explained in section 2.5 in chapter2.

3.5.3.1 Institutional Investors

Institutional investors measure how efficient the resources of a bank is utilized in generating revenues by using all available resources, skills and experience. In other words, for every 1% change in institutional investors, how much variance will be contributed to the bank in the form of profits and NPL? In a bank, efficiency, profitability and NPL are mainly controlled by management. The Modern Portfolio

Theory suggests diversified portfolios for maximum returns given the external and internal factors that can affect the returns.

In banking, when institutional investors invest, they follow the same investment strategy in achieving maximum profits from banking business which is mainly lending. Thus, institutional investors may influence the management and prefer risky strategies because their investment is mostly diversified (J. Lim *et al.*, 2014; Saghi-Zedek, 2016). Institutional investors are more concerned with their financial gains and their overall portfolio is not concentrated. Thus, their interest may vary depending on their portfolio preference. According to Lamy (2011), due to preference of institutional investors for high risk taking, liquidity is lower in the banks engaging all funds towards projects that carry positive net values.

Institutional investors in the company (bank in this case) increases shareholders value by decreasing agency problems. Institutional investors have incentives to improve performance and could punish those managers that did not move along their benefits and their benefits are mostly the benefits of the shareholders and it will give rise to profits and returns, thus reducing loan losses in the form of NPL. The risk taking by banks increases as the level of institutional ownership increases with low CAR (Rahman *et al.*, 2012). Further, institutional investor prefer higher risk based on their short term profit objectives (Ashraf et al., 2016; T. A. Barry et al., 2011; Berger et al., 2005; Chou & Lin, 2011; Hossain et al., 2013).

However, institutional investor may moderate the relationship between CAR and NPL in that risk taking by banks increases as the level of institutional ownership increases

with low CAR (Rahman *et al.*, 2012). Further, institutional investor prefer higher risk based on their short term profit objectives (Ashraf et al., 2016; T. A. Barry et al., 2011; Berger et al., 2005; Chou & Lin, 2011; Hossain et al., 2013). Moreover, presence of institutional investors may moderate the relationship between ROA and NPL in that institutional investor prefer riskiest strategies (T. A. Barry et al., 2011). Likewise, other studies has reported that institutional investors may influence the management and prefer risky strategies because their investment is mostly diversified (J. Lim *et al.*, 2014; Saghi-Zedek, 2016). It indicates that presence of institutional investor may moderate the impact of performance on the NPL.

Thus, this study examines the moderate effect of institutional investors on the relationship between internal factors and NPL as discussed above. Institutional Investors is postulate as moderating variable due to the fact that optimum utilization of available resources through better supervision of owners aligns the interests of owners and management and it will have greater potential for better efficiency and greater performance. In other words, efficient management has the potential to reduce NPL. Based on the above discussion, it is hypothesized that:

H_{11}: *The influence of capital adequacy ratio (CAR) on nonperforming loans (NPL) is moderated by institutional investors (II).*

H_{12}: *The influence of loan to deposit ratio (LTD) on nonperforming loans (NPL) is moderated by institutional investors (II).*

H_{13}: *The influence of return on assets ratio (ROA) on nonperforming loans (NPL) is moderated by institutional investors (II).*

3.6 Panel Regression Models

According to Creswell (2012), the best way to describe the relationships between independent variables and dependent variable is to form the research equation that based on regression statistical techniques. The research equation represents the research framework. In this study, multiple regressions describe the relation between one dependent variable and a number of independent variables and a moderating variable. The coefficient of the individual independent variable is used to predict tendency of each independent variable. The sign that indicate either positive or negative relationship is presented in both magnitude and direction. A coefficient value that close to zero is signifies a little effect on NPL.

3.6.1 Multiple Regression Models

The equations of regression before the inclusion of the moderating variable (II) are as:

(i) Pooled Factors

$$\boldsymbol{NPL}_{\mathbf{it}} = \boldsymbol{\alpha}_{\mathbf{0}} + \boldsymbol{\beta}_{\mathbf{1}}\mathbf{GDP}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{2}}\boldsymbol{LIR}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{3}}\boldsymbol{UR}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{4}}\boldsymbol{BCPS}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{5}}\boldsymbol{LNEG}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{6}}\boldsymbol{PSI}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{7}}\boldsymbol{CCI}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{8}}\mathbf{CAR}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{9}}\mathbf{LTD}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{10}}\mathbf{ROA}_{\mathbf{it}} + \boldsymbol{\varepsilon}_{\mathbf{it}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{3.5})$$

(ii) External Factors

$$\boldsymbol{NPL}_{\mathbf{it}} = \boldsymbol{\alpha}_{\mathbf{0}} + \boldsymbol{\beta}_{\mathbf{1}}\mathbf{GDP}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{2}}\boldsymbol{LIR}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{3}}\boldsymbol{UR}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{4}}\boldsymbol{BCPS}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{5}}\boldsymbol{LNEG}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{6}}\boldsymbol{PSI}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{7}}\boldsymbol{CCI}_{\mathbf{it}} + +\boldsymbol{\varepsilon}_{\mathbf{it}} \ldots\ldots\ldots (\mathbf{3.6})$$

(iii) Internal Factors

$$\boldsymbol{NPL}_{\mathbf{it}} = \boldsymbol{\alpha}_{\mathbf{0}} + \boldsymbol{\beta}_{\mathbf{1}}\mathbf{CAR}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{2}}\boldsymbol{LTD}_{\mathbf{it}} + \boldsymbol{\beta}_{\mathbf{3}}\boldsymbol{ROA}_{\mathbf{it}} + \boldsymbol{\varepsilon}_{\mathbf{i}} \ldots\ldots\ldots\ldots\ldots (\mathbf{3.7})$$

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Where,	α_0	=	constant
	i	=	bank
	t	=	time period
	ε_{it}	=	Error term of bank i on time t

Dependent variable: NPL = Non-Performing Loans

Independent variables:

GDP	=	gross domestic products	PSI	=	political stability index
LIR	=	lending interest rate	CCI	=	corruption control index
UR	=	unemployment rate	CAR	=	capital adequacy ratio
BCPS	=	bank credit to private sector	LTD	=	loan to deposit ratio
EG	=	energy gap	ROA	=	return on assets

For a given value of an independent variable, the coefficient β allows the prediction of the resulting change in NPL. The independent variables that explained the amount of variation is called the coefficient of determinants or adjusted R square (Adjusted R^2). This explains the percentage of variance explained by the independent variables.

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3.6.2 Hierarchical Moderated Regression Model

The regression equations for this study include the moderating variable (II) as it interacts with the internal variables in the equation. The subsequent models explain how the regression model integrated from multiple to hierarchical with the inclusion of moderating variable. Hair, Anderson, Tatham and Black (2010) model the moderated relationship as follows:

$$\boldsymbol{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2} \ldots\ldots\ldots\ldots\ldots (\mathbf{3.8})$$

Where:	$\boldsymbol{\beta_0}$	=	Intercept
	$\boldsymbol{\beta_1 X_1}$	=	Linear effect of X_1
	$\boldsymbol{\beta_2 X_2}$	=	Linear effect of X_2
	$\boldsymbol{\beta_3 X_1 X_2}$	=	Moderating effect of X_2on X_1

There are three interaction equations with moderating variable in each which are:

$$\boldsymbol{NPL}_{\mathrm{it}} = \boldsymbol{\beta_0} + \boldsymbol{\beta}_1\mathrm{CAR}_{\mathrm{it}} + \boldsymbol{\beta_2 LTD}_{\mathrm{it}} + \boldsymbol{\beta_3 ROA}_{\mathrm{it}} + \boldsymbol{\beta_4 II}_{\mathrm{it}} + \boldsymbol{\beta_5 CAR}_{\mathrm{it}} * \boldsymbol{II}_{\mathrm{it}} + \boldsymbol{\varepsilon}_{\mathrm{it}} \ldots\ldots\ldots (\mathbf{3.9})$$

$$\boldsymbol{NPL}_{\mathrm{it}} = \boldsymbol{\beta_0} + \boldsymbol{\beta}_1\mathrm{CAR}_{\mathrm{it}} + \boldsymbol{\beta_2 LTD}_{\mathrm{it}} + \boldsymbol{\beta_3 ROA}_{\mathrm{it}} + \boldsymbol{\beta_4 II}_{\mathrm{it}} + \boldsymbol{\beta_5 LTD}_{\mathrm{it}} * \boldsymbol{II}_{\mathrm{it}} + \boldsymbol{\varepsilon}_{\mathrm{it}} \ldots\ldots\ldots(\mathbf{3.10})$$

$$\boldsymbol{NPL}_{\mathrm{it}} = \boldsymbol{\beta_0} + \boldsymbol{\beta}_1\mathrm{CAR}_{\mathrm{it}} + \boldsymbol{\beta_2 LTD}_{\mathrm{it}} + \boldsymbol{\beta_3 ROA}_{\mathrm{it}} + \boldsymbol{\beta_4 II}_{\mathrm{it}} + \boldsymbol{\beta_5 ROA}_{\mathrm{it}} * \boldsymbol{II}_{\mathrm{it}} + \boldsymbol{\varepsilon}_{\mathrm{it}} \ldots\ldots(\mathbf{3.11})$$

Where $\boldsymbol{\beta_0}$ = constant

i = bank

t = time period

ε_{it} = Error term of bank i on time t

and moderating variable is: II = institutional investors

In this model," institutional investors" is treated as a moderating variable because "institutional investors" is a controlling mechanism and it is related to the monitoring internal process and operation of banks. With the higher percentage of the institutional investors' share in ownership structure, the higher their monitoring the credit administration and internal control of a bank, the lower would be the NPL as found by Aremu, Suberu and Oke (2010).

3.6.3 Hierarchical Multiple Regression Test

Hierarchical multiple regression is typically used to test specific conceptually based hypotheses (B. H. Cohen, 2001). It involves hypothetically based decisions on how predictors are entered into the analysis. According to Petrocelli, Cohen and Wampold (2003), the change in predictability associated with predictor variables entered later in the analysis over and above that contributed by predictor variables entered earlier in the

analysis are focused in hierarchical multiple regression test. Furthermore, Pallant (2011) described that in hierarchical regression, the independent variables are entered into equation in the order specified by the researcher based on conceptual grounds. The following is the model of moderating variable effects:

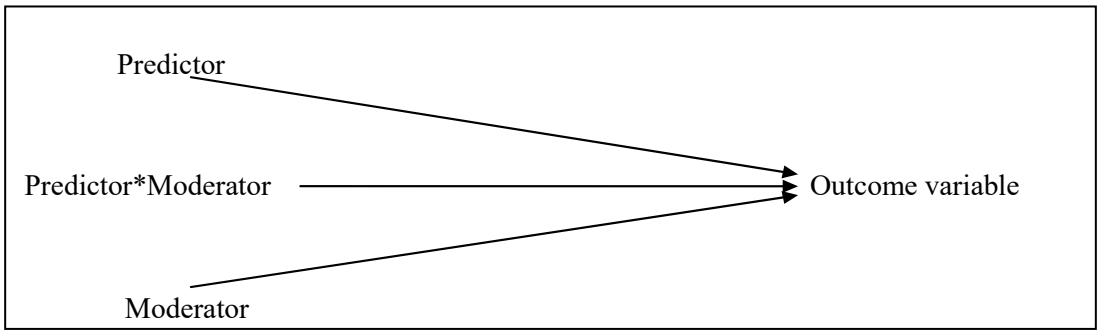

Figure 3.3
The Moderating Effect Model
Source: Baron and Kenny (1986)

Baron and Kenny (1986) described that the moderating model consists of three causal paths that provide for the outcome variable as in Figure 3.3. The impact of predictor is path a, while the impact of moderator is path b, paths c is the interaction between predictor (path a) and moderator (path b). The sets of variables are entered in steps with each independent variable being assessed in terms of what it adds to the prediction of the dependent variable, after the previous variables have been controlled for. The hierarchical multiple regressions are testing the equation as written in Section 3.6.2.

3.7 Data Collection Procedures

The procedure of sample selection and data collection for this study is discussed in this section in detail. The details are offered in subsections 3.7.1 and 3.7.2.

3.7.1 Data Sources

The study used data from secondary sources. This data has used analyzing the external variables over the period of (2006 – 2017) were obtained from Pakistan Economic Survey, World Bank and International Monetary Fund (IMF). Meanwhile, for internal and moderating factors of this study, data which comprise of financial ratios were obtained from annual reports of Pakistani Banks published in SBP over the period of (2006 – 2017). It is selected as important events happened in financial market which in some way either influenced the banks' NPL. The sources of data collection for each variable are presented in Appendix B.

3.7.2 Sample Selection and Unit of Analysis

The population consists of all Pakistani conventional banks. The list of banks was obtained from Financial Stability Review (State Bank of Pakistan, 2016). There are 28 conventional banks in total operating in 2017 in Pakistan while 11 of them started operation from 2006 to 2017. All conventional banks are taken in the population of this study using unbalanced panel data. This study utilizes the listed banks as the unit of analysis. There are multiple benefits of choosing listed banks compared to the non-listed banks. First, accounts of listed banks are audited by an external auditor that increases the reliability of the data. Second, the publishing audited financial statements is compulsory for listed banks, and this results in the uniformity of the financial statement data, hence making comparison easy with the previous Pakistani studies with almost similar samples. Third, listed banks have multiple stakeholders compared to non-listed banks where for example, minority shareholders, controlling shareholders, employees, creditors and state agencies are stakeholders. The list of selected 20 banks are given in appendix C.

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The nature of the data for this study is secondary data and it was obtained from individual bank's annual report of Pakistan published by SBP. The financial data covered the year ended 2006 until 2017. The data for GDP, lending interest rate, unemployment rate, and bank credit to private sector was extracted from the Economic Survey of Pakistan reported by Ministry of Finance. The data for energy gap is taken from National Transmission & Dispatch Company (NTDC), a subsidiary of Water & Power Development Authority (WAPDA) Pakistan. The indices of political stability and corruption control index were taken from World Governance Indicator Reports (Wgidataset.com). The reason for using data from the annual reports for this are; (1) they are consistent with the previous studies; (2) annual reports are the regulated and audited documents which are accessible to the researcher; (3) as major sources of information about the banks' performance, profitability and financial condition; and (4) the data is reliable and presented in the standard format across banks in all the countries selected. The use of annual reports was supported by Agusman, Monroe, Gasbarro and Zumwalt (2008) who suggested that to assess the performance of the bank, accounting reports are essential and widely used.

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3.8 Data Analysis

The data analysis technique is selected carefully. Data outliers are checked followed by tests to check the assumptions of linear regression model that includes normality, multicollinearity tests. Others diagnostic tests that are carried on are autocorrelation and heteroskedasticity. For selection of analysis technique, Lagrangian Multiplier and Hausman Specification tests are used amongst the pooled OLS, Random Effects and Fixed Effects methods. But the groupwise heteroskedasticity test and cross-sectional dependence tests results maintained that Panel Corrected Standards Errors (PCSE)

estimator is the most suitable technique considering the nature of the panel data of this study. PCSE is also called Prais-Winston Regression technique and thus, this is used to test the selected variables in the research framework. The discussion about all diagnostic tests and the way it is selected are given at length in chapter 4. The data analysis software used in this research is STATA 14.

3.9 Summary of the Chapter

This chapter discusses the research design, hypothesis development, data collection and data analysis technique. The study used data taken from audited financial reports of the banks which are published every year. The study period duration is 12 years from 2006 to 2017. The independent variables consist of seven external factors (GDP, LIR, UR, BCPS, PSI & CCI) and three internal factors (CAR, LTD & ROA) while moderating factor comprises one variable (II). The dependent variable is NPL. Ten (10) hypotheses are developed and investigated for the selected determinants of NPL to answer research questions One (1) and Two (2). Another three (3) hypotheses were developed and investigated the moderating effects between internal factors and NPL for research objective Three (3). The method used is Panel Corrected Standard Errors (PCSE) estimator also called Prais-Winston regression model.

