Impact of Credit Management on the Financial Performance of Banks: A Case Study of Canadian Banks

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ABSTRACT

Credit is of a sensitive disposition not to be treated with utmost vigilance in any organization especially in banks which the circumstance is more significant. The aim of this study is to investigate the impact of credit management on the financial performance of banks. Panel data analysis was used to analyze the secondary data collected for 8 Canadian banks over the period of 16 years (2000-2015). In this study, return on assets (ROA) and return on equity (ROE) are used as a measure of banks' financial performance whereas non-performing loan ratio (NPLR), loan loss provision ratio (LLPR), loans to deposit ratio (LTDR), loans to asset ratio (LTAR), cost per loan asset ratio (CLAR) and total debt to total asset ratio (TDTAR) were used as proxies for credit risk. It was found that NPLR, LLPR, LTDR and CLAR were all statistically significant and inversely related to banks' financial performance (ROA) whereas LTAR was statistically significant and positively related to ROA. On the other hand, NPLR and LLPR were statistically significant and inversely related to ROE, while LTAR was positively related but LTDR, CLAR and TDTAR were all statistically insignificant. On the basis of the findings, it shows credit risk has a negative influence on financial performance of banks thereby saying good credit management is of utmost importance to banks. Therefore, banks need credit to survive and hence adequate attention needs to be paid to credit administration in banks.

Keywords: credit risk, credit management, financial performance, banks, panel data analysis.

ÖZ

Bu çalışmanın amacı, bankaların mali performansı üzerindeki kredi yönetiminin etkisini araştırmaktır. Panel veri analizi ile 16 yıllık süreyi içeren (2000-2015) ikincil veriler doğrultusunda 8 Kanada bankasının performans analizi yapılmıştır. Aktif getiri (ROA) ve özkaynak kârlılığı (ROE), takipteki krediler (NPLR) öncelikli veriler olararak kullanılmıştır. Kanada bankalarınında kredi riski aktif getiri üzerinde anlamlı sonuçlar verirken , sermaye üzerinden getiri üzerinde ise ters yönde bir ilişkiye rastlanmıştır. Bu doğrultuda bankaların hayatta kalmak ve de finansal performanslarını iyileştirmek için etkin kredi yönetimi oldukça önemli olduğu sonucuna varılmıştır.

Anahtar Kelimeler: kredi riski, kredi yönetimi, finansal performans, bankalar, panel veri analizi.

TO MY LOVING PARENTS

SIR MARSHALL OKPARA

AND

LADY FLORENCE NONYE OKPARA

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CLAR   Cost per loan asset ratio

E-VIEWS   Econometric views

LLPR   Provision for loan losses

LTDR   Loan to deposit ratio

LTAR   Loan to asset ratio

NPLR   Non-performing loans

ROA   Return on asset

ROE   Return on equity

TDTAR   Total debt to total asset ratio

Chapter 1

INTRODUCTION

1.1 Background of the Study

Banks are key participants of economic growth due to the vital services they render in the financial system (Kolapo et al., 2012). They transfer scarce funds from excess unit of the economy to the insufficient unit, making them an integral constituent of the financial system. Nzotta (2004) stated that banks, through activities of borrowing and organization of deposits, to some extent, affect the mold and direction of economic development.

In banks, issuing credit happens to be the major source of generating income, the extent in which the credit facility is managed defines the success or failure rate of the bank. This is due to the default risk banks are exposed to while issuing credit which needs to be efficiently managed to achieve the essential growth level and performance of loans.

Banks face different types and degrees of risks which hinge on features such as its size, intricacy of the business activities, volume and so on. It is understood that banks face Credit, Insolvency, Interest rate, Foreign exchange, Operational, Off-balance sheet, Liquidity, Sovereign and Market risks among which credit risk is acknowledged to have unfavorable impact on profitability and growth. This is as a result of the large portion of bank's revenue which is obtained from the interest

accrued from loans (Samuel, 2015). Hence, the success of most commercial banks lies on the achievements in credit management mitigating risk to the acceptable level.

Deposit money is created when commercial banks expand either their loans or their investments in securities. Bank loans are distinguished from investments, in that commercial banks' loans are generally made directly to the banks' customers while bank investments are usually made indirectly through various securities markets (Klein, 1978). Bank loans or credits constitute the largest category of bank assets and are very diverse (Klein, 1978 and Nzotta, 2004). This diversity makes the commercial bank credits very crucial to banks' survival.

Credit is of a sensitive nature not to be treated with utmost vigilance in any organization especially banks in which the circumstance is more significant. The scarcest relax by any organization on its credit management strategies may impose damages which may be irrevocable or revocable at a very prohibitive cost (Pandey, 2009). Credit risk is described as the impending failure by a debtor to meet its commitment in due time as contracted (Basel Committee on Banking Supervision, 1999).