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CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses the results of this study. The descriptive statistics of the studied variables were discussed in Section 4.1. It followed by assumptions of linear regression model with normality check and analyses of multicollinearity in Section 4.2 and 4.3. LM test and Hausman tests were run under "Criterion for selection of Method of Analysis" followed by diagnostic tests in Sections 4.4 to 4.5 which include autocorrelation, heteroskedasticity, groupwise heteroskedasticity and cross-sectional dependence tests. Panel data analysis for pooled model were carried out after discussion on selection of estimator in Section 4.6 to 4.11. Subsequently, the discussion on results of multiple regression test of the direct relationship between nonperforming loans and the external and internal variables are presented and discussed in Section 4.12 to 4.14 respectively. The results and discussion of institutional investors moderating effects on the relationships between bank-specific factors and nonperforming loans were presented in the succeeding sections 4.15 to 4.16 followed by summary of results and its discussion in Section 4.17 and Section 4.18.

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4.2 Descriptive Statistics of Variables

Descriptive statistics tells about the basic features of the data in this study. The purpose of these statistics is just to provide a summary of the data set and not to test the hypotheses. Table 4.1 presents the descriptive result of the variables for Pakistani conventional banks used in this study. Table 4.1 shows the descriptive statistics of the dependent variables and the independent variables of Pakistani conventional banks used

in this study. The dependent variable is NPL, the independent variables are GDP, LIR, lagUR, BCPS, lnEG, CCI, PSI, CAR, LTD, and ROA. Moderating variable for this study is II. While lnSize and lnLLP are the control variables.

Table 4.1
Descriptive Statistics-all Variables for Conventional Banks in Pakistan

Variable	Mean	Median	Standard Deviation
NPL	11.4633	9.96	8.508322
GDP	3.69217	3.84	1.552084
LIR	10.8855	10.5133	2.439585
lagUR	5.7906	5.9	0.3343134
BCPS	20.0601	16.97	4.829847
lnEG	7.29899	7.87398	1.953482
PSI	1.39371	1.4218	0.8430843
CCI	18.409	19.2308	3.119754
CAR	17.0301	14.3	10.46065
LTD	62.3983	63.57	14.94522
ROA	0.72655	0.98	1.685113
II	74.9954	82.1	23.13811
lnSize	19.2272	19.4535	1.330422
lnLLP	15.686	16.1297	1.764843

Note: N=235. NPL is nonperforming loans ratio; GDP is annual growth rate of gross domestic product; LIR is average annual lending interest rate offered by banks to borrowers; lagUR is annual unemployment rate with 1-year lag; BCPS measures the bank credit to private sector as percentage of GDP; lnEG measures the difference of electricity demanded and supplied, this is represented in natural logarithm value; CCI is the corruption control index calculated and published by World bank in World Governance Indicators (WGI) and it represents corruption in an economy; PSI is the political stability index calculated and published by World bank in World Governance Indicators (WGI) and it represents politically stability in an economy; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; lnSize is logarithm of total assets and represents size of the bank and lnLLP represents loan loss provisions. lnSize and lnLLP are control variables.

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The result indicated that the mean for NPL for 235 observations of Pakistani banks over the study period is 11.4633 which indicate that conventional banks in Pakistan experienced a very high nonperforming loans during the period of study. The standard deviation of 8.5083 also shows that the level of nonperforming loans in conventional banks of Pakistan varied highly between individual banks. These statistics substantiate that the problem of nonperforming loans in Pakistani banks persistently exist and may convert into a banking and economic crisis in near future. Because , high NPL lead to an episode of distress to be classified as a full-fledged crisis is when the ratio of NPL in the banking system exceeds 10% (Demirgüç-Kunt & Detragiache, 1998). It also validates the situation discussed in the background is continued and even worsening over time.

Table 4.1 explains the nature of external and internal factors considered in the study and confirms the situation of these factors as discussed in the background of the study. For example, the mean value for GDP is 3.6922 which indicate that during the study period, GDP for Pakistan experienced very low growth of 3.7% with a little variation of 1.5521 during the period of study.

Also, the mean value for LIR is 10.8855 which is the higher mean and it implies that the conventional banks in Pakistan used to charge higher lending interest rate 10.89% to borrowers to disburse new loans during the study period with a smaller value of standard deviation of 2.4396. The mean value for lagUR (unemployment rate with 1-year lag) is 5.7906 which indicates that the unemployment rate is also reasonably high at 5.8% with a very little variation of 0.3343 showing little improvement in employment rate during study period in Pakistani economy. Meanwhile, the mean value for BCPS

is 20.0601 which indicates that credit to private sector by banks remained quite low in Pakistan with very little change of 4.83% during the study period. The mean value for lnEG (natural logarithm of energy gap between demand and supply of electricity) is 7.299; this indicates that there is a big gap in electricity demand and supply with small change over the study period which is 1.95. This represents that there was huge gap in energy supply and demand during 2006 to 2017. The mean value of PSI during the study period was 1.3937 which shows the political stability was very low with negligible improvements in it at a standard deviation of 0.84308 in Pakistan during the study period. The mean value for CCI remained very high at a value of 18.4090 that represents the level of corruption in Pakistani economy while the standard deviation value was at 3.1198. Bank size and the level of loan loss provisions are control variable and their means values were 19.2272 and 15.68601 respectively.

Among the bank-specific variables, CAR has a mean value of 17.030 which is quite high with higher value of standard deviation i.e. 10.4607; it means that during the study period regulatory capital requirement was well maintained by all the banks on average but there was big variation among the bank and some banks might even slipped down the minimum regulatory threshold. The mean value of LTD was 62.3983 which is not very attractive with small value of standard deviation i.e. 14.95 It implies that loan disbursement remained low as compared to volume of deposits during the study period. The profits of Pakistani banks in conventional banking remained very low less than 1% as ROA with big variation in the form of standard deviation which was 1.67%; it implies that some banks might have reported loss during the period of study. The mean value of II was very high at almost 75% with a standard deviation of 23.14% which shows that institutional investors in Pakistani conventional banks is on average is at about 75%

and it varied from above 50% to above 90%. It also means that conventional banks institutional investors are contributing 75 paisa in every rupee of the banks' income during the study period.

4.3 Assumptions of Linear Regression Model

The assumptions of OLS are checked on all regression models those were run in this study. These assumptions are as follows:

4.3.1 Normality Test

Normality test ensures that the study data and variables of the study are distributed normally or not. Table 5.2 present Kolmogorov-Smirnov test and Shapiro-Wilk test results; these assess the normality distribution of the data used in the study. The result of the normality tests is as follows:

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Table 4.2
Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
NPL	0.117	235	0.000	0.870	235	0.000

NPL is nonperforming loans ratio.

Normality assumption is fulfilled when significant value is more than 0.05 (p-value>0.05, the result is insignificant, the distribution of the sample is normal; p-value<0.05, the result is significant, the distribution of the sample is not normal). In this case, the significant values are found to be less than 0.05, hence suggesting violation of normality assumptions for this sample.

As Kolmogorov-Smirnov test shows a non-normal distribution result, following (Joseph F. Hair, Money, Page, & Samouel, 2007) and (Tabachnick & Fidell, 2007), skewness and kurtosis tests are conducted to further check the normality of the data. Table 4.3 on next page presents the results of the skewness and kurtosis tests. The assumption of normality is confirmed by employing the Skewness (± 2.58) and Kurtosis (± 2.58). J. F Hair *et al.* (2010) suggested that critical value at ± 2.58 (0.01 significant level) and ±1.96 (0.05 significant level) are widely used in the studies. Table 4.3 presented Z-value of each of variables in this study it is found out that majority of the Z-values for skewness and kurtosis exceeded the specific critical value except for GDP and LTD. The results of the skewness and kurtosis test are consistent with the results of Kolmogorov- Smirnov test and Shapiro-Wilk test, thus, evidenced that the distributions of the data for Pakistani conventional banks are not normal.

As this study sample size is thought to be as large (N=235), the violation of normality assumption might not become a serious problem. Gujarati (2009) argues that the normality assumption in a large sample may be relaxed because it does not assume a critical role. Hair *et al.*, (2007), Pallant, (2011) and Tabachnick and Fidell (2007) opine that the violation of normality assumption should not cause any major problems in a large sample size. The reason that normality will not hamper most of the results in multiple regression analysis and thus the generalizability of the results is possible. Greene (2008), Pallant, (2011) and Hair *et al.*, (2007) described a sample size is large if its observations exceed 30 and Gujarati (2009) thought sample size to be large if the observations cross the figure of 100, while Tabachnick and Fidell (2007) relaxed large sample size cushion to have observations over 200. Thus, considering these defined

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large sample size, this study has 235 observations which are greater than 200 and could be relaxed.

Table 4.3
Skewness and Kurtosis Test

	Skewness			Kurtosis			Normal
Variables	Statistic	Std. Error	Z-value	Statistic	Std. Error	Z-value	
NPL	1.742	0.159	10.96	4.757	0.316	15.05	X
GDP	-0.246	0.159	-1.55	0.426	0.316	1.35	√
LIR	-0.281	0.159	-1.77	-1.11	0.316	-3.51	X
lagUR	-0.606	0.159	-3.81	-0.816	0.316	-2.58	X
BCPS	0.716	0.159	4.50	-1.117	0.316	-3.53	X
lnEG	-2.695	0.159	-16.95	5.899	0.316	18.67	X
PSI	1.25	0.159	7.86	0.531	0.316	1.68	X
CCI	-0.291	0.159	-1.83	-1.551	0.316	-4.91	X
CAR	2.181	0.159	13.72	5.553	0.316	17.57	X
LTD	0.008	0.159	0.05	-0.501	0.316	-1.59	√
ROA	-2.462	0.159	-15.48	8.91	0.316	28.20	X
II	-1.177	0.159	-7.40	0.414	0.316	1.31	X
lnSize	-0.588	0.159	-3.70	-0.194	0.316	-0.61	X
lnLLP	-1.277	0.159	-8.03	2.609	0.316	8.26	X

Note: Z-value (skewness) = skewness/std. error skewness; Z-value (kurtosis) = kurtosis/std. error kurtosis. X = not normal, √ = normal
NPL is nonperforming loans ratio; GDP is annual growth rate of gross domestic product; LIR is average annual lending interest rate offered by banks to borrowers; lagUR is annual unemployment rate with 1-year lag; BCPS measures the bank credit to private sector as percentage of GDP; lnEG measures the difference of electricity demanded and supplied, this is represented in natural logarithm value; CCI is the corruption control index calculated and published by World bank in World Governance Indicators (WGI) and it represents corruption in an economy; PSI is the political stability index calculated and published by World bank in World Governance Indicators (WGI) and it represents politically stability in an economy; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; lnSize is logarithm of total assets and represents size of the bank and lnLLP represents loan loss provisions. lnSize and lnLLP are control variables.

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This study sample size is yet more than 200 observation and thus, thought to be too large and could be relaxed against normality assumptions. Hence, GLS and not OLS could be used.

Since the data is not normally distributed, Generalized Least Square (GLS) method is initially selected to be used for the multiple regression analysis of the study. GLS is a transformed Ordinary Least Square (OLS) that satisfy the standard least squares assumptions (Gujarati, 2009). According to Gujarati and Porter (2010) and Wooldridge (2002), GLS method of estimation helps to address the issue of non-normality distribution of variables that due to the existence of heteroskedasticity. They further revealed that GLS estimation is used to correct the problems which are affecting our model such as heteroskedasticity and auto- correlation. Hence, the normality issue was addressed using GLS method.

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4.3.2 Multicollinearity Check

In this study, Variance Inflation Factor (VIF) tests the presence of multicollinearity among the independent variables (IVs) of any study. Hair *et al.* (2010) indicates the multicollinearity issue if VIF values are greater than 10 or tolerance values are smaller than 0.10. Meanwhile, Pallant (2011) proposed that VIF value more than 9.0 should be taken as a warning of multicollinearity issues and the correlation matrix should be examined. The result of the test is presented in the Table 4.4 on next page for Pakistani conventional banks.

Table 4.4
Multicollinearity Diagnostic Test

Variable	Tolerance Value	VIF
Annual Growth of Gross Domestic Product	0.268865	3.72
Lending Interest Rate	0.157715	6.34
Annual Unemployment Rate with1-year lag	0.254486	3.93
Bank Credit to Private Sector	0.318403	3.14
Natural Logarithm of Energy Gap	0.550401	1.82
Corruption Control Index	0.14677	6.81
Political Stability Index	0.338042	2.96
Capital Adequacy Ratio	0.618175	1.62
Loan-to-Deposit Ratio	0.618358	1.62
Return on Assets	0.530847	1.88
Institutional Investors' Share in Ownership	0.769976	1.30
Bank Size	0.161391	6.2
Loan Loss Provisions	0.242983	4.12

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The existence of problem of multicollinearity could not be verified when referred to Table 4.4, as the variables have VIF less than 9.0. The highest VIF among the variables is CCI which is 6.81. moreover, Pallant (2011) recommended that the presence of multicollinearity problem should be checked by correlation matrix and the correlation matrix of conventional banks in Pakistan is presented in the Table 4.6 on Page 124. While Table 4.7 on page 125 is related to the internal factors model discussed in the Section 4.7 on page 157 where interaction models are also discussed.

Table 4.5
Multicollinearity Diagnostic Test for Models 1- Model 5

Variable	Tolerance Value	VIF
CAR	0.241233	4.15
LTD	0.793400	1.26
ROA	0.763887	1.31
II	0.370358	2.70
CAR * II	0.287542	3.48
LTD * II	0.727561	1.37
ROA * II	0.575039	1.74

NPL is nonperforming loans ratio; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; CAR*II is interaction term of capital adequacy ratio with institutional investors; LTD*II is interaction term of loan-to-deposit ratio with institutional investors and ROA*II is interaction term of return on asset with institutional investors.

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The correlation analysis is used to identify the existence of multicollinearity among independent variables, which may affect their relationship with the dependent variables in the regression analysis (Pallant, 2011). Based on the correlation matrix shown in Table 4.6 on next page, the highest correlation coefficient is between lagUR and BCPS, which is 0.873. However, this value is below 0.90, the benchmark to identify multicollinearity (Pallant, 2011). Hence, no evidence for the presence of multicollinearity problem found among the independent variables of the model.

Table 4.7 is related to the internal factors model discussed in the Section 4.7 on page 157where interaction models are also discussed.

Table 4.6
Pearson Correlation Matrix

	NPL	GDP	LIR	lnUR	BCPS	lnEG	CCI	PSI	CAR	LTD	ROA	II	lnSize	lnLLP
NPL	1													
GDP	-0.12700	1												
LIR	0.175**	-0.631**	1											
lnUR	0.195**	-0.03900	-0.05900	1										
BCPS	-0.11800	-0.195**	0.377**	-0.873**	1									
lnEG	0.07500	-0.294**	0.583**	-0.270**	0.351**	1								
CCI	-0.234**	0.576**	-0.718**	-0.431**	0.06800	-0.230**	1							
PSI	-0.11400	0.454**	-0.327**	-0.268**	-0.04700	0.01400	0.678**	1						
CAR	-0.08100	0.04900	-0.02600	-0.02700	0.00000	0.00900	0.03300	0.003	1					
LTD	0.09100	-0.231**	0.323**	-0.327**	0.446**	0.190**	-0.09300	-0.059	-0.244**	1				
ROA	-0.496**	0.222**	-0.11000	0.06300	-0.10400	0.00000	0.09300	0.071	-0.11700	-0.1350*	1			
II	0.196**	0.01200	-0.02800	-0.01000	0.00100	-0.03800	0.00900	0.002	0.290**	0.07700	-0.1520*	1		
lnSize	-0.1330*	0.09100	-0.250**	0.291**	-0.345**	-0.251**	0.05800	0.006	-0.483**	-0.185**	0.481**	-0.365**	1	
lnLLP	0.329**	-0.05700	-0.11300	0.285**	-0.297**	-0.171**	-0.04000	-0.037	-0.458**	0.00200	0.1280*	-0.200**	0.785**	1

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

Note: NPL is nonperforming loans ratio; GDP is annual growth rate of gross domestic product; LIR is average annual lending interest rate offered by banks to borrowers; lagUR is annual unemployment rate with 1-year lag; BCPS measures the bank credit to private sector as percentage of GDP; lnEG measures the difference of electricity demanded and supplied, this is represented in natural logarithm value; CCI is the corruption control index calculated and published by World bank in World Governance Indicators (WGI) and it represents corruption in an economy; PSI is the political stability index calculated and published by World bank in World Governance Indicators (WGI) and it represents politically stability in an economy; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; lnSize is logarithm of total assets and represents size of the bank and lnLLP represents loan loss provisions. lnSize and lnLLP are control variables.

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Table 4.7

Pearson Correlation Matrix for Interaction Models 1-5

	NPL	CAR	LTD	ROA	II	CAR*II	LTD*II	ROA*II
NPL	1							
CAR	-0.0808	1						
LTD	0.0909	-0.2444**	1					
ROA	-0.4964**	-0.1172	-0.1349*	1				
II	0.1965**	0.2898**	0.0774	-0.1515*	1			
CAR*II	-0.1228	0.7359**	-0.129*	-0.1141	-0.0875	1		
LTD*II	-0.0185	-0.1134	0.1647*	-0.0222	-0.332**	-0.1685**	1	
ROA*II	-0.0713	-0.1355	-0.03	0.3157**	0.433**	-0.2027**	-0.2363**	1

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

NPL is nonperforming loans ratio; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; CAR*II is interaction term of capital adequacy ratio with institutional investors; LTD*II is interaction term of loan-to-deposit ratio with institutional investors and ROA*II is interaction term of return on asset with institutional investors.

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4.3.3 Criterion for Selection of Method of Analysis

Generally, in social sciences fields including finance and banking, it has become the norm to analyze large scale econometric datasets in panels. Because while comparing with purely cross-sectional data, panel has edge since it mostly contains more information than single cross-sections and thus it allows estimation with increased precision. Thus, this study adopted the panel estimation approach to investigate the impact of critical external and internal factors on the nonperforming loans of conventional banks in Pakistan; testing the moderating effect of the most promising ownership structure i.e., institutional investors on selected bank-specific factors over the period of twelve years (2006-2017). There are many advantages in using panel data over the cross-sectional data. The panel data have more variability and less collinearity among its variables when compared with cross-sectional data (Baltagi, 2013). However, panel data raises concerns regarding the ability to control unit heterogeneity by the researchers (Baltagi, 2013). Unit heterogeneity refers to the fact that not all units in a sample are equal. Consistent with this perspective, modelling firm (in this case bank) heterogeneity allows researchers to relax the constraint that all firms in a sample are equal. In case of Pakistani conventional banks, every bank is different from other banks.

Moreover, the Panel data method considers individuality of every company (in this case every bank) and enables computation of intercept distinct for every firm (in this case every bank) using pooled OLS regression model, fixed effect or random effect model (Gujarati, 2004). The major problem with the pooled OLS regression model is that it does not distinguish between the samples (Hsiao, 2014). In another word, the pooled model cannot recognize the heterogeneity or individuality that may exist among

samples. Therefore, as suggested by Baltagi (2006), the first question arises with the application of panel data is that, whether to pool the data or not.

4.3.4 Lagrangian Multiplier Test

Lagrange multiplier (LM) test given by the Breusch and Pagan (1980) to determine whether the pooling of data is appropriate or not. The null hypotheses of the Lagrange multiplier (LM) test states that the variance of random effects is equal to zero. If this is the case, then pooled OLS is appropriate, otherwise alternative hypothesis is accepted (i.e. random effect model). This study carried out the LM Test to check the same and results are shown in Table 4.8 below:

Table 4.8
Breusch-Pagan Lagrangian Multiplier Test for Random Effects VS Pool Effect

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Chi^2	81.06	171.93	131.24	127.33	131.96	127.02
p-value	0.00	0.00	0.00	0.00	0.00	0.00

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The results show the Chi^2 values are 81.06 for the pooled model and 171.93, 131.24, 127.33, 131.96 and 127.02 for model 1 to model 5 while the p-values for all the models of this study are less than 1% (p-vale<0.01). If p-value<0.05 then the null hypothesis is rejected. The rejection of these null hypotheses specifies that the variance of random effects is not equal to zero, the random effects model is appropriate for all models. Random effects model selection implies that the variance of the omitted variables in the model is not equal to zero or the variability of data is not uniform within banks while Fixed effects model selection implies that variance of the omitted variables in the

model is equal to zero or the variability of the data is uniform within banks. Next, Hausman specification test is run to check the nature of the banks data for each of the models specified.

4.3.5 Hausman Specification Test

After meeting the validity assumption for the random effects model (REM), the next test is to check which model is better either in fixed effects (FEM) or random effects (REM). This decision is based on the Hausman specification test (Baltagi, 2013; Greene, 2008; Gujarati, 2004; Hausman, 1978), this answers on which model is appropriate. Hence, the Hausman test compares the coefficient of the FEM and the REM (Baltagi, 2013; Gujarati, 2004). The test null hypothesis assumes that the difference between the coefficients of the REM and FEM is not systematic. The acceptance of the null hypothesis results in the selection of the REM. Based on the actual results provided in Table 4.9, the value of chi^2 statistics is 3.87 for pooled model and 7.48, 10.04, 19.30, 17.08 and 15.03 for

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Table 4.9
Hausman Specification Test for Random Effect VS Fixed Effect

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Chi^2	3.87	7.48	10.04	19.30	17.08	15.03
p-Value	0.9925	0.0582	0.0397	0.0017	0.0044	0.0102

model 1 to model 5 while a p-value > 0.01 for pooled model, model 1 and model 2, the insignificant p-value shows that difference between the coefficients of the REM and FEM is not systematic. Thus, the null hypothesis could not be rejected in these models. Therefore, the REM is appropriate to perform multiple regression analysis for these

models according to this test. While the p-value<0.01 for model 3, model 4 and model 5 shows the significant p-value which means that difference between the coefficients of the REM and FEM is systematic. Therefore, the null hypothesis could not be accepted and alternate hypotheses are selected. Therefore, the fixed effect model is appropriate to perform multiple regression analysis for these models according to this test.

After the selection of the random effect model in pooled and only internal factors models which implies that the variability in Pakistani bank data for internal factors and both external and internal factors is time variant. The selection of fixed effect models for internal factors model with inclusion of institutional investors (moderator) and moderation models over internal factors implies that there is no variability in banks data. Next, it is important to understand that panel data often violates the assumption of spherical error terms. Specifically, error terms are considered spherical when they have the same variance (homoscedasticity) and are not correlated with one another. The assumption regarding correlation refers to the fact that errors across units at one point in time are uncorrelated (lack of cross-sectional dependence) and that errors of a particular unit are uncorrelated across time (lack of serial correlation). Irrespective of the benefits driven from panel data estimation, it also creates significant statistical problems for ordinary least squares (OLS) regression. Furthermore, panel data may generate analytic issues in the form of error terms containing heteroskedasticity, serial correlation and cross-sectional dependence; the presence of such conditions creates non-spherical error terms (Certo & Semadeni, 2006). While these problems are existent and not rectified, the analysis of panel data may result in incorrect analytic results (Certo & Semadeni, 2006; Hoechle, 2007). Therefore, diagnostic tests are also

Universiti Utara Malaysia

performed to assess the presence of serial correlation, heteroskedasticity, cross-sectional dependence in the panel data set.

4.4 Diagnostic Tests

The diagnostic tests are also carried out for all the regression models which are pooled model, model1 to model 5. The diagnostic tests are presented as follows:

4.4.1 Autocorrelation

Autocorrelation is one of the analytic issues created in the form of error terms in panel data regression, the presence of such condition creates non spherical error terms. Serial correlation occurs when a variable measured at one point in time for a given unit correlates with that same unit's variable measured at a different point in time. For example, LIR value in 2006 could have correlation with LIR value in 2009. Similarly, other independent variables like GDP, EG, ROA or all independent variables could have correlation with their own values from one point in time to other point in time. There could be higher potential of serial correlation in macroeconomic variables in our models.

This thesis uses a sample of twelve years' data, the error terms from these regressions are expected to be correlated over time. Consequently, the serial correlation assumption may be violated. Wooldridge test for autocorrelation in panel data was used to detect serial or first-order autocorrelation AR (1). The Wooldridge test (Wooldridge, 2002) as suggested by Drukker (2003) is estimated to formally detect any serial correlation issues in the panel data in the residuals. The test is based on the null hypothesis that there is no first-order autocorrelation.

Table 4.10
Wooldridge Test for Serial Correlation in the Panel Data of all Models

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
F (1, 19)	81.364	122.436	130.509	130.336	167.336	129.646
Probability>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The Wooldridge statistics for the Pooled Model and Model 1, 2, 3, 4 and 5 are reported in Table 4.10, the value of chi^2 statistics is 81.364, 122.436, 130.509, 130.336, 167.336 and 129.646 and the p-value<0.01 for all models. If p-value<0.05, then the null hypothesis is rejected. Therefore, there is a significant presence of the serial correlation in all six models. So, these results imply that most of the independent variables in all models have autocorrelation issue. Maybe for macroeconomic variables like GDP, there could be inertia problem and the swing in the value of series sometimes goes up and sometimes goes down creating interdependence among its own values at different points in time. Therefore, to check real the impact of these variables on nonperforming loans, autocorrelation must be controlled.

Universiti Utara Malaysia

4.4.2 Heteroskedasticity

According to Cai and Hayes (2007), among the assumptions of the ordinary least squares regression (OLS) model, homoscedasticity is a rather stringent one that is unlikely to hold in many applied settings. Heteroskedasticity occurs when the variances of the error terms are not equal. For example, the variation in NPL due to CAR in bank 1 is not the same as in bank 2 or in bank 3. Similarly, it may be due to the way institutional investors treat the banks differently by providing funds that are not equal for each bank. This represents that the error term is not constant and data is

heteroskedastic. Especially, when applying the multiple regression analysis, heteroskedasticity is another major concern (J. F Hair *et al.*, 2010; Joseph F. Hair, Black, Babin, & Anderson, 2014), as the presence of heteroskedasticity can invalidate the efficiency of using the statistical results in panel data set, while biasedness in estimated standard errors may lead to invalid statistical inferences (Brooks, 2014).

For example, To detect heteroskedasticity, the formal statistical test Breusch-Pagan (Breusch & Pagan, 1980) is used. According to Brooks (2014) the null hypothesis of the Breusch-Pagan test is homoscedasticity; and if the null hypothesis is rejected, then it is a case of heteroskedasticity. If p-value<0.05, then the null hypothesis is rejected, therefore, it results in non-acceptance of the null hypothesis of homoscedasticity.

Table 4.11
Breusch-Pagan/ Cook-Weisberg Test for Heteroskedasticity in all Models

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Chi^2	22.36	15.97	18.34	16.50	18.13	18.90
p-Value	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000

From the Table 4.11 above, test reports the value of Chi^2 statistic is 22.36, 15.97, 18.34, 16.50, 18.13 and 18.90 and the corresponding p-value<.01 for all six models. Since there is a rejection of the null hypothesis in model 1, it indicates that there is a presence of material heteroskedasticity in the residuals from the regression in all the models.

Universiti Utara Malaysia

4.4.3 Groupwise Heteroskedasticity Tests

To further check the presence the heteroskedasticity in panel data with the random effect and fixed effect models selections, the groupwise heteroskedasticity tests as suggested by Greene (2008) are calculated. This is because both the random-effects and fixed effects regression model invokes the ordinary least squares (OLS) estimator for point and interval estimates under the classical assumptions that the error process is independently and identically distributed. In the pooled cross-section time-series context, these assumptions may be violated in several ways. The error process may be homoscedastic within cross-sectional units i.e. across banks the impact of say CAR on NPL is same, but its variance may differ across units i.e. it's impact is different over the years: a condition known as groupwise heteroskedasticity (Baum, 2001). According to Greene (2008) the null hypothesis is no groupwise heteroskedasticity; and if the null hypothesis is rejected, then it is a case of group wise heteroskedasticity.

Universiti Utara Malaysia

Table 4.12
Modified Wald Test for Groupwise Heteroskedasticity for all Models

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Chi^2	222000	21431.63	21838.59	45700.19	17947.46	14777.62
p-Value	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000

From Table 4.12, Modified Wald Test is run on all models and the test reports the Chi^2 statistic 222000, 21431.63, 21838.59, 45700.19, 17947.46 and 14777.62 respectively while the corresponding p- value<.01 for all six models in this test indicating that, if p-value<0.05, then null hypothesis of no groupwise heteroskedasticity is rejected for all six models. This shows the presence of groupwise heteroskedasticity in the selected

random effect models. Both Random Effects and Fixed Effects models cannot handle groupwise heteroskedasticity.

4.4.4 Cross-Sectional Dependence Tests

Empirical financial and banking studies frequently use data consisting of repeated time-series observations on both fixed and random cross-sectional units. While providing a rich amount of information, time-series-cross-sectional (TSCS) or panel data are likely to be characterized by complex error structures and produce non- spherical error term. Non-spherical error term generates in the data due to either heteroskedasticity or due to autocorrelation or due to both. Both of heteroskedasticity and autocorrelation are explained before with examples of data under study. The application of OLS to data with non-spherical errors produces inefficient coefficient estimates, and the corresponding standard error estimates are biased (Moundigbaye, Rea, & Reed, 2018; Reed & Webb, 2010). In the words of Cameron and Trivedi (2005, p. 702) "NT correlated observations have less information than NT independent observations". Therefore, erroneously ignoring possible correlation of regression disturbances over time and between subjects can lead to biased statistical inference if not rectified (Certo & Semadeni, 2006; Hoechle, 2007).

A growing body of the panel-data literature concludes that panel-data models are likely to exhibit substantial cross-sectional dependence in the errors as mentioned earlier due to heteroskedasticity and autocorrelation individually or combined, which may arise because of the presence of common shocks and unobserved components that ultimately become part of the error term, spatial dependence, and idiosyncratic pairwise dependence in the disturbances with no particular pattern of common components or

spatial dependence (Baltagi, 2013; Pesaran, 2004). One reason for this result may be that during the last few decades we have experienced an ever-increasing economic and financial integration of countries and financial entities, which implies strong interdependencies between cross-sectional units (De Hoyos & Sarafidis, 2006).

While the impact of cross-sectional dependence in estimation naturally depends on a variety of factors, such as the magnitude of the correlations across cross sections and the nature of cross-sectional dependence itself. If it is assumed that cross-sectional dependence is caused by the presence of common factors, which are unobserved (and the effect of these components is therefore felt through the disturbance term) but uncorrelated with the included regressors, the standard fixed-effects and random-effects estimators are consistent, although not efficient, and the estimated standard errors are biased (De Hoyos & Sarafidis, 2006). Although researchers have noted the threats of heteroskedasticity and autocorrelation as they pertain to panel data but the influence of contemporaneous correlation has not received as much attention (Certo & Semadeni, 2006; Greve & Goldeng, 2004; Hoechle, 2007; Petersen, 2009). Contemporaneous correlation exists when two time series variables correlate with each other at any same point in time. In data set of current study, for example, energy gap and GDP growth rate may have correlation at any same point in time as mentioned in the problem statement. Similarly, energy gap with other external factors may have correlation at any same point in time. Thus, there is clearly a need for testing for cross-sectional dependence in the panel data set of current study.