On the other hand, a well thought out credit policy by an organization could lead the company to very great heights profit-wise. However, the right to receive trade credit or bank credit is sometimes taken for granted by the beneficiaries. This explains why tact and diplomacy should be employed when handling credit matters by organizations. Accordingly, Bass (1991) reasons that if industries or companies only sold goods to purchasers who are willing to pay on the spot, it would quickly lead to

a halt in commerce and thereby affecting the economy's perception of mass production which relies on constant buying activities.

In the same vein, bank investment programmes, which are invigorated through the extension of credits, will be jeopardized. Again, this need to grant credit if not properly checked will result in a substantial amount of cash of an organization being tied up in account receivable otherwise called debtors. This in truth is the root of credit administration issues (Bass, 1991).

Profitable enterprises rely on cash flowing through the company at a sufficient pace to satisfy all obligations. In other words, such companies have to be liquid and at the same time profitable. Returns are generated when assets are used efficiently, but may never be actualized if the cash flow is slow moving. Commonly, to hold large amount of cash balances is nonprofitable since idle cash yields no interest in any organization. Profit is however realized in commercial banks through the extension of quality credits and other sound investments activities. However, the extent the credit facility is managed, will determine the success or failure rate of the bank bearing in mind the fact that credit constitutes the largest asset in any commercial banks portfolio. This is to say therefore that, bank credit happens to be the major source of income for the financial institutions. Consequently, this study focuses on the impact of credit management on the financial performance of banks.

Debtors evidently are liable for financial deficits of most banks. In order to satisfy its overhead costs, commercial banks rely on cash movement through the system at a definite speed.

If that speed reduces due to debtors are on the loose, we have a "cash flow" problem. In more severe cases, the bank may end up being distressed or even liquidated.

1.2 Statement of the Problem

Credit management has been in existence in commercial banks and other business organizations since several years back (Nzotta, 2004). The importance of credit in the performance rating of any enterprise cannot be overlooked.

Most commercial banks realize a lot of income through credit administration; which has led to the continued attraction towards lending in banks till date. However, due to this continued attraction towards credit administration and it gains, lots of commercial banks have been walloped into serious troubles like liquidity problems, getting distressed and in very severe cases getting liquidated. This study therefore seeks to know why despite the all-important role played by credit management in the overall performance of banks, lending has persistently been a major source of worry in most commercial bank problems.

It is also believed that some banks lend without recourse to the Apex bank of the country regulations or policies on credit administration guidelines in order to make quick gains, leading to large volume of loan defaults.

1.3 Objectives of the Study

Having stated the problems, our principal objective is to investigate the impact of credit management on banks' financial performance in Canada. Specifically the study intends to accomplish the following:

- To determine the nature of relationship between credit management and banks financial performance.

- To determine the influence of non-performing loans on banks' financial performance.

- To ascertain the influence of cost per loan assets on banks' financial performance.

- To evaluate the effect of loan loss provision on banks' financial performance.

- To ascertain the influence of loans to assets on banks financial performance.

1.4 Research Questions

The following research questions are therefore, considered relevant for the study.

1. What is the relationship between bank credit management and bank financial performance?

2. To what extent does bank non-performing loan affect the level of bank financial performance?

3. What is the influence of cost per loan asset on banks' financial performance?

4. What is the influence of loan loss provision on the financial performance of banks?

5. To what extent do loan to asset ratio influence banks' financial performance?

1.5 Hypotheses of the Study

With the above stated objectives, the following hypotheses are formulated for the study.

H_{O1}: There is no significant relationship between bank non-performing loans and banks financial performance.

H_{O2}: There is no significant relationship between cost per loan asset and banks' financial performance.

H_{O3}: There is no significant relationship between loan loss provision and banks' financial performance.

H$_{O4}$: There is no significant relationship between loans to assets and banks' financial performance.

1.6 Significance of the Study

Banks credit, it is believed, is the most important source of banks' incomes (Nzotta, 2004). This therefore affects a bank's profitability, short and long term growth prospects. Credits granted by banks form essential aspects of the banks' assets. Credits also affect the liquidity situation in banks. This study is therefore essential to commercial banks as it is expected to expatiate on the role this bank credit plays in banks' financial performance and its consequences when not properly harnessed resulting in bank distress and even liquidation. Hence, this research will be of interest to policy makers and stakeholders on how to face credit risk in order to improve the value of risky assets of banks and the economy in general.

1.7 Organization of the Thesis

This work is arranged in six sections. Chapter one discusses the background of the study, statement of the problem, objectives of the study, research questions, hypotheses of the study and significance of the study. Chapter two appraises related literatures on the topic. Chapter three covers the Canadian banking system, early banking in Canada, banks structure, banks operating in Canada, regulators of Canada's financial system and the impact of Canadian banks on its economy. Chapter four discusses the data and methodology used in the study. Chapter five interprets the results of the analysis. Finally, chapter six presents the conclusion and policy recommendation.