In order to test whether the residuals from a random effects estimation of regression models are spatially independent, De Hoyos & Sarafidis (2006) suggested Pesaran

Universiti Utara Malaysia

(2004) CD test and Frees (1995) test, when N>T, that is the case of the current study (235>12). The null hypothesis of the CD test states that the residuals are cross-

Table 4.13
Pesaran CD Test for Cross-Sectional Independence for all Models

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Pesaran's test statistics for cross-sectional independence	2.387	11.870	9.063	10.103	8.975	8.945
Average absolute value of the off-diagonal elements	0.397	0.455	0.432	0.424	0.432	0.439
Probability	0.0170	0.0000	0.0000	0.0000	0.0000	0.0000

Universiti Utara Malaysia

sectionally uncorrelated. Correspondingly, the test's alternative hypothesis presumes that spatial dependence is present. While Frees (1995) test provides the critical values for α=0.10, α=0.05, and α=0.01 from the Q distribution, if Frees statistic is greater than the critical value with at least α=0.01, it shows the presence of cross-sectional dependence in the data. The results of Pesaran (2004) CD tests are given in Table 4.13.

The value of Pesaran test is 2.387, 11.870, 9.063, 10.103, 8.975 and 8.945 respectively with the corresponding average absolute value of off-diagonal elements 0.397, 0.455, 0.432, 0.424, 0.432 and 0.439. The result of the CD test failed to accept the null hypothesis of no cross-sectional independence based on the corresponding significance of p-value<0.01 for all six models. The average absolute values of the off-diagonal

elements given before are very high values. Hence, there is enough evidence to suggest the presence of cross-sectional dependence in both random effects and fixed effects specification in all the models of the study. So, it means in data set CSD exists.

This result is further strengthened with Frees tests and its results are given in Table 4.12 below. Frees statistic for pooled model, and model 1 through model 5 are 5.052, 5.185, 4.079, 4.860, 4.075, and 4.211 respectively, which is larger than the critical value with at least α=0.01. Frees' test results also cannot accept the null hypothesis of cross-sectional independence. Frees test provides critical values for α=0.10, α=0.05, and α= 0.01 from the Q distribution. The results from both tests endorse the presence of significant cross-sectional dependence in the panel data set for this study.

Table 4.14
Frees Test for Cross-Sectional Independence for all Models

	Pooled Model	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Frees' test of cross-sectional independence	5.052	5.185	4.079	4.860	4.075	4.211
Critical values from Frees' Q distribution						
alpha = 0.10	0.3583	0.3583	0.3583	0.3583	0.3583	0.3583
alpha = 0.05	0.4923	0.4923	0.4923	0.4923	0.4923	0.4923
alpha = 0.01	0.7678	0.7678	0.7678	0.7678	0.7678	0.7678
Average absolute value [off-diagonal elements]	0.622	0.682	0.609	0.603	0.606	0.621

So cross-sectional dependence is confirmed. So, in such cases, when the underlying regression model's assumptions are violated as it can be seen in the current study, data is suffering from heteroskedasticity, autocorrelation and cross-sectional dependence due to the nature and behavior of Pakistani conventional banks. To ensure valid

statistical inference, it is common to rely on robust standard errors based on the alternative covariance matrix estimators as developed by Eicker (1967), Huber (1967) and White (1980). These alternative covariance matrices assume that the residuals are independently distributed, standard errors which are obtained by the aid of these estimators are consistent, even if the residuals are heteroskedastic. The generalized estimator produces consistent standard errors, if residuals are correlated within but uncorrelated between clusters. While all these techniques of estimating the covariance matrices are robust to certain violations of the regression model assumptions, they do not consider cross-sectional dependence (Hoechle, 2007). The random effects and fixed effects models cannot account for the disturbances due to cross-sectional dependence.

4.5 Panel Multiple Regression Analysis

To account for the influence of cross-sectional dependence, Parks (1967) have developed a technique known as Feasible Generalized Least Square (FGLS) based on an algorithm. Unfortunately, the Park's method is typically inappropriate for use with medium and large-scale micro-econometric panels due to at least two reasons. First, this method is not feasible if the T > N, this requirement is a necessary condition for the mathematical computations needed to model a contemporaneous correlation, secondly, Park's method tends to produce unacceptably small standard error estimates (N. Beck & Katz, 1995). It is believed that researchers should avoid FGLS when testing theory where N > T. It is important for researchers to understand that FGLS does not account for unit heterogeneity. The theoretical and empirical weaknesses underlying FGLS, then, raise some concerns with respect to the number of extant empirical studies relying on this estimator (Certo & Semadeni, 2006; Reed & Webb, 2010).

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Panel data are characterized by having repeated observations over time on some set of units, such as states, nations or firms like banks. Panel data have become common in applied studies in the social sciences including finance and banking research. Researchers analyze panel data sets whereby the number of units greatly exceeds the number of time periods (i.e., N > T), that is also the case of the current study. In other words, most researchers are not able to use estimators that explicitly model cross-sectional dependence. This inability to model explicitly cross-sectional dependence, though, does not propose that its threat goes away. However, the assumption regarding the disturbances of a panel model is cross-sectionally independent is often not appropriate. While it might be difficult to convincingly argue why country or state level data should be spatially uncorrelated, numerous studies on social learnings, herd behavior, and neighborhood effects clearly indicate that micro-econometric panel datasets are likely to exhibit complex patterns of mutual dependence between the cross-sectional units (e.g. individuals or firms) which are banks in the current study. Furthermore, because social norms and psychological behavior patterns typically enter panel regressions as unobservable common factors, complex forms of cross-sectional dependence may even arise when the cross-sectional units have been randomly and independently sampled (Certo & Semadeni, 2006; Reed & Webb, 2010). For example, maybe the inclusion of energy gap, corruption, political instability and institutional investors develop social norms and psychological behavior patterns issue in the panel regression as unobservable common factors that might raise the of CSD across the cross sections of the data set.

Panel data sets are popular in banking and financial studies because typically the data adhere to the assumptions needed to ensure that estimators such as OLS regression and

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analysis of variance will report efficient and unbiased results. One of the main assumptions in OLS regression is that the error terms have equal variances and are not correlated with one another (Baltagi, 2013; Greene, 2008). In other words, each error term is independent and identically distributed; such error terms are considered spherical. In contrast to cross-sectional data, panel data sets include measures of the dependent, independent, and control variables for each unit at multiple points in time. In this study, nonperforming loans is dependent variable while annual growth rate of gross domestic product, lending interest rate, annual unemployment rate, bank credit to private sector as percentage of gross domestic product, energy gap as the gap in annual supply and annual demand of electricity across the country, corruption control index in percentage, political instability index as percentage, capital adequacy ratio, loan-to-deposit ratio, return on asset ratio and institutional investors are independent variables and annual loan loss provisions and size of the individual bank are control variables for each of the bank in different years from 2006 to 2017.

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As noted by Greve and Goldeng (2004), researchers may rely on panel data to test static propositions, OLS regression is typically inappropriate for analyzing panel data sets, which include several observations per unit because cross-sectional dependence occurs when the residuals of units (cross-sections means banks in this case) observed at each period in time (i.e. annual observations from 2006 to 2017 in this case) are correlated (Certo & Semadeni, 2006). This correlation violates the assumption of spherical error terms and could influence the results of the OLS (Reed & Webb, 2010).

4.5.1 Rationale for Selection of Analysis Method

N. Beck and Katz (1995) suggested estimating linear models of panel data by ordinary least squares (OLS) and they proposed a sandwich type estimator of the covariance matrix of the estimated parameters, which they called panel-corrected standard errors (PCSE), that is robust to the possibility of non-spherical error structure also in the case when N>T. Interestingly, the PCSE does not require T to be considerably higher than N and it has been found to perform better than the FGLS (Bailey & Katz, 2011; Jonsson, 2005; Mellado & Saona, 2018). According to Reed and Webb (2010) and N. Beck and Katz (1995) correctly demonstrate that FGLS performs abysmally in many, if not most, "practical research situations." PCSE almost always provides improvement, often dramatic improvement, over FGLS when it comes to estimating standard errors.

4.5.2 Comparison of Competing Analysis Methods

N. Beck and Katz (1995) conclude that the PCSE estimator provides accurate standard error estimation with little loss in efficiency relative to FGLS (Parks), except in extreme cases of heteroskedasticity or cross-sectional correlation that are unlikely to be encountered in practice (N. Beck & Katz, 1995, p.645). Therefore, when fitting linear models to panel data, it is common to use this non-spherical error structure to improve inference and estimation efficiency by a Feasible Generalized Least Squares (FGLS) estimator suggested by Parks (1967). However, N. Beck and Katz (1995) showed that the model had poor finite sample properties. N. Beck and Katz (1995) use Monte Carlo methods to study the performance of FGLS in a statistical environment characterized by (i) group-wise heteroskedasticity, (ii) first-order serial correlation, and (iii) cross-sectional dependence. They dub the corresponding FGLS estimator by Parks (1967). N. Beck and Katz (1995) presented three major results:

Universiti Utara Malaysia

1 FGLS(Parks) produces dramatically inaccurate coefficient standard errors.

2 An alternative estimator, based on OLS but using "panel-corrected standard errors," (henceforth, PCSE) produces accurate coefficient standard errors.

3 The efficiency advantage of FGLS (Parks) over PCSE is at best slight, except in extreme cases of cross-sectional dependence, and then only when the number of time periods (T) is at least twice the number of cross-section units (N).

The PCSE has been employed in many of the recent studies (Hong Nhung Le, 2017; A. Mehmood, Hidthiir, & Nor, 2019; Mellado & Saona, 2018; Zheng, Sarker, & Nahar, 2017). Moreover, Moundigbaye *et al.*, (2018) strongly recommended that PCSE is the best estimator for hypothesis testing using cross-sectional time-series (panel) data in the presence of groupwise heteroskedasticity, autocorrelation, and cross-sectional dependence when T/N<1 and in this study T/N (12/20=0.6) < 1. Therefore, this study has adopted the PCSE approach to run multiple regression analysis to handle the problem of (i) group wise heteroskedasticity, (ii) first-order serial correlation, and (iii) cross-sectional dependence as mentioned above.

4.6 Selection of Panel Corrected Standard Errors (PCSE) Estimator for Regression Analysis, Results and Discussion

The Panel Corrected Standard Errors (PCSE) estimator used in regression analysis and performed using STATA 14 software to determine the projecting influence of independent variables annual growth rate of gross domestic product, lending interest rate, annual unemployment rate, bank credit to private sector as percentage of gross

domestic product, energy gap as the gap in annual supply and annual demand in electricity across the country, control of corruption index as percentage , political stability index as percentage, capital adequacy ratio, loan-to-deposit ratio, return on assets ratio, size of the individual banks and annual loan loss provision on dependent variable nonperforming loans. The result of Prais-Winston regression (PCSE) analysis for Pakistani conventional banks is presented in the Table 4.13 The beta coefficient value (β) shows the contribution of each independent variable to the dependent variable while the size of individual banks and annual loan loss provisions are included as control variables.

Universiti Utara Malaysia

Table 4.15
Panel corrected standard errors estimate for Pooled Model

Variable	Expected signs	Beta Coefficient	*t*-statistics	*p*-value
GDP	-	1.1855	5.22	0.000***
LIR	+	0.7533	5.08	0.000***
lagUR	+	-1.9853	-1.94	0.052*
BCPS	-	-0.1962	-2.47	0.014**
lnEG	+	0.2563	2.45	0.014**
PSI	-	-0.4594	-1.87	0.061*
CCI	-	-0.2387	-2.19	0.029**
CAR	-	-0.0861	-2.57	0.010***
LTD	-	-0.0881	-4.44	0.000***
ROA	-	-1.2238	-6.12	0.000***
lnSize		-3.9942	-6.5	0.000***
lnLLP		3.3604	7.21	0.000***
Constant		49.8770	4.07	0.000***
R^2	0.6406			
Wald χ2- Statistics	640.96			
Sig χ2- Statistics	0.0000			
Observations	235			

Note: *p<0.10, **p<0.05, ***p<0.01

Note: NPL is nonperforming loans ratio; GDP is annual growth rate of gross domestic product; LIR is average annual lending interest rate offered by banks to borrowers; lagUR is annual unemployment rate with 1-year lag; BCPS measures the bank credit to private sector as percentage of GDP; lnEG measures the difference of electricity demanded and supplied, this is represented in natural logarithm value; CCI is the corruption control index calculated and published by World bank in World Governance Indicators (WGI) and it represents corruption in an economy; PSI is the political stability index calculated and published by World bank in World Governance Indicators (WGI) and it represents politically stability in an economy; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; lnSize is logarithm of total assets and represents size of the bank and lnLLP represents loan loss provisions. lnSize and lnLLP are control variables.

Universiti Utara Malaysia

Based on the Table 4.13 results, the $\chi 2$-statistic that explains the overall significance of the model is found to be significant at 0.000 levels. The R-squared value of 0.6406 shows that regression model consisting of GDP, LIR, lagUR, BCPS, lnEG, CCI, PSI, CAR, LTD, ROA, lnSize, and lnLLP could explain 64.04% changes in NPL.

Further, the predictors from external variables, such as, gross domestic product (GDP), lending interest rate (LIR), unemployment rate with 1-year lag (lagUR), bank credit to private sector (BCPS), natural log of energy gap (lnEG), corruption control index (CCI), and political stability index (PSI) are significant. Meanwhile all predictors from internal variables are found to be significant that is, capital adequacy ratio (CAR), loan to deposit ratio (LTD), return on assets (ROA) and control variables which are bank size (lnSize) and loan loss provision (lnLLP); these all having statistically significant impact on nonperforming loans (NPL) of conventional banks in Pakistan and supporting all the hypotheses. No predictors in this model found to have insignificant impact on nonperforming loans (NPL) of conventional banks in Pakistan.

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In other words, the management of conventional banks in Pakistan is encouraged to consider the impacts of these variables since they contribute 64.06% of their banks' nonperforming loans, particularly CAR, LTD, and ROA (with control variables of lnSize and lnLLP), which have negative and significant (at 1%) impact on nonperforming loans indicate that the lending policies and risk management measure adopted by the Pakistani conventional banks and regulators over the 2006 to 2017 study period are effective in mitigating the nonperforming loans despite increases in their nonperforming loans.

4.6.1 Relationship between External Factors and Non-performing Loans in Conventional Banks of Pakistan.

While considering the external environment, independent variables GDP, LIR, and lnEG have positive impact on nonperforming loans at 1% and 5% significance level while independent variables lagUR, BCPS, CCI, and PSI have negative impact nonperforming loans at 1%, 5% and 10% significance level which implies that overall macroeconomic environment including some governance indicators are worsening the situation of nonperforming loans. The results of external variables and discussion on these results are as follows:

4.6.1.1 Gross Domestic Products (GDP)

The coefficient estimation of GDP is 1.1855 with t-value of 5.22 ($p < 0.01$). This result indicates that an increase of 1% in GDP, result in an increase of 1.1855% in nonperforming loans of conventional banks in Pakistan. The result shows that there is a positive and significant relationship between GDP and nonperforming loans, which appears to suggest that in good economic growth, there bound to be higher, nonperforming loans. The result supports the hypothesis H_1.

This result is consistent with the finding of Inekwe (2013) in Nigeria; whereby there is a significant and positive relationship between nonperforming loans and GDP. The Pakistani banks' result also supports Glen and Mondragón-Vélez (2011) and Nkusu (2011). These results appear to suggest that nonperforming loans increases during good economic conditions due to relaxation in credit policies and loose credit screening for approval by the banks. This happened as banks strived to achieve higher targets in returns.