Chapter 2

LITERATURE REVIEW

There is plethora of studies devoted to the relationship between credit risk management and the financial performance of banks especially in Europe and developing countries, but few, at least none to my knowledge has checked the influence of credit risk management on banks' financial performance using Canadian banks as case study.

Nikolaidou & Vogiazas (2014) defined credit risk management as the blend of coordinated activities and processes for monitoring and directing risks faced by a firm through the amalgamation of fundamental risk management strategies and processes in line to the objectives of the firm. Credit risk is described as the impending failure or disappointment by a debtor to meet its debt or commitment in due time as contracted (Basel Committee on Banking Supervision, 1999). Credit risk cannot be totally avoided but efficient management of credit risk helps minimize credit risk to acceptable limits.

The influence of credit risk management on financial performance of banks has brought controversies and debate. This topic has been a huge worry to a variety of studies that show credit risk is a key factor that affects financial performance of banks. Researchers such as (Hakim and Neaime 2001; Kargi 2011; Poudel 2012; Musyoki & Kaduba 2012) amid others have carried out broad studies on this topic

and produced varied results. Several researches show positive relationship of credit risk on bank's financial performance, some found inverse connection and very few others claim that factors other than credit management have greater impact on financial performance of banks.

In the study carried out by Kolapo, Ayeni and Oke (2012) on the effect of credit risk on the performance of Nigerian commercial banks during the time frame 2000-2010 (11years), Return on assets was used as a measure of profit, while the ratios of Non-performing loans to loans and advances, loan loss provision to classified loans and total loans and advances to total deposit were used as proxies of credit risk. They used panel data in their analysis and found out that the credit risk proxies used were all statistically significant and negative relationships existing between non-performing loans and loan loss provision ratios and ROA while a positive relationship exists between total loan and advances ratio and ROA. They advised that Nigerian banks should improve the quality of their credit analysis and administration of loans and also suggested that regulatory bodies should ensure banks comply with the relevant policies.

Poudel (2012) investigated the influence credit risk management has on the financial performance of Nepalese commercial banks. He did so by comparing various proxies of credit risk management (cost per loan assets, CAR and default rate) to banks' financial performance measured by ROA. Using SPSS statistical tool, he found that default rate and CAR were negatively related to banks' financial performance but default rate has a bigger impact. It was also seen that cost per loan assets was statistically not significant, which means no relationship exists between cost per loan assets and performance (ROA) of banks.

Alshatti (2015) examined the impact of credit management on financial performance of commercial banks in Jordan over a 9year period (2005-2013). He used panel data regression analysis to measure the credit risk (CAR, Credit interests to Credit facilities ratio, Leverage ratio, Provision for facilities loss to Net facilities ratio and Non-performing loans to Gross loans ratio) effect on financial performance (ROA and ROE). The findings concluded that the proxies for credit risk used in the research have a significant impact on financial performance of commercial banks in Jordan. Alshatti (2015) suggested that banks should enhance their credit management by strengthening their policies and management system to help achieve more profit and competitiveness of the banks.

Kargi (2011) evaluated the effect of credit risk on Nigerian banks' profitability. He found out that there is a significant effect credit risk has on Nigerian banks' profitability. This is as a result of the inverse or negative relationship between the regressors (loans and advances, deposits and non-performing loans) on banks' profitability, thereby exposing banks to liquidity risk and insolvency.

Kodithuwakku (2015) investigated the consequences credit risk management has on the profitability of commercial banks in Sri Lanka. A five year (2009-2013) panel data of eight (8) banks was used to examine the relationship of the study. The findings showed negative effect of all but one of the credit risk indicators on profitability, thereby recommending banks to employ more efficient techniques to reduce credit risk.

Abbas et al (2014) studied the connection between credit risk exposure and performance of Pakistan's banking sector. Using fixed effect model regression on

panel data analysis over a six year period (2006-2011), the study revealed credit risk proxies had a significant and negative relationship on the performance variables ROA and ROE respectively.

Aduda and Gitonga (2011) examined empirically the financial performance of Kenya's commercial banks with respect to credit management. Quantitative and qualitative analyses were both used in the study. A simple regression analysis was done on thirty (30) banks for ten years (2000-2009) to ascertain the correlation between credit risk management (NPLR) and profitability (ROE). The results show that credit risk has negative effect on profitability in commercial banks in Kenya.

In the research of Kaaya and Pastory (2013), with the use of panel data analysis, it was found that the credit risk proxies used in the study were negatively related to the performance of commercial banks in Tanzania thereby leading to decreased banks profit.

Musyoki and Kadubo (2012) investigated the influence credit management has on Kenyan banks' financial performance. They used bad debt cost, cost per loan assets and default rate as credit risk proxies on bank's performance and found that there is inverse relationship.

Mushtaq, Ismail and Hanif (2015), studied the connection between credit risk, capital adequacy and bank's performance over the period of six years (2007-2012). It was found that credit risk measures used in the research were negatively related and statistically significant. Although CAR had a positive relationship and was also statistically significant.