4.6.1.2 Lending Interest Rate (LIR)

The coefficient estimation of lending interest rate is 0.7533 with t-value of 5.08 ($p < 0.01$). This result indicates that an increase of 1% in lending interest rate, results in an increase of 0.733% in nonperforming loans of conventional banks in Pakistan. The result shows that there is a positive and significant relationship between lending interest rate and nonperforming loans, which suggests that during the higher lending interest rate, nonperforming loans is higher. The result supports the hypothesis H_2.

The finding of the study is in line with international evidence by Beck *et al.*, (2015), Erdinç and Abazi (2014) and Muntean (2014) and also in Pakistani studies (Jameel, 2014; B. Mehmood et al., 2013; B. Mehmood, Mahmood, & Ahmed, 2014; Waqas et al., 2017; Zaib et al., 2014).

Theoretically, this is in alignment with the theory where higher lending interest rate would lead to the higher levels of NPL, implying that high interest rate increases the costs of funds by increasing debt servicing cost and it promotes the culture of high-risk behavior and loans are approved to high-risk borrowers at a very high interest rate. So, these loans most probably transformed into problem loans giving rise to non-performing loans.

4.6.1.3 Unemployment Rate (lagUR)

The coefficient estimation of unemployment rate with 1-year lag is -1.9853 with t-value of -1.94 ($p < 0.05$). This result indicates that a decrease of 1% in unemployment rate with 1-year lag, result in an increase of 1.9853% in nonperforming loans of conventional bank in Pakistan. The result shows that there is a negative and significant

relationship between unemployment rate and nonperforming loans, which appears to suggest that when unemployment rate is low, there bound to be higher nonperforming loans. The result supports the hypothesis H_3.

The result is in line with Zaib, Farid and Khan (2014) study in Pakistan. Unemployment rate being part of overall external environment correlates with debt service problems and translates into a portion of problem loans. But finding in this study shows that even at lower level of unemployment rate from the previous year (means annual employment rate with 1-year lag) did not reduce nonperforming loans rather add to the already piled up levels of nonperforming loans.

4.6.1.4 Bank Credit to Private Sector (BCPS)

The coefficient estimation of bank credit to the private sector as percentage of GDP is -0.1962 with t-value of -2.47 ($p < 0.05$). This result indicates that a decrease of 1% in bank credit to the private sector, result in an increase of 0.1962% in nonperforming loans of conventional bank in Pakistan. The result shows that there is a negative and significant relationship between bank credit to the private sector and nonperforming loans, which suggests that when bank credit to the private sector is low, it induces higher nonperforming loans. The result supports the hypothesis H_4.

The result is in line with studies (Amin et al., 2014; Das & Ghosh, 2007; Fofack, 2005; Klein, 2013; Nkusu, 2011). According to Nkusu (2011) increased burden of debt on debtors adds to the level of vulnerability through adverse shocks that influence either their wealth or income, thereby increasing the chance that they would be trapped into debt servicing while at the times of economic upturn, BCPS as proxy of indebtedness

is expected to impact contemporaneous NPL negatively. Amin *et al.*, (2014) concluded based on the results on their study that strong and consistent role of factors (relating to macro-level developments) helps to decrease level of NPL and causes increase in economic growth and financial development (proxy of BCPS).

4.6.1.5 Energy Gap (lnEG)

The coefficient estimation of energy gap is 0.2563 with t-value of 2.45 ($p < 0.05$). This result indicates that an increase of 1% in energy gap, result in an increase of 0.2563% in nonperforming loans of conventional banks in Pakistan. The result shows that there is a positive and significant relationship between energy gap and nonperforming loans, which suggests that when there is increase in energy gap, nonperforming loans is higher. The result supports the hypothesis H_5.

The result is in line with studies by Farhan, Sattar, Chaudhry and Khalil (2012) and Bhattarai (2014), though these studies concluded on the basis of bankers' perceptions. While this study results confirmed that energy has a significant role in determining the levels of nonperforming loans in conventional banks of Pakistan.

4.6.1.6 Political Stability Index (PSI)

The coefficient estimation of political stability index is -0.4594 with t-value of -1.87 ($p < 0.10$). This result indicates that a decrease of 1point ranking in political stability index, result in an increase of 0.4594% in nonperforming loans of conventional bank in Pakistan. The result is statistically significant, it shows that there is a negative relationship between political stability index and nonperforming loans, which reveals

that during instable political situation, nonperforming loans are higher. The result supports the hypothesis H_6.

The negative results of PSI on nonperforming loans shows that political stability has the ability to reduce nonperforming loans of conventional banks in Pakistan. The result however, was significant at 10%, as a predictor of nonperforming loans of conventional banks for Pakistan. It could be that during the study period of 2006 to 2017, Pakistan enjoyed relatively good political stability which enable good administration and governance be implemented to manage risks. Political stability was found significant in increasing investors' confidence to invest in a country. Wheeler and Mody (1992), Campos and Nugent (2002), and Aisen and Veiga (2006) found out that political stability is significantly related in determining investor to invest in such country and negative relationship between political stability and economic growth. On the other hand, political stability situation was found to disrupt economic growth (Aisen & Veiga, 2006; Drazen, 2000; Sturm & de Haan, 2005).

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4.6.1.7 Corruption Control Index (CCI)

The coefficient estimation of corruption control index is -0.2387 with t-value of -2.19 ($p < 0.05$). This result indicates that a decrease of 1point ranking in corruption control index, result in an increase of 0.2387% in nonperforming loans of conventional bank in Pakistan. The result shows that there is a negative and significant relationship between corruption control index and nonperforming loans, which appears to suggest that when there is high corruption or lower control index, it leads to higher nonperforming loans. The result supports the hypothesis H_7.

The result indicates that low corruption control index (indicating high corruption) would lead to higher nonperforming loans in the banks. According to Mauro (2002) that high corruption, has direct consequences on governance factors and economic growth and impede economic growth by discouraging investment, taxing and dampening entrepreneurship and further reduce public trust on the government institutions.

Erickson and Hills (2006) also found out that high corruption, discourage investment, increase cost, increase economic uncertainty. This affects the economic activities which lead to reduce public income and increase unemployment which lead to customers facing financial constraints and delay in their debt obligation to banks. If corruption takes place at bank level, there tend to be less governance as well as certain exemptions from the normal standard operating procedures in banking operations, credit assessment and approval process which leads to adverse selection of borrowers and potential high default rate or nonperforming loans.

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4.6.2 Relationship between Internal Factors and Non-Performing Loans in Pakistani Conventional Banks

The internal factors are the second group of independent variables and consists of three variables which are CAR, LTD and ROA and their related hypotheses. The results of these variables are discussed in the subsequent paragraphs.

4.6.2.1 Capital Adequacy Ratio (CAR)

The coefficient estimation of CAR is -0.0861 with t-value of -2.57 ($p < 0.01$). This result indicates that an increase of 1% in CAR, result in a decrease of 0.0861% in

nonperforming loans of conventional bank in Pakistan. The result is statistically significant, it shows that there is a negative relationship between CAR and nonperforming loans which indicates that when the CAR is low, it induces the nonperforming loans to be higher. The result supports the hypothesis H_8.

The result indicated that an increase in CAR lead to lower nonperforming loans of conventional banks in Pakistan. The result is in line with the studies (Boudriga, Boulila, *et al.*, 2009; M. Chen *et al.*, 2015; Erdinç & Abazi, 2014; Espinoza & Prasad, 2010; Jameel, 2014; Makri *et al.*, 2014; Meela & Prasad, 2016; Sinkey & Greenawalt, 1991; Zhang *et al.*, 2016). This study confirmed that the CAR is being utilized as a regulatory tool to reduce the levels of nonperforming loans in conventional banks in Pakistan.

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4.6.2.2 Loan to Deposit Ratio (LTD)

The coefficient estimation of loan to deposit ratio is -0.0881 with t-value of -4.44 ($p < 0.01$). This result indicates that an increase of 1% in loan to deposit ratio, result in a decrease of 0.0881% in nonperforming loans of conventional bank in Pakistan. The result is statistically significant, it shows that there is a negative relationship between loan to deposit ratio and nonperforming loans which reveals that there are higher nonperforming loans in tight liquidity situation when loan to deposit ratio is low. The result supports the hypothesis H_9.

The result is consistent with the study done by Durafe and Singh (2016); Cheng *et al.* (2016); Swamy (2015); and Abdullah *et al.* (2012). The LTD ratio, in Pakistan, decreases as deposits are increased and lending is decreased, it resulted in higher levels of the conventional bank's NPL in Pakistan. It also confirmed moral hazard hypothesis.

4.6.2.3 Return on Assets (ROA)

The coefficient estimation of profitability is -1.2238 with t-value of -6.12 ($p < 0.01$). This result indicates that an increase of 1% in ROA decrease of 1.2238% in nonperforming loans of conventional bank in Pakistan. The result is also statistically significant, it shows that there is a negative relationship between return on assets and nonperforming loans, which suggests that the higher the nonperforming loans when there the return on assets is lower. The result supports the hypothesis H_{10}.

There is a negative relationship between ROA and NPL of conventional banks in Pakistan at 1% significance level. The result indicated that increase in return on assets, decrease nonperforming loans of conventional banks in Pakistan. The result is consistent with the studies done by Louhichi and Boujelbene (2016), Vithessonthi (2016) Chaibi and Ftiti (2015), Tehulu and Olana (2014); Makri *et al.,* (2014), Erdinç and Abazi (2014) Messai and Jouini (2013), Shingjergji (2013), Mehmood, Irshad and Ahmed (2013), Swamy (2012), Zribi and Boujelbène (2011), Boudriga *et al.,* (2009), Boudriga *et al.,* (2008), Godlewski (2005) Boudriga *et al.,* (2010), Cotugno, Stefanelli, and Torluccio (2010), and Louzis *et al.,* (2012). They all found out that there is an inverse significant relationship between return on assets and nonperforming loans. The results signify bad management hypothesis.

4.6.3 Control Variables

Two control variables were used in the regression models, which are firm size and loan loss provisions of conventional banks.

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4.6.3.1 Bank size

Bank size is perceived to have a negative influence on nonperforming loans as it is believed that larger banks have better resources and capabilities to recover their loans. Larger firms are more likely to employ more skilled individuals and market power, and to use economies of scale (Adhikary, 2006). Further, larger banks have better image and reputation than smaller banks. This study uses bank size as a control variable which is a proxy of total assets. As conventional banks in Pakistan are of various sizes, this study controls the effects of size in order to analyze the relationship between the independent variables and the dependent variable. Bank size refers to total assets of bank i in year t and is measured as natural log of total assets. This proxy has been widely used by researchers such as Rahman *et al.*, (2012), Barry *et al.*, (2008), Lepetit, Nys, Rous and Tarazi, (2008), N. H. Ahmad (2003), Wiwattanakantang (2001), Rime (2001) and Gonzales-Hermosillo (1999) to control the effect of size on bank insolvency risk, and they have found bank size to be significant with insolvency risk.

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4.6.3.2 Loan Loss Provisions

Loan loss provisions is perceived to have a positive impact on nonperforming loans as it is believed that higher loan loss provisions decrease bank returns and equity which has negative influence on lending growth and it will increase the cost of risk taking (Simper, Hall, Liu, Zelenyuk, & Zhou, 2017a). Thus, this study uses loan loss provisions as a control variable which is a proxy of ex ante asset quality. The larger loan loss provision is required to cover higher non-performing loans (Azam Ali & Ghauri, 2013). As conventional banks in Pakistan are of various sizes and have different collateral requirements, this study controls the effects of asset and collateral quality to analyze the relationship between the independent variables and the dependent

variable. Loan loss provisions refer to ratio of total loan loss provisions to total assets of bank i in year t and is measured as natural log of this ratio. This proxy has been used as risk control variable by researchers such as (Altunbas, Gambacorta, & Marqués, 2007; Simper, Hall, Liu, Zelenyuk, & Zhou, 2017b).

4.6.4 The Summary of the Result of the Relationship between Independent Variables and Non-Performing Loans of Conventional Banks in Pakistan

To summarize the results regarding the hypotheses related to the predictive power of external variables and internal variables towards the nonperforming loans of conventional banks in Pakistan, it can be concluded that all the given hypotheses H_1, H_2, H_3, H_4, H_5, H_6, H_7, H_8, H_9, and H_{10} are significant. From Section 4.6.1, all seven (7) external variables are significant, while Section 4.6.2 shows all three (3) internal variables significantly influence nonperforming loans of conventional banks in Pakistan. The summarization of predictor coefficient test regression presented in the Table 4.14.

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Table 4.16

Summary of Multiple Regression (PCSE) Results of External and Internal Factors on Non-Performing Loans for Conventional Banks in Pakistan.

Independent Variables	Expected Sign	NPL
GDP	-	**Significant (+)**
LIR	+	**Significant (+)**
LagUR	-	**Significant (-)**
BCPS	-	**Significant (-)**
lnEG	+	**Significant (+)**
PSI	-	**Significant (-)**
CCI	-	**Significant (-)**
CAR	-	**Significant (-)**
LTD	-	**Significant (-)**
ROA	-	**Significant (-)**
lnSize (Control)		**Significant (-)**
lnLLP (Control)		**Significant (+)**

Note: GDP is annual growth rate of gross domestic product; LIR is average annual lending interest rate offered by banks to borrowers; lagUR is annual unemployment rate with 1-year lag; BCPS measures the bank credit to private sector as percentage of GDP; lnEG measures the difference of electricity demanded and supplied, this is represented in natural logarithm value; CCI is the corruption control index calculated and published by World bank in World Governance Indicators (WGI) and it represents corruption in an economy; PSI is the political stability index calculated and published by World bank in World Governance Indicators (WGI) and it represents politically stability in an economy; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; lnSize is logarithm of total assets and represents size of the bank and lnLLP represents loan loss provisions. lnSize and lnLLP are control variables.

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4.7 Discussion on the Effects of Institutional Investors on the Relationship between Internal Factors and Non-Performing Loans

As explained by Aiken and West (1991), interaction terms must be created in order to detect the moderating effect. Accordingly, the predictor variables were multiplied with the moderator variable to create the interaction terms. Three interactions were created: each independent variable was interacted with the moderator variable to create the new model for the moderating effect of institutional investor which is hypothesized to influence the direct relationship between CAR, loan to deposit ratio, return on assets and nonperforming loans.

Since the interaction terms raise concerns of multicollinearity problem between the interacted terms and the original components. To avoid this problem, the moderator and predictor variables were centered (Frazier, Tix, & Barron, 2004; Stephen G. West, Leona S. Aiken, & Jennifer L Krull, 1996). Centering also facilitates the interpretation of the interaction and predictors and helps to achieve accurate estimated coefficients (Frazier et al., 2004; Stephen G. West et al., 1996). After the creation of the interaction terms, everything should be in place to run the models.

Therefore, five regression models were run: first to check the direct relationship of internal variables (CAR, LTD, ROA) and nonperforming loan (NPL); second, to check these relationships of internal variables and dependent variable (DV)in the presence of institutional investors which is the moderating variable taken in this regression as an independent variable; third, the three regression models for each interaction to examine the moderating effect of institutional investors in the relationship between CAR, LTD, ROA and NPL.

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Table 4.17 on page 160 shows all the regression results including the results of the interaction terms of institutional investors with CAR, loan to deposit ratio, and return on assets and their relationship with NPL. It is assumed that the stronger the institutional investors share, the lower the nonperforming loans of a bank would be. Strong institutional investors' share is believed to negatively moderate the relationship between the independent variables and nonperforming loans.