Gizaw, Kebede and Selvaraj (2015) carried out a research on the effect credit risk has on financial success of commercial banks in Ethiopia within the period 2003-2014. Using panel data analysis, they found out that the credit risk indicators (non-performing loans, provision for loan loss, loan and advance to deposit ratio and CAR) had major effect on profitability (ROA and ROE).

Adeusi et al. (2013) focused on risk management practices and bank financial performance in Nigeria using panel data analysis. The result of the study showed a negative correlation between financial success of banks and doubtful loans, but capital asset ratio showed to be significant and positively related. In other words, concluded that significant relationship exists between bank performance and risk management. Thereby suggesting efficient risk controlling practices of banks.

Fredrick (2012) evaluated CAMEL as proxies for credit risk management on commercial banks' performance in Kenya using multiple regression analysis. The study showed that there is a strong impact between the CAMEL indicators on banks' financial performance (ROE).

A research carried out by Soyemi, Ogunleye and Ashogbon (2014) aimed at investigating risk management practices and financial performance in Nigerian commercial banks. They performed the analysis using cross-sectional data and found out there is statistical significance and positive correlation between the regressors used in the study as proxies for credit risk management and financial performance.

Han (2015) researched on the sources of credit risk in chinese commercial banks by analyzing chinese commercial banks credit management experience and their

insufficiency and puts forward some measures to control the credit risk of commercial banks in China.

Marshal and Onyekachi (2014) carried out an empirical study on the influence of credit risk on the performance of Nigerian banks. They used panel data to perform the analysis for a period of fifteen years (1997-2011) using non-performing loans to loans and advances ratio and the ratio of loans and advances to total deposit as proxies of credit risk and ROA as an indicator for performance. They also transformed the model to its natural logarithm form so as to achieve better results. The findings showed there is a positive link between credit risk proxies used in the study and banks performance.

Megeid (2013) conducted an empirical study which investigates the influence of banks' management of credit risk on improving liquidity in Egyptian commercial banks. He selected eight banks and used data for the period (2004-2010). Using panel data analysis, it was found that there is significant and positive correlation between efficient credit risk management and liquidity in Egyptian commercial banks.

Boahene, Dasah and Agyei (2012) explored the relationship between credit risk and profitablility of some banks in Ghana over a period of five years (2005-2009). Using panel data under the framework of fixed effects, it was found that credit risk has a positively significant relationship with profitability of banks in Ghana.

Njanike (2009) investigated how inefficient management of credit risk led to the failure of Zimbabwe's banks in 2003/2004 bank crisis. He used survey as his

research tool for the study and found out that there were other factors that led to the banking crisis but inefficient credit risk management had more effect.

Abiola and Olausi (2014) carried out an empirical study of the "impact of credit management on banks performance in Nigeria" using panel data analysis. They discovered that credit management indicators used has a significant effect on the profitability of banks in Nigeria.

Hakim and Neaime (2001) evaluated the performance and credit risk in banking sectors of Egypt and Lebanon respectively over the period 1993-1999. They found out that the credit variable used had a statistical significance and it was positively related to bank return.

There is a rather interesting yet controversial study which claims that there is no effect between credit risk management and banks' performance. Kithinji (2010) investigated the impact of credit risk on profitability of banks in Kenya and found out that other variables other than non-performing loans and credits greatly influence banks' profit. The model and the individual t-ratios in the study were not statistically significant at any significance level, which means the model does not institute a relationship between the credit risk and banks' performance proxies used. Thus concluding that most commercial bank's profit is not influenced by credit management and banks should channel their focus on other factors for profit maximization.

Chapter 3

THE CANADIAN BANKING SYSTEM

Banking in Canada is generally regarded as one of the safest banking system in the world. As at 2015, it was rated as the soundest banking system in the world for the eighth year according to reports by the World Economic Forum. The Canadian banking system is made up of two main categories of banks, which are the central bank and the commercial or (chartered banks) as popularly known in Canada (Granger, 2012).

The nation's central bank, Bank of Canada, issues the currency of the nation, maintains its value and serves as the official banker to the government and chartered banks. Its main role is to promote the health of the economy by setting monetary policies. While the chartered banks perform traditional functions, in which they render in the form of financial intermediation. Chartered banks are incorporated and overseen by the federal government under the federal Bank Act which describes the array of activities (Allen, 2006). Over the years, banks have gone further their traditional functions to broaden their services in the form of investment banking, real estate operations and so on.

3.1 Early Banking in Canada

Trade by barter was the only acceptable method in the earliest days of French settlement in Canada when there was no local currency.

In 1792, English firms and Montreal merchants which formed "Canadian Banking Company" made exertions to institute banking practice into the British North American provinces but failed. The failure was as a result of the Canadian Banking Company's inability to obtain license to issue bank notes. Twenty-five years later, the Bank of Montreal was found and by 1822 became chartered.

During 1867 to 1914, Canadian banks were very unstable and their failure rate was relatively high as opposed to banks in the United States. During this period, 26 failures were recorded and 19 of which led to criminal charges against bank employees. The failure rate overturned due to revamped bank regulations and since 1923, Canada has had only 2 bank failures while its neighbor (United States) has had over 15,000.

3.2 Canada's Banking Structure

The Canada banking system is structured or tailored towards that of the English model, therefore allowing branch banking system- few banks with many branches. The competitiveness in the Canadian banking system is very high in that there are extensive varieties of services offered by more than 3,000 companies. Most banks, especially the major banks, compete in all markets while some others are vastly specialized and operate in specialized (niche) markets.

The ''Big Five" banks controls the banking system in Canada thereby principally making the banking system an oligopoly. Big five is the conventional name given to the five major banks that rule the banking industry of Canada. Almost half of the financial system's assets are held by the big six banks. The "Big Five" banks by asset size are Toronto-Dominion Bank, Royal Bank of Canada, Bank of Nova Scotia,

Bank of Montreal and Canadian Imperial Bank of Commerce. These banks control about 90% of the domestic banking assets.

3.3 Banks Operating in Canada

There are 82 banks with over 8,000 branches operating in Canada. Banks in Canada includes 29 domestic banks, 24 subsidiaries of foreign bank, 26 full-service foreign bank branches and 3 foreign bank lending branches. The role of banks in the financial industry of Canada is very important as they serve millions of customers. There are three categories of banks incorporated in Canada. They are:-

- **Schedule I Banks**: These are the domestic banks, they are not a subsidiary of a foreign bank. Under the Canada Bank Act, they are approved to accept deposits. As of 2015, there were 29 domestic banks.

Table 3.3.1(a): Domestic Banks

BANKS	ESTABLISHED	TOTAL ASSETS ($b CAD)
Bank of Montreal	1817	638.719
Bank of Nova Scotia	1832	863.1
Laurentian Bank of Canada	1846	39.64
National Bank of Canada	1859	215.86
Royal Bank of Canada	1864	1,072.14
Canadian Imperial Bank of Commerce	1867	462.802
Toronto-Dominion Bank	1955	1,102.44
Canadian Tire Bank	1968	14.553

Table 3.3.1(b): Domestic Banks

Pacific & Western Bank of Canada	1980	1.56
Canadian Western Bank	1985	22.811
Manulife Bank of Canada	1993	22.1
First Nations Bank of Canada	1996	0.432
President's Choice Bank	1996	3.316
Citizens Bank of Canada	1997	0.111
Hollis Canadian Bank	1998	
CS Alterna Bank	2000	0.189
Zag Bank	2002	0.443
General Bank of Canada	2005	0.925
Bridgewater Bank	2006	1.459
DirectCash Bank	2007	0.33
HomEquity Bank	2009	2.01
B2B Bank	2012	10.324
CFF Bank	2013	0.237
Continental Bank of Canada	2013	
Equitable Bank	2013	15.52
RedBrick Bank	2013	
Rogers Bank	2013	
Tangerine Bank	2013	38
Wealth One Bank of Canada	2015	

Source: The Office of the Superintendent of Financial Institutions, 2015.

- **Schedule II Banks:** These are subsidiaries of foreign banks which are also approved to receive deposits under the Bank Act. There were 24 of such banks in Canada as of 2015.

Table 3.3.2(a): Foreign Bank Subsidiaries

BANKS	PARENT COUNTRY
Bank of China (Canada)	China
Industrial and Commercial Bank of China (Canada)	China
BNP Paribas (Canada)	France
Société Générale (Canada)	France
ICICI Bank of Canada	India
State Bank of India (Canada)	India
Bank of Tokyo-Mitsubishi UFJ (Canada)	Japan
Sumitomo Mitsui Banking Corp. of Canada	Japan
Korea Exchange Bank of Canada	South Korea
Shinhan Bank Canada	South Korea
Habib Canadian Bank	Switzerland
UBS Bank (Canada)	Switzerland
CTBC Bank Corp. (Canada)	Taiwan
Mega International Commercial Bank (Canada)	Taiwan

Table 3.3.2(b): Foreign Bank Subsidiaries

HSBC Bank of Canda	UK
AMEX Bank of Canada	USA
Bank One Canada	USA
Bank of America Canada	USA
BofA Canada Bank	USA
Citco Bank of Canada	USA
Citibank Canada	USA
J.P Morgan Bank Canada	USA
J.P Morgan Canada	USA
Walmart Canada Bank	USA

Source: The Office of the Superintendent of Financial Institutions, 2015.