The moderating affects result of institutional investors (II) on the relationship between internal factors (CAR, LTD, and ROA) and nonperforming loans (NPL) is presented and discussed in this section. Moderator variable for this study is institutional investors (II) and measured by number of shares held by institutional investors divided by the total number of outstanding shares is expected to moderate the relationship between internal variables and nonperforming loans. Hierarchal multiple regression is used to test the moderating effect in this study. The results of the regression test for conventional banks in Pakistan are presented in the Table 4.17 on page 160 and the summary of result are presented in Table 4.18 on page 169.

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4.8 Hierarchical Moderated Multiple Regression Test Using PCSE Estimator

As mentioned in the earlier chapter, this study employed hierarchical multiple regression to examine the moderating effects (II) on the relationship between internal factors (CAR, LTD and ROA) and nonperforming loans (NPL) of conventional banks in Pakistan. Prais-Winston regression is used to check it and is presented in Model 1, Model 2, Model 3, Model 4 and Model 5.

These regression analyses are performed in three stages or models as suggested by Baron and Kenny (1986). The first model analyzes the relationship between internal variables (CAR, LTD and ROA) and the dependent variable (NPL). The second model, analyzes the relationship between internal variables inclusive of moderating variable (CAR, LTD, ROA and II) and the dependent variable (NPL). The next three models analyze the relationship between internal variables inclusive of moderating variable together with interactions with CAR, LTD and ROA respectively in model 3, model 4 and model 5.

It is to note that the interacting effects of institutional investors are relevant to the internal factors only. According to agency theory, institutional investors are better monitors and this can result in controlling and lowering the levels of nonperforming loans in a bank by aligning their interest of high returns on their investments in a bank. It is indicated that institutional investors are internal to a bank which are monitoring internal factors and their efficient monitoring could lead to the success of the bank. These interactions analysis might have been done for the first time in any banking studies across the globe to date based on review of literature. Its results show the significance of institutional investors for conventional banks in managing their nonperforming loans and credit risk. Therefore, considering the institutional investors as moderator supported by the results of the study particularly in Pakistan and it may be generalized to other developing countries like Pakistan.

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Table 4.17

The Moderating Effects of II on Internal Factors and NPL (using PCSE estimator) for Conventional Banks in Pakistan.

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	***p*-value**	**β**	***p*-value**	**β**	***p*-value**	**β**	***p*-value**	**β**	***p*-value**
CAR	-0.0461	0.1010	-0.0707	0.0220**	-0.0044	0.9210	-0.0758	0.0180**	-0.0514	0.0820*
LTD	-0.0679	0.0140**	-0.0716	0.0120**	-0.0752	0.0080***	-0.0922	0.0040***	-0.0661	0.0170**
ROA	-1.7399	0.0000***	-1.6755	0.0000***	-1.6418	0.0000***	-1.6596	0.0000***	-1.9332	0.0000**
II			0.0195	0.3920	0.0136	0.5370	0.0290	0.2550	0.0096	0.6910
CAR*II					-0.0047	0.0520*				
LTD*II							0.0024	0.0430**		
ROA*II									0.0246	0.0840*
Constant	13.31219	0.0000***	13.48451	0.0000***	13.95496	0.0000***	13.50004	0.0000***	13.43282	0.0000***
R^2		0.5178		0.5036		0.5124		0.5103		0.5221
Change in R^2				-0.0142		0.0088		0.0067		0.0185
Wald χ2- Statistics		63.14		56.15		62.19		58.04		61.43
Sig. χ2- Statistics		0.0000***		0.0000***		0.0000***		0.0000***		0.0000***
Observations		235		235		235		235		235

Note: *p<0.10, **p<0.05, ***p<0.01

NPL is nonperforming loans ratio; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; CAR*II is interaction term of capital adequacy ratio with institutional investors; LTD*II is interaction term of loan-to-deposit ratio with institutional investors and ROA*II is interaction term of return on asset with institutional investors.

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4.8.1 Model 1

The internal variables comprising CAR, LTD, and ROA and the dependent variable, NPL are introduced in the model. The result presented in Table 4.7 on page 160 shows R-Squared (R^2) value of 0.5178 which indicate that the model has a good fit and could explain 51.78% in NPL. Two predictors are found to be significant, LTD (β= -0.0678589, z= -2.45), and ROA (β= -1.73992, z= -7.00) each has negative impacts on NPL of conventional banks in Pakistan which supports the notion that lower lending compared to deposits and lower return on assets, result in higher nonperforming loans. While the predictor CAR (β=-0.0461035, z= -1.64) has no significant impact on NPL of conventional banks in Pakistan.

4.8.2 Model 2

In this model, institutional investors (II) is included as moderating variable. The result presented in Table 4.17 on page 160 shows that this model was significant at 0.000 level with R^2 value of 0.5036 which is little lesser than R^2 value = 0.5178 in model 1. The model therefore could almost explain the same variation in NPL with a difference of 0.0142 with the inclusion of Institutional investors. Further, there are three predictors (CAR, LTD, & ROA) which are found to be significant compared to two (LTD, & ROA) before. CAR (β=-0.0706966, t=-2.29), LTD (β=-0.0715826, t=-2.52), and ROA (β=-1.675483, t=-6.64), have negative impact on NPL, while II (β=-0.0194472, t=0.86) is insignificant in explaining the change in nonperforming loans of Pakistani conventional banks.

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4.8.3 Model 3

Model 3 explains the analysis of the relationship between internal variables inclusive of the moderating variable together with interaction of institutional investors (II) with capital adequacy ratio (CAR, LTD, ROA, II, CAR*II) and the dependent variable (NPL). The result presented in Table 4.17 on page 160 shows that this model was significant at 0.000 levels with adjusted R^2 of 0.5124. The model could explain 51.24% in NPL. There is a positive change of 0.0088 points in the value of R2 with inclusion of interaction term CAR*II which means that explanatory power of the model increased by 0.88% with this moderation. The R^2 value and significance level indicate that Institutional investors moderates (strengthen) the influence of internal factor CAR on nonperforming loans of conventional banks. The detailed influence is discussed below.

4.8.3.1 The Moderating Effects of II on the Relationship between CAR and NPL

The interaction term between CAR*II as shown in Table 4.17 on page 160 yields a negative and significant relationship with NPL (β = -0.0046605, t = -1.94). This result indicated that II (institutional investors) moderates the effect of CAR on NPL of conventional banks in Pakistan. This result supports the hypothesis H_{11}.

The relationship between CAR and NPL is negative but insignificant in Model 1 but with the introduction of II (moderating variable) as an independent variable this relationship between CAR and NPL became significant at 5% significance level without changing the direction of relationship. When II interacts on the relationship between CAR and NPL, it strengthened this relationship moderating it negatively at 5%significance level. In other words, institutional investors helped in reducing the levels of NPL by interacting with CAR which is in line with alignment hypothesis of

agency theory. It provided evidence on the view that institutional investors are good monitors for better performance which is in this case by reducing the number of NPL with increasing of CAR.

Moreover, graph presented in Figure 4.1 shows the effect of II on the relationship between CAR and NPL of conventional banks in Pakistan. The graph shows negative relationship which indicates that high II would increase in CAR and decrease in NPL. Because the slope of the line at high II more steeper towards CAR than it is at low II and it gives lower value of NPL in the graph Meanwhile, low II would increase in CAR and NPL marginally.

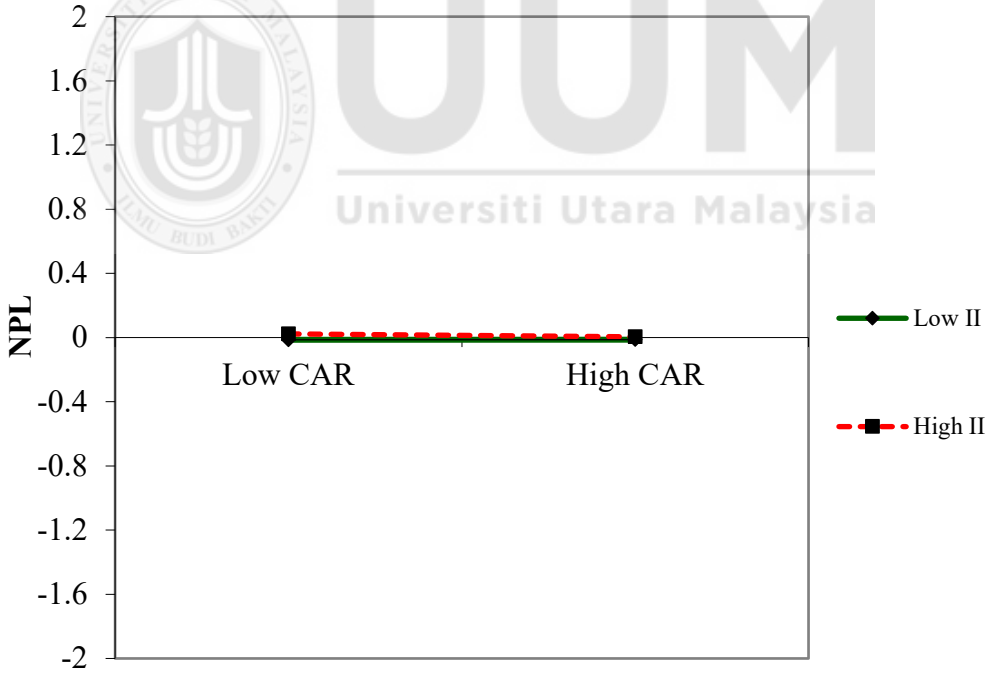

Figure 4.1
The moderating effect of II on the relationship between CAR and NPL for Conventional banks in Pakistan.

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4.8.4 Model 4

This model explains the analysis of the relationship between internal variables inclusive of the moderating variable together with interaction of institutional investors (II) with loan-to-deposit ratio (CAR, LTD, ROA, II, LTD*II) and the dependent variable (NPL). The result presented in Table 4.17 on page 160 shows that this model was significant at 0.000 levels with adjusted R^2 of 0.5103. The model could explain 51.03% changes in NPL. There is a positive change of 0.0067 points in the value of R^2 with inclusion of interaction term LTD*II which means that explanatory power of the model increased by 0.67% with this moderation. The R^2 value and significance level indicate that Institutional investors moderates and reverses the influence of internal factor LTD on nonperforming loans of conventional banks. The detailed influence on each variable is discussed below:

4.8.4.1 The Moderating Effects of II on the Relationship between LTD and NPL

Loan-to-deposit ratio has inverse relationship with NPL at 5% significance level. After the introduction of II (institutional investors) as an independent variable, the relationship between LTD and NPL improves a little but remained at same 5% significance level while II itself has positive but insignificant impact on NPL. But interestingly when II interacted with LTD it not only changes the direction of relationship but also it is statistically significant at 5% significant level. It means that institutional investors are playing the counterproductive role in reducing the number of NPL when it interacted with LTD which supports the entrenchment hypothesis of agency theory. In other words, it supports the view that institutional investors invested in more risky projects or they lent to more risky customers that rather increased the levels of NPL.

The hierarchical regression result in Table 4.17 on page 160 shows that the interaction term LTD*II has positive and significant impact on NPL (β = 0.023981, t = 2.03). Hence, the result in Model 4 indicated that institutional investors moderated the effect of LTD on NPL of conventional banks in Pakistan. This result supports the hypothesis $H_{12,}$ which implies that institutional investors moderates the LTD's relationship with nonperforming loans.

The graph present in Figure 4.2 indicates that the effect of II on the relationship between LTD and NPL of conventional banks in Pakistan. The graph shows the when II is higher at higher LTD, it will help in decreasing the level of NPL but LTD is low the interaction of II will increase the level of NPL which is the case of this study and as it is interpreted above in this study the interaction on II is substantiating entrenchment hypothesis of agency theory. Thus, it is recommended to improving the liquidity of the individual banks with controlled II might help in controlling and reducing NPL of the of conventional banks in Pakistan.

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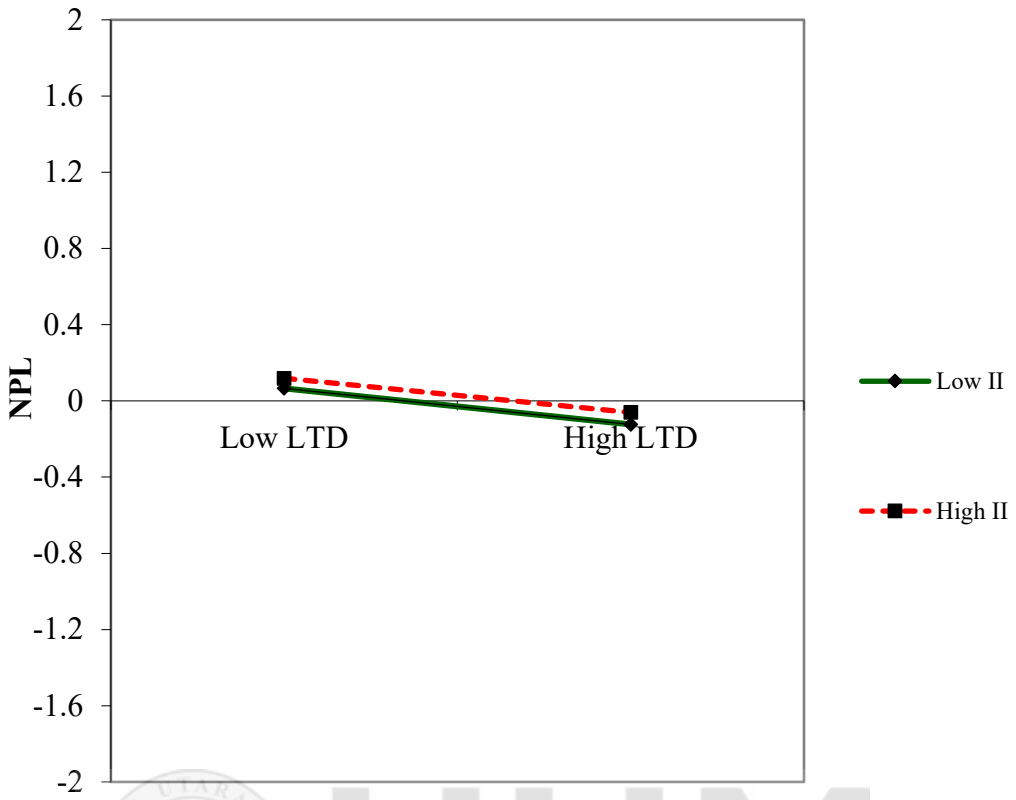

Figure 4.2
The moderating effect of II on the relationship between LTD and NPL for Conventional banks in Pakistan.

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4.8.5 Model 5

This model explains the analysis of the relationship between internal variables inclusive of the moderating variable together with interaction of institutional investors (II) with return on assets ratio (CAR, LTD, ROA, II, ROA*II) and the dependent variable (NPL). The result presented in Table 4.17 on page 160 shows that this model was significant at 0.000 levels with adjusted R^2 of 0.5221. The model could explain 52.21% changes in NPL. There is a positive change of 0.0185 points in the value of R^2 with inclusion of interaction term ROA*II which means that explanatory power of the model increased by 1.85% with this moderation. The R^2 value and significance level indicate that Institutional investors moderates and reverses the influence of internal factor ROA on

nonperforming loans of conventional banks. The detailed influence on each variable is discussed below:

4.8.5.1 The Moderating Effects of II on the Relationship between ROA and NPL

Return on assets has a very strong inverse relationship with NPL at 1% significance level and this relationship did not change after including II as an IV in the model while II itself has positive but insignificant relationship with NPL. But when II interacted with ROA it changed the direction of relationship from negative to positive significantly at 10% level. It also supports the entrenchment hypothesis of agency theory. Alternatively, we can say that institutional investors have invested in riskier projects to get quicker and better returns but it resulted in increase in bad loans.