- **Schedule III Banks:** These are full service foreign bank branches. They are permitted to do the business of banking in Canada but with restrictions. They do not accept deposits of less than C$150,000 in Canada. There were 26 of such banks as of 2015. They include:-

Table 3.3.3(a): Full Service Foreign Branches

BANKS	PARENT COMPANY
China Construction Bank Toronto Branch	China
BNP Paribas	France
Société Générale (Canada Branch)	France
Maple Bank	Germany
Deutsche Bank AG	Germany

Table 3.3.3(b): Full Service Foreign Branches

Mizuho Corporate Bank ltd, Canada Branch	Japan
Rabobank Nederland	Netherlands
United Overseas Bank Limited	Singapore
UBS AG Canada Branch	Switzerland
First Commercial Bank	Taiwan
Barclays Bank Plc (Canada Branch)	UK
Royal bank of Scotland N.V., Canada Branch (The)	UK
Royal bank of Scotland Plc, Canada Branch (The)	UK
Bank of America, National Association	USA
Bank of New York Mellon (The)	USA
Capital One Bank (Canada Branch)	USA
Citibank, N.A.	USA
Comerica Bank	USA
Fifth Third Bank	USA
JPMorgan Chase Bank, National Association	USA
M&T Bank	USA
Northern Trust Company, Canada Branch (The)	USA
PNC Bank Canada Branch	USA
State Street	USA

Table 3.3.3(c): Full Service Foreign Branches

U.S Bank National Association	USA
Wells Fargo Bank, National Association, Canada Branch	USA

Source: The Office of the Superintendent of Financial Institutions, 2015.

- There are also three (3) foreign banks permitted to have branches and carry out banking activities in Canada. They are well-known as lending branches thus restricted from taking deposits or borrowing except from financial institutions. They include:-

Table 3.3.4: Lending Branches

BANK	PARENT COUNTRY
Crédit Agricole Corporate and Investment Bank (Canada Branch)	France
Credit Suisse AG, Toronto Branch	Switzerland
Union Bank, Canada Branch	USA

Source: The Office of the Superintendent of Financial Institutions, 2015.

3.4 Regulators of the Canadian Financial System

Canada has a competitive, sound, safe and most advanced financial systems in the world. All these are as a result of the regulatory bodies in Canada which work with the financial institutions to ensure there is continued stability and confidence in the system. In Canada, the financial system's regulation is a duty shared by the Department of Finance and other federal regulatory authorities which includes Bank of Canada, the Office of the Superintendent of Financial Institutions (OSFI),

Financial Consumer Agency of Canada (FCAC) and Canada Deposit Insurance Corporation (CDIC). Collectively, they form the Financial Institutions Supervisory Committee (FISC) which meets on a regular basis to discuss issues and share information with the federal government about the financial system of Canada.

3.4.1 The Office of the Superintendent of Financial Institutions (OSFI)

The OSFI was recognized in 1987, subject to federal oversight, it supervises and regulates financial institutions (banks, loan companies, insurers etcetera) federally registered. OSFI is responsible for;

- Monitoring the economic and financial environment to identify issues that affect financial institutions.

- Providing accounting and auditing standards.

- Providing input into developing and interpreting legislation and guidelines.

- Assessing the safety of financial institutions and pension plans.

3.4.2 Financial Consumer Agency of Canada (FCAC)

FCAC was established 2001 as an independent unit set out to enforce the protection of consumers while providing information to them on financial services and products. FCAC provides program to improve financial literacy and help consumers understand their rights when dealing with financial institutions. According to the Financial Consumer Agency of Canada Act, the FCAC has a dual mandate which compromises of the following main elements:-

- Ensuring and enforcing financial institutions federally regulated conform with intended guidelines, public obligations, as well as federal legislations and regulations.

- Increasing the financial literacy of consumers by educating or informing them of their duties and rights when dealing with financial institutions and payment card network operators.

3.4.3 Canada Deposit Insurance Corporation (CDIC)

CDIC is a federal crown corporation created March 1967 by the parliament. CDIC insures deposit held by financial institutions that are members for up to C$100,000. Although there have not been any failure of financial institutions in Canada since 1996, it is a measure taken to reduce bank run incase such occurs. CDIC do not protect deposits of foreign currency. To be qualified for protection of deposits, deposits must be made in Canada and in Canadian dollars.

CIDC was created to achieve the following:-

- Providing part or full insurance against loss of deposits.

- Minimizing loss and acting for the benefit of depositors.

- Promoting and contributing to the steadiness of Canada's financial system.

3.5 Canadian Banking Industry and Its Economy

The Canadian banking system contributes significantly to the well-being and growth of the Canadian economy. Banks are employers, principal tax payers and big buyers goods and services from Canadian suppliers. Canadians recognize the significance of the banking industry to the economy. Over 89% of Canadians believe the importance of a strong banking industry being able to compete both domestically (supporting Canadian businesses) and internationally.
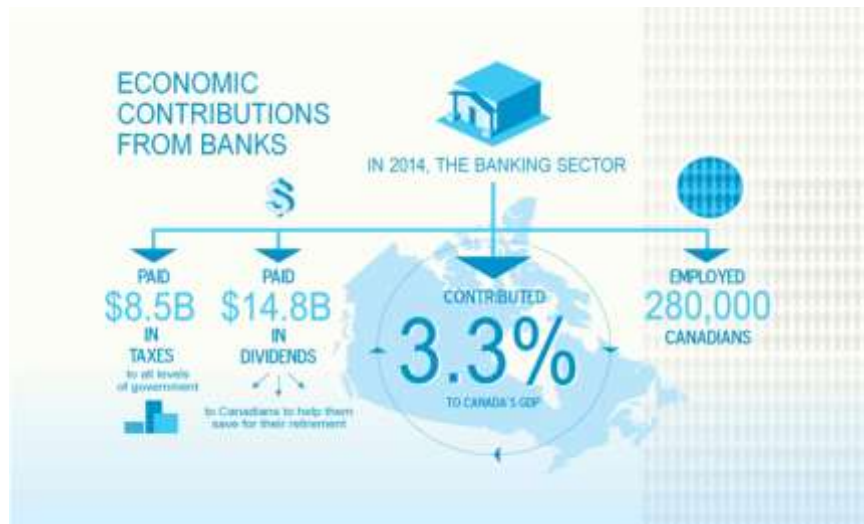
Figure 1: Economic Contributions from Banks.

Source: Canadians Bankers Association, 2014.

In 2014, Canada's banking system contributed 3.3% which is about $60 billion to Canada's GDP. The banking system is also a good corporate tax payer. The six largest banks in Canada paid $8.5 billion in taxes to the government. And about $14.8 billion was paid as dividends to Canadian shareholders. Banks together with other sources provided approximately 62.5% financing to small and medium sized enterprises. The industry also provides employment to Canadians and foreigners. Banks and subsidiaries employed 280,145 Canadians and has increased 26.9% in full-time industry employment over the past decade.

Chapter 4

DATA AND METHODOLOGY

4.1 Introduction

Research methodology describes the steps and processes followed by a researcher in carrying out a successful research work. It also deals with stating the plan structure and strategy of investigating such a research work.

4.2 Data

In this study, secondary data is the sole source of data used. The data of 8 top Canadian domestic chartered (Schedule I) banks were collected for this research over the period 2000-2015. The data utilized in this research were gotten via the yearly reports of individual banks and mostly from the Thomson Reuters data stream available at Eastern Mediterranean University.

The banks chosen for this study were based on two reasons. First it must be a domestic (Schedule I) bank and secondly, the asset size of the banks. Among them are the famous "Big Five" banks. Below is the list of the banks used in the study, ranked according to market capitalization and assets.

Table 4.2: Banks used in the Study

No	Bank Name	Also Known As	Market Cap (CAD)	Total Assets (CAD)	Total Deposits (CAD)	Net Income
1	Royal Bank of Canada	RBC	107,884,998, 000	1,072,136, 000,000	697,227, 000,000	9,734,000, 000
2	Toronto-Dominion Bank	TD	99,640,816, 000	1,102,442, 000,000	678,496, 000, 000	7,813,000, 000
3	Bank of Nova Scotia	Scotia bank	73,968,609, 000	854,463,0 00, 000	569,519, 000, 000	6,897,000, 000
4	Bank of Montreal	BMO	48,862,037, 000	638,719,0 00, 000	411,034, 000, 000	4,253,000, 000
5	Canadian Imperial Bank of Commerce	CIBC	39,840,348, 000	462,802,0 00, 000	366,657, 000, 000	3,531,000, 000
6	National Bank of Canada	NBC	14,605,705, 000	215,860,0 00, 000	128,830, 000, 000	1,504,000, 000
7	Laurentian Bank of Canada	LBC	1,533,832, 000	39,642,05 4, 000	26,604,3 04, 000	92,868,00 0
8	Canadian Western Bank	CWB	2,023,620, 000	22,811,11 0, 000	19,365,4 07, 000	319,701,0 00

Source: Author's Computation.

4.3 Variables

- **Return on Assets (ROA)**

Return on Assets depicts the profitability of an enterprise relative to its assets total. Return on Assets shows the management efficiency to generate earning using its assets. A high ROA shows extra earnings on less assets or investment, which is very good. It is calculated as

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$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

- **Return on Equity (ROE)**

This is another measure of financial performance. Return on Equity depicts a company's ability of turning the shareholders investments into wealth or profit. A high return on equity tells how good a company creates income from within. It is calculated as follows:-

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Total Shareholder's Equity}}$$

- **Non-performing Loan Ratio (NPLR)**

This is an important proxy of banks' credit risk. Non-performing loans depicts the level of default risk a bank sustains. Non-performing loans are the borrowed amount by which the borrower has not made principal and interest payments as scheduled. High ratio depicts high default risk.

$$\text{Non-performing ratio} = \frac{\text{Non-performing loans}}{\text{Total loans}}$$

- **Provision For Loan Losses Ratio (LLPR)**

Provision for loan losses is an expense that acts as a shock absorber for bad loans. Banks set aside this provision as a cover or precaution against impending loan losses. The higher the ratio, the more problematic are the loans. Thus calculated as

$$\text{Loan loss provision ratio} = \frac{\text{Loan loss provision}}{\text{Total loans}}$$