The interaction terms on relationship between ROA*II and NPL of conventional banks in Pakistan were examined. The hierarchical regression result illustrated in Table 4.1 on page 167 shows that the interaction term ROA*II is positively and significantly related to NPL (β=0.0245832, t=1.73). Hence, this result supports the hypothesis H_{13}.

The graph present in Figure 4.3 indicated that the effect of II on the relationship between ROA and NPL of conventional banks in Pakistan. The graph shows that the lines of high II and low II are intersecting and the slopes of intersecting lines cannot be same so interaction is there. The moderation could be beneficial at high ROA when II is high or II is low in handling NPL but the situation will be deteriorating at low ROA and the moderation effect will give rise to the levels of NPL at both high and low II which is the case in this study. Therefore, it is recommended to control II and ROA of individual banks to take the support of aligning hypothesis of agency theory to get the favoring impact of this moderation.

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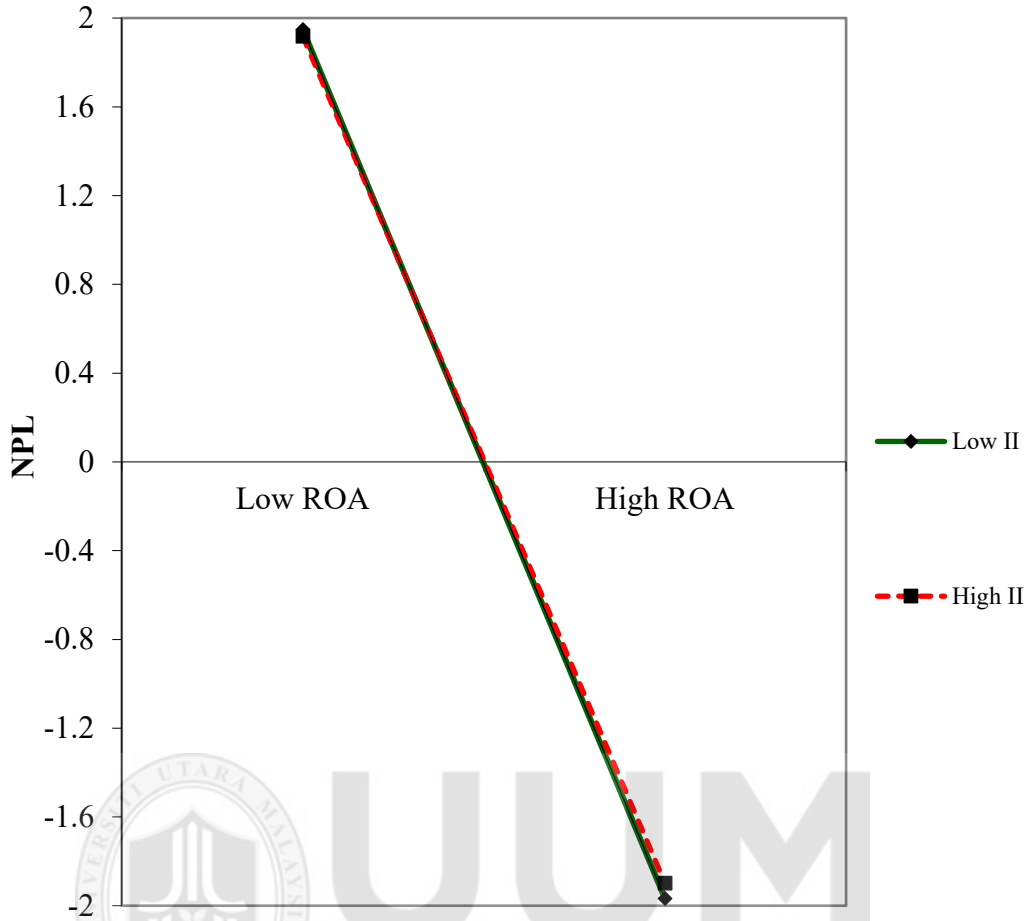

Figure 4.3
The Moderating effect of II on the relationship between ROA and NPL of Conventional banks in Pakistan.

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4.8.6 Summary Results of the Moderating Model for Conventional Banks in Pakistan

The summary of the moderating effects of institutional investors (II) on the relationship between internal variables and nonperforming loans (NPL) are presented in Table 4.18 on page 169 and summary of accepted or rejected hypotheses are presented in Table 4.19 on page 170 for Conventional banks in Pakistan:

Table 4.18

*Summary of the Results of Internal Factors only (Model 1), Internal Factors with Moderator as Internal Factor (Model 2), and Moderations of CAR*II (Model 3), LTD*II (Model 4), ROA*II (Model 5)*

Independent Variables	**Dependent Variable (NPL)**				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
CAR	Insignificant (-)	**Significant (-)**	Insignificant (-)	**Significant (-)**	**Significant (-)**
LTD	**Significant (-)**	**Significant (-)**	**Significant (-)**	**Significant (-)**	**Significant (-)**
ROA	**Significant (-)**	**Significant (-)**	**Significant (-)**	**Significant (-)**	**Significant (-)**
II		Insignificant (+)	Insignificant (+)	Insignificant (+)	Insignificant (+)
CAR*II			**Significant (-)**		
LTD*II				**Significant (+)**	
ROA*II					**Significant (+)**

Note: NPL is nonperforming loans ratio; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; CAR*II is interaction term of capital adequacy ratio with institutional investors; LTD*II is interaction term of loan-to-deposit ratio with institutional investors and ROA*II is interaction term of return on asset with institutional investors.

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Table 4.19

Summary Results of the Moderating Effects on the relationship between Internal Factors and Non-Performing Loans for Conventional Banks in Pakistan.

Independent Variables	**NPL**	**Interaction Variables**	**NPL**
CAR	Insignificant (-)	CAR*II	**Significant (-)**
LTD	**Significant (-)**	LTD*II	**Significant (+)**
ROA	**Significant (-)**	ROA*II	**Significant (+)**

NPL is nonperforming loans ratio; CAR is capital regulation measured by total capital to risk weighted assets; LTD is loan-to-deposit ratio measured by dividing total loans disbursed to total deposits; ROA measures return on assets; II is percentage of shares held by institutions; CAR*II is interaction term of capital adequacy ratio with institutional investors; LTD*II is interaction term of loan-to-deposit ratio with institutional investors and ROA*II is interaction term of return on asset with institutional investors.

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4.8.7 Summary of Discussion on Results of the Moderating Models for Conventional Banks in Pakistan

Table 4.19 shows interesting facts on the moderating effect of institutional investors on the relationship between the bank-specific variables as shown in Model 3, Model 4 and Model 5.

For conventional banks in Pakistan, the "institutional investors" has significant moderating effect on all three (3) internal variables as institutional investors significantly moderates the relationship between (CAR, LTD, and ROA) and nonperforming loans at 5% significant level for LTD*II while at 10% significant level for CAR*II and ROA*II. The results indicate that high participation of institutional investors in management structure of conventional banks, increases the levels of nonperforming loans in conventional banks of Pakistan and decrease in lending growth and increase in CAR and decrease in return on assets is not helping in decreasing the volume of nonperforming loans.

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Table 4.20
Summary of Hypotheses Test Results of the Effects of II on the Relationship between Internal Factors and Non-Performing Loans for Conventional Banks in Pakistan.

	Independent Variables	NPL
H_{11}:	The influence of CAR, on nonperforming loans of conventional banks in Pakistan is moderated by the institutional investors.	**Hypothesis is accepted**
H_{12}:	The influence of loan to deposit ratio, on nonperforming loans of conventional banks in Pakistan is moderated by the institutional investors.	**Hypothesis is accepted**
H_{13}:	The influence of return on assets ratio, on nonperforming loans of conventional banks in Pakistan is moderated by the institutional investors.	**Hypothesis is accepted**

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study investigates and analyses the relationship between external and internal factors with nonperforming loans in particular, as well as moderating impact of institutional investors on the relationship between internal factors and nonperforming loans of the conventional banks in Pakistan. The motivation for studying the nonperforming loans determinants comes from the inconclusive evidence of the relationship between external and internal factors with nonperforming loans of Conventional banks. Meanwhile, the motivation to focus on the impact of institutional investors as a moderating variable on the relationship between internal factors and nonperforming loans stems from the importance of one of the corporate governance mechanism and internal monitoring of the conventional banks which was not tested before. The importance of the relationship and effect of these factors of the nonperforming loans of conventional banks has been analyzed in this study. The results allow peculiar evaluation to be done on the determinants of nonperforming loans of conventional banks in Pakistan. The next section presents a recapitulation of the findings.

5.2 Recapitulation of the Findings

To recapitulate, the findings are presented based on the sequence of the three research objectives as follows:

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5.2.1 Objective 1

To examine the relationship between external factors (gross domestic product, lending interest rate, unemployment rate, bank credit to private sector, energy gap, corruption control index and political stability index) and level of nonperforming loans among conventional banks in Pakistan. The result is presented in Table 4.15 (Page 144).

The coefficient estimation result of GDP is positively and significantly related to nonperforming loans of Conventional banks in Pakistan. The result indicated that GDP is a significant determinant and may contribute to an increase in nonperforming loans for Conventional banks in Pakistan. This result was supported by Inekwe (2013), Nkusu (2011) and Glen and Mondragón-Vélez (2011). It supports the view that in economic boom, banks do aggressive lending or lending with soft credit conditions in pursuing higher returns.

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Lending interest rate is also positively and significantly related to nonperforming loans of Conventional banks in Pakistan. The result indicated that high lending interest rate has an increasing influence on nonperforming loans for conventional banks in Pakistan. The results are supported by Beck *et al.*, (2015), Erdinç and Abazi (2014), Muntean (2014), Waqas, Fatima, Khan, and Arif (2017) and Ashfaq, Younas, and Mehmood (2014).

On the other hand, unemployment rate is negatively and significantly influencing the nonperforming loans of conventional banks in Pakistan. The result showed that unemployment rate has a decreasing impact on nonperforming loans for conventional banks in Pakistan. This is supported by the study of Zaib, Farid and Khan (2014).

Bank credit to private sector is also negatively and significantly associated to nonperforming loans of conventional banks in Pakistan and significant. The result showed that low bank credit to the private sector has an increasing influence on nonperforming loans for conventional banks in Pakistan. The results are supported by Amin, Chernykh, and Imam (2014), Klein (2013), Fofack (2005) and Nkusu (2011).

The multiple panel regression result shows that there is positive and significant relationship between energy gap and nonperforming loans of their conventional banks. Energy gap is a new variable tested on its relation to nonperforming loans. It indicates that an increase in energy gap (which represents the difference or gap between electricity supply and demand on country level) would increase the level of nonperforming loans significantly.

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The results also show that both political stability index and corruption control index are negatively related to nonperforming and are significant for conventional banks in Pakistan. Both significant and negative coefficient estimation seem to suggest that the better control on corruption and increased political stability in Pakistan has the ability to curtail the unethical behavior associated with corruption and political instability during the 2006 to 2017 study period though it worked otherwise in the study period and supported to increase in the levels of nonperforming loans in the conventional banks of Pakistan.

5.2.2 Objective 2

To examine the influence of internal factors (capital adequacy ratio, loan-to-deposit ratio and return on assets) on nonperforming loans among conventional banks in Pakistan.

The regression analysis reveals that the coefficient estimation of CAR is negatively and significantly related to nonperforming loans of conventional banks in Pakistan. The result indicates that CAR is being utilized as a regulatory tool to reduce the levels of nonperforming loans for conventional banks in Pakistan confirming that stronger capital base is a good tool to contain the nonperforming loans ratio. Again, the result appears to suggest the more prudent approach taken by central bank in Pakistan in terms of setting higher CAR when they anticipate higher credit risk and nonperforming loans is appropriate. This result supports the many studies (M. Chen et al., 2015; Jameel, 2014; Makri et al., 2014; Meela & Prasad, 2016; Rehman, Zhang, & Ahmad, 2016b).

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Similarly, the coefficient estimation result of loan-to-deposit ratio is also negatively and significantly related to nonperforming loans of conventional banks in Pakistan. The result appears to support the strategy taken by conventional banks in Pakistan to invest in more liquid assets like cash and marketable government securities, hence less in lending and advances which would decrease nonperforming loans. Moreover, it decreases as deposits are increased and/or lending is decreased in conventional banks of Pakistan and thus, converting more loans into nonperforming loans in conventional banks of Pakistan. The result is supported by Durafe and Singh (2016); Cheng *et al.* (2016); Swamy (2015); and Abdullah *et al.* (2012).

The multiple panel regression result shows that there is strong negative and significant relationship between return on assets and nonperforming loans of Pakistani conventional banks. The result indicated that increases in nonperforming loans lowers profitability for conventional banks in Pakistan, hence they need to improve their asset (lending) quality. The result supported by Louhichi and Boujelbene (2016), Chaibi and Ftiti (2015), Makri *et al.* (2014), and Mehmood, Irshad and Ahmed (2013).

As a summary, all three internal variables are significant determinants of nonperforming loans in Pakistani conventional banks. The R^2 value for Pakistani conventional bank model is 0.5178 (51.78%).

5.2.3 Objective 3

To investigate, the moderating effects of institutional investors on the relationship between internal factors and nonperforming loans among conventional banks in Pakistan.

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The summary of hierarchical regression result shows that the interaction between CAR*II and NPL for conventional banks in Pakistan has a negative and significant relationship. This result indicated that institutional investors moderated the effect of CAR on NPL of conventional banks in Pakistan. Similarly, staff efficiency moderated the relationship between CAR and NPL since the interaction between CAR*II and NPL has strengthened from insignificant negative to significant negative relationship.

The hierarchical moderated multiple regression result shows that the interaction between LTD*II and NPL for conventional bank in Pakistan has positive relationship.

The result however indicated that institutional investors moderated the effect of LTD on NPL of conventional banks in Pakistan by changing the negative relationship to positive relationship.

The hierarchical regression results for the interaction between ROA*II and NPL for conventional bank in Pakistan shows a positive relationship. It means that the result reflected that institutional investors moderated the effect of ROA on NPL of conventional banks in Pakistan by changing the negative relationship to positive relationship.

Thus, from the interaction results of LTD*II and ROA*II, it is concluded that regulators should revise and enforce ownership structures of the conventional banks in Pakistan. Moreover, institutional investors of conventional banks in Pakistan should optimize their monitoring capacity and enhance their internal controls mechanism to increase the performance of their banks by curtailing their nonperforming loans.

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The finding for conventional banks in Pakistan revealed that the institutional investors moderate the relationship between CAR, LTD and ROA on nonperforming loans. This is the fact that the interactions yield suggests that regulators and central bank could not take lightly the important role of ownership structure generally and institutional investors specifically in monitoring the conventional banks for their lending and loan recovery activities for good performance. The moderating effect of institutional investors also occurs in the interaction between maintaining regulatory capital buffers and nonperforming loans productively. While the interaction between LTD*II and NPL

and between ROA*II and NPL are counterproductive in conventional banks of Pakistan.

5.3 Contributions of the Study

The findings of this study contribute new information to the body of knowledge in terms of theoretical and empirical contribution. The contributions are presented as follows:

5.3.1 Theoretical Contribution

The conceptual contributions of this study are drawn from the reviews of the literature and the findings of the analyses. Although there are many studies which have addressed the issue of nonperforming loans by using theories like Intermediation Theory, Modern Portfolio Theory and Agency Theory, but most of the studies are focused on developed countries, which have different environments and characteristics than the developing countries. Thus, this study has added to the understanding of Intermediation Theory, Modern Portfolio Theory and Agency Theory in a developing county, specifically on Pakistani conventional banks.