- **Loan to Deposit Ratio (LTDR)**

This is a liquidity measure. Loan to deposit ratio shows the ability of banks to meet short term liabilities while still willing to fulfill loan demands by the reduction of cash assets.

$$\text{Loans to deposit ratio} = \frac{\text{Total loans}}{\text{Total deposits}}$$

- **Loan to Asset Ratio (LTAR)**

This ratio measures bank assets rate raised to the general public as credit instrument. As it name implies, it is calculated simply by dividing total loans by total assets.

$$\text{Loans to asset ratio} = \frac{\text{Total loans}}{\text{Total assets}}$$

- **Cost per Loan Asset Ratio (CLAR)**

This measures the in customer loan distribution. Cost per loan asset is the monetary value of the average cost per loan advanced to customers. It is calculated as follows;

$$\text{Cost per loan asset ratio} = \frac{\text{operating expenses/costs}}{\text{Total loans}}$$

- **Total Debt to Asset Ratio (TDTAR)**

Total debt to asset ratio shows the proportion of assets total funded by debt. This is a financial leverage measure. Thus calculated

$$\text{Total debt to asset ratio} = \frac{\text{Total debts}}{\text{Total assets}}$$

4.4 Methodology

Panel data regression analysis will be used in this research. It is the pooling or mixture of both cross sectional and time series data. The panel data regression analysis will be done with the use of Econometric views (E-views) statistical software. Accordingly, contrasted to typical time series or cross sectional data, one of the benefits of panel data is that it gives less relationship between variables, more variability, efficacy, degrees of freedom and provides more information.

The general form for panel regression is:-

$Y_{it} = \beta_0 + \beta X_{it} + U_{it}$

Where Y_{it} denotes dependent variable, β_0 symbolizes intercept or constant, βX_{it} represents coefficient of independent variables, U_{it} signifies error term while i and t denotes cross sections and time respectively.

4.4.1 Model Specifications

The analyses of this study will be based on the following regression equations:

Model I

$ROA_{it} = f (NPLR_{it}, LLPR_{it}, LTDR_{it}, LTAR_{it}, CLAR_{it}, TDTAR_{it})$

$ROA_{it} = \beta_0 + \beta_1 \, NPLR_{it} + \beta_2 LLPR_{it} + \beta_3 LTDR_{it} + \beta_4 LTAR_{it} + \beta_5 \, CLAR_{it} + \beta_6 TDTAR_{it} + u_{it}$

Model II

$ROE_{it} = f (NPLR_{it}, LLPR_{it}, LTDR_{it}, LTAR_{it}, CLAR_{it}, TDTAR_{it})$

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$$\text{ROE}_{it}= \beta_0 +\beta_1 NPLR_{it} +\beta_2 LLPR_{it} +\beta_3 LTDR_{it} +\beta_4 LTAR_{it}+\beta_5 CLAR_{it}+\beta_6 TDTAR_{it}+u_{it}$$

Where ROA (Return on Assets) and ROE (Return on Equity) serves as a proxies for banks' financial performance, while the regressors or independent variables represents non-performing loans ratio, loan loss provision ratio, loan to deposit ratio, loan to asset ratio, cost per loan assets and debt to asset ratio respectively serve as proxies for credit risk.

4.4.2 Hausman Test

Panel data analysis consists of two main techniques namely: the fixed effect method and the random effect model. Hausman test was performed to know the appropriate model to use for the analysis, whereas likelihood ratio was used to confirm the results of hausman test which agreed to fixed effect been the appropriate for both models, so therefore is used for the analyses.

The fixed effect equation for the analysis is as follows:

$$Y_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \alpha_4 D_{4i} + \alpha_5 D_{5i} + \alpha_6 D_{6i}+ \alpha_7 D_{7i} + \alpha_8 D_{8i} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + u_{it}$$

Where D represents dummy variables, α signifies the intercept for each bank and βX_{it} denotes coefficients of the independent variables.

Fixed effect assumes one true effect underlies all studies and differences are due to chance or sampling error. Fixed effect model ignores heterogeneity and also has a narrower confidence interval.

4.4.3 Unit Root Tests

Before the regression is done, we have to check for the stationarity in variables. Stationarity is taking into account the stochastic properties of the variables, which is constant mean, variance and covariance overtime. Stationarity will be confirmed by the use of panel unit root tests. E-views provides five tests in which we use for unit root testing and all are considered in this research. They are LLC test (Levin, Lin and Chu, 2002), Breitung (2000) test, IPS test (Im, Pesaran and Shin test, 2003), ADF test (Augumented Dickey Fuller, 1981) and PP test (Phillips Perron, 1988) respectively. According to Ramirez (2007), the enhancement of information in the time series by the information of cross sectional data, makes panel unit root tests