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The study substantiated these theories in many ways; a) it extended to the developing countries like Pakistan; b) it used some new variables in context of Pakistan which are bank credit to private sector, political stability and corruption; c) it used one new variable on energy gap; d) it used most prevalent ownership structure in banking i.e. institutional investors as moderator; e) it used a unique new combination of external and internal variable. The results of all these as mentioned extended the understanding of these theories.

The inclusion of Agency Theory from the ownership structure and Modern Portfolio Theory from the finance in the presence of Intermediation Theory contributed towards the interaction of different theories from which not only the most relevant internal factors were moderated by institutional investors but also all pooled external and internal variables turned to be significant factors influencing nonperforming loans of conventional banks in Pakistan. Thus, all models of the study contributed towards these theories combination as it was conceptualized in the research framework based on this theory combination.

5.3.2 Empirical Contributions

The empirical contributions of the study are further divided into three section namely new focus area, new findings and institutional investors as moderator. First, "New Focus Area" is about the focal points of the study, like single developing country and new unique set of variables are taken with a blend of some new carefully selected variables. Second, "New Findings" is about the results of this study which are different or new compared to previous studies. It is two folded, one all new variables taken certainly provided new results while some new results for the other variables are also witnessed by this study. Third, "Institutional Investors as Moderating Variable" provided a new perspective with interesting results about the influence of this ownership structure on NPL which is also one of the performance gauges of banks. These are concluded briefly as follows:

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5.3.2.1 New Focus Area

Unlike past studies such as (Angela & Irina, 2015a; R. Beck et al., 2015; Bougatef, 2015; Dimitrios et al., 2016; Louhichi & Boujelbene, 2016; Nor & Ahmad, 2015), those

used pooled data for U.S banking system, European, Asian countries. This study has taken one South Asian country which is Pakistan. Therefore, new research setting was developed by extending the research framework to introduce the moderating effect of institutional investors (II) in the conceptual framework for nonperforming loans in the conventional banks of Pakistan. II was selected as a moderator in light of a high concentration of institutional investors in ownership structure of conventional banks in Pakistan.

The result from hierarchical moderated multiple regression provides a new empirical evidence of the moderating effect of II on the relationship between CAR, loan to deposit ratio and return on assets with nonperforming loans. Hence, this study is first of its kind to best of researcher's knowledge in this regard. While this study also provides new empirical evidence regarding the relationship between selected external and internal factors with nonperforming loans in conventional banks of Pakistan. This study is also different from the previous studies in both Pakistan and around the world (F. Ahmad & Bashir, 2013; M. Chen et al., 2015; Dimitrios et al., 2016; Islam & Nishiyama, 2016; Kashif, Iftikhar, & Iftikhar, 2016; Khan, Ahmad, Khan, & Ilyas, 2018; Konstantakis et al., 2016; Maria, Mehmood, & Kashif, 2016; B. Mehmood et al., 2013; Waqas et al., 2017; Waris & Siddiqui, 2014; Zhang et al., 2016), different set of independent variables and variables like energy gap, bank credit to private sector, corruption and political stability are new.

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5.3.2.2 New Findings

This study extends the contributions of previous studies on nonperforming loans of conventional banks by furnishing new evidence on nonperforming loans of

conventional banks in Pakistan. Unlike previous studies that found increase in GDP growth rate decreases nonperforming loans of banks (i.e., Ahmad & Bashir, 2013; Farhan *et al.*, 2012; Islam & Nishiyama, 2016; Jameel, 2014; Kashif *et al.*, 2016; Khan *et al.*, 2018; Maria *et al.*, 2016; Mehmood *et al.*, 2013; Waqas *et al.*, 2017; Waris & Siddiqui, 2014; Zaib *et al.*, 2014), this study found a different result for Pakistani banks. The results show that increase in annual GDP growth rate or the economic boom does give rise in the levels of nonperforming loans in Pakistani banks. Non-performing loans of Pakistani banks is found to be influenced by corruption in Pakistan. In contrast to previous study (i.e., Ahmad, 2013) which found that corruption has insignificant influence on nonperforming loans of Pakistani conventional banks, this study shows that higher the corruption the higher will be levels of nonperforming loans. Moreover, lower levels of political stability and bank credit to private sector induce higher nonperforming loans in Pakistani conventional banks.

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Further, the energy gap (crisis) extend previous study (Farhan *et al.*, 2012) by providing empirical evidence on the negative relationship between energy gap and bank's nonperforming loans in Pakistan based on annual data of energy demand and supply.

In a nutshell, the new evidence is that the all identified external factors such as annual growth rate of GDP, lending interest rate, annual unemployment rate with 1-year lag, bank credit to private sector, energy gap, corruption and political stability are the dominant factors influencing nonperforming loans of conventional banks in Pakistan. This result proved that conventional banks were affected by these external factors tested.

This study also examined internal factors such as CAR, loan-to-deposit ratio and return on assets as predictors of nonperforming loans as independent variables. The significant impact of ROA (return on assets) and LTD (loan-to-deposit ratio) on nonperforming loans provides fresh findings to conventional bank management. Since nonperforming loans affect ROA and LTD, management of conventional banks need to ensure the lending and investment to only feasible projects through better and improved credit screening and rationing in order to help avoid the conventional banks from adverse effects of nonperforming loans. The results of CAR strengthened the previous studies (i.e., Jameel, 2014; Rashid, Azid, & Malik, 2014) which explains that higher regulatory capital in the form of CAR reduces the risk of increasing the levels of nonperforming loans in Pakistan.

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5.3.2.3 Institutional Investors as Moderating Variable

Unlike previous studies, this study does not only examine the direct relationship between internal factors and nonperforming loans of conventional banks in Pakistan but also examine a new area which is the moderating effect of institutional investors on the relationship between internal factors and nonperforming loans. Using hierarchical moderated multiple regression test, this study offered a first-time evidence that institutional investors moderates significantly the relationship between internal factors and nonperforming loans. This significant result provides empirical evidence that institutional investors strengthens the effect of CAR in reducing nonperforming loans of conventional banks. While it changes the direction of relationship between LTD and ROA with nonperforming loans implying that it is counterproductive in reducing the levels of nonperforming loans in Pakistani conventional banks. However, taking

institutional investors as a moderator is a new contribution in banking studies for conventional banks.

5.4 Implications of the Study

The current study findings lead and motivate to certain implications. There are two types of implications that can be proposed by referring to utility of the results of this study. These results may be helpful at policy-level where both policymaking and regulations are worked out. The central bank and government are at the level of policy implications. While these results may also be helpful at implementation level. The bank inside management and the central bank which is the implementor besides a regulator lie at the level of practical implications. Thus, the role of the central bank at both levels is very demanding and significant. These implications are concluded in the following sub sections.

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5.4.1 Policy Implications

The findings of this study imply the effectiveness of the government's policies in controlling and monitoring the conventional banking system in Pakistan is somehow not satisfactory. The result implies that conventional banks' institutional owners (institutional investors) place an important role to mitigate the issue of nonperforming loans. This mitigation ability could be enhanced with the formulation of appropriate rules and regulations to safeguard banks' interests to avoid unhealthy activities that could cause unnecessary risks in conventional banks including the risk of increasing the levels of nonperforming loans. Thus, the authorities such as Ministry of Finance and Central Bank (SBP) are recommended to formulate new policies on not only recoveries and lending restructuring but also define a better mechanism to control and

check ownership structure of banking sector in general and especially controlling the level of stake of institutional investors in banking sector which could safeguard the interests of depositors and minor shareholders by reducing their losses due to nonperforming loans in conventional banks of Pakistan.

The study also examines the relationship of macroeconomic factors with nonperforming loans. This provides evidence that the relationship exists between macroeconomic factors and nonperforming loans in conventional banks of Pakistan. The effect of GDP, interest rate and energy gap on nonperforming loans of bank is positive, while effect of unemployment, credit to private sector, corruption and political stability is negative. This gives an understanding to the regulatory authorities of Pakistan to devise effective regulation with autonomy that can control the effects of both corruption and political influence in lending of conventional banks and ensure sufficient credit approval to private with proper screening and feasibility their projects that are in need of capital. The results imply that the government of Pakistan should ensure enabling environment to run the private sector with support of uninterrupted power supply. The policy defined on these implications could help to limit the costs of economy on financial system distress to reduce likelihood of failure due to increase in nonperforming loans in the banking sector of Pakistan.

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5.4.2 Practical Implications

The results imply that conventional banks can develop plans and strategies which could be put into practice based on these findings. First is to build a systematic structure of continuous professional development in credit and risks management to effectively manage the levels of nonperforming loans. Second is to be watchful on the conflicting

consequences of loan growth. For Pakistan, loan growth is significant but negative related to nonperforming loans. Although it is very desirable to increase loan portfolio as they have the potential of higher income, the conventional banks management at the same time has to exercise strong monitoring and control mechanism along with good corporate governance adopting a balanced ownership structure.

The results on the relationship between regulatory capital, liquidity, return on assets and external factors including some macroeconomic factors and prevailing ownership structure (Institutional Investors) shows the significant role of each variable to nonperforming loans which cause banks to have great losses or consequently become insolvent. The results thus imply that banks should observe prudential regulations on capital management to protect from capital erosion due to credit risks or high non-performing loans. This could be done through compliance to higher level of risk management requirements through the adoption of Basle III, which have not yet been implemented fully in Pakistan banking system.

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5.5 Limitation of the Study Scope and Limitation of the Study

There are some limitations pertaining to this study that needs to be taken into account. First, this study is limited by its framework and examined only conventional banks and no other financial institutions in Pakistan. Islamic banks are omitted due to two reasons. Firstly, they are few in number and most banks established in recent years and sufficient data is not available. Secondly, it is not the focus of the study because it is not a comparative study between conventional and Islamic banking. Thus, the results of this study are limited to nonperforming loans of conventional banks in Pakistan and also do

not represent the nonperforming loans of the conventional banks in other parts of the world.

Second, this study is limited to the determinants of NPL in Pakistani conventional banks. Therefore, the findings of the study provide an evidence on how identified variables that are considered to be the most relevant in Pakistani environment both from external and internal viewpoint have influenced the NPL. Thus, this study does not cover all other variables that could have an influence on NPL such as exchange rate, inflation, interest margin etc. but those are not captured in the model due to their relative importance in the context of Pakistan.

Third, the study is confined to the data from secondary sources only and the results established are limited to published annual audited accounts of the banks for 2006 – 2017 study periods only. This time frame captured the maximum dataset as after many mergers & acquisitions and the establishment of some new banks during 2005 whose data was available from 2006.

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Fourth, the data for this study was obtained from State Bank of Pakistan, Economic Survey of Pakistan, NTDC (a subsidiary of WAPDA) and World Bank which are limited. Hence, full complete set of data could not be made available that lead to unbalanced data. Also, some of the conventional banks in Pakistan have started their operations in later than 2006.

5.6 Suggestion for Future Research

Pursuant to the present study, several inputs for future research may be undertaken are suggested as follows:

First, nonperforming loans of conventional banks is one of the important issues that have been debating for long and that in the recent years stems mainly to the global economic crises. Conventional banks place an essential role as intermediation parties that involve in default risk or nonperforming loans in their business and become a continuous issue. However, there are very limited empirical studies which can be found. Thus, it is suggested that more research to be conducted to identify the determinants of nonperforming loans of conventional banks. The topics should not be limited to several macroeconomic and banks specific factors only but also look at other related areas in depth such as government policy, ownership, global crisis, Islamic perspective, legal implication and public perspectives. This study, though, used quantitative analysis but some of future studies on the perspective topics may be taken up either using qualitative or mixed mode analysis based on dynamics of the proposed study.

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Second, in order to obtain more comprehensive analysis of the nonperforming loans of conventional banks, a comparative study between countries or regions like SAARC or ASEAN regions where external environments are almost similar. Thus, it is recommended that an individual country from these regional countries study is to be conducted for the purpose of comparing the results between them in order to detect country specifics.

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Appendix A: List of Banks Mergers/Acquisitions in Pakistan during 2006-2015

S#	Merged Bank Name	Merged with Bank Name	Date
1	Union Bank Limited	Standard Chartered Bank (Pak) Ltd.	29-Dec-06
2	PICIC Commercial Bank Limited	NIB Bank Limited	1-Jan-08
3	The Royal Bank of Scotland Limited	Faysal Bank Limited	3-Jan-11
4	Atlas Bank Limited	Summit Bank Limited	11-Jan-11
5	MyBank Limited	Summit Bank Limited	6-Jul-11
6	KASB Bank Limited	BankIslami Pakistan Limited	11-May-15
7	HSBC Oman	Meezan Bank Limited	30-Sep-15
8	Barclay's Bank Plc	Habib Bank Limited.	29-Apr-15

Source: Competition Commission of Pakistan (2015)

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Appendix B: The Sources of Data Collection for Each Variable

Variables	Description	Source
Non-Performing Loans (NPL)	Ratio	State Bank of Pakistan (SBP)
Gross domestic product (GDP)	Aggregate Economic Activity	Economic Survey of Pakistan (ESP)
Lending Interest Rate (LIR)	Average Annual Interest Rate	Economic Survey of Pakistan (ESP)
Unemployment Rate (UR)	Ratio	Economic Survey of Pakistan (ESP)
Bank Credit to Private Sector (BCPS)	Ratio	Economic Survey of Pakistan (ESP)
Energy Gap (EG)	Ratio	Water and Power Development Authority (WAPDA)-NTDC
Political Stability Index (PSI)	Percentile Ranking	WGI (World Bank)
Corruption Control Index (CCI)	Percentile Ranking	WGI (World Bank)
Capital Adequacy ratio (CAR)	Ratio	State Bank of Pakistan (SBP)
Loan to deposit ratio (LTD)	Ratio	State Bank of Pakistan (SBP)
Return on Assets (ROA)	Ratio	State Bank of Pakistan (SBP)
Institutional Investors (II)	Ratio	State Bank of Pakistan (SBP)

Source: Author's compilation

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Appendix C: Sector Wise List of Banks

S#	Name of the Bank	Notation	Sector
1	First Women Bank Ltd.	FWBL	Public
2	National Bank of Pakistan	NBP	Public
3	Sindh Bank	SINDHBANK	Public
4	The Bank of Khyber	BOK	Public
5	The Bank of Punjab	BOP	Public
6	Allied Bank Ltd.	ABL	Private
7	Askari Bank Ltd.	AKBL	Private
8	Bank Alfalah Ltd.	BANKALFALAH	Private
9	Bank AL Habib Ltd.	BANKALHABIB	Private
10	Faysal Bank Ltd.	FAYSALBANK	Private
11	Habib Bank Ltd.	HBL	Private
12	Habib Metropolitan Bank Ltd.	HABIBMETROBANK	Private
13	JS Bank Ltd.	JSBL	Private
14	MCB Bank Ltd.	MCB	Private
15	SAMBA Bank Ltd.	SAMBABANK	Private
16	Silk Bank Ltd.	SILKBANK	Private
17	Soneri Bank Ltd.	SONERIBANK	Private
18	Standard Chartered Bank (Pakistan) Ltd.	SCB	Private
19	Summit Bank Ltd.	SUMMITBANK	Private
20	United Bank Ltd.	UBL	Private

Source: Author's Listings copied from Financial Stability Review 2015 by SBP.

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Appendix D: Official Mail Image of Receiving Energy Data

gmtech@ntdc.com.pk

1 of 4

Demand and Supply data Inbox x

GM Tech <gmtech@ntdc.com.pk> Apr 20, 2017, 1:21 PM
to me, engrmahmood.ahmad@gmail.com

Dear Abid Mahmood.

AoA.

find attached and reforward as discussed the Deamand and supply data of Energy in Pakistan provided by Planning department. Please review and give your suggestions. i am also appriciate you to working in the best interest of the Pakistan.

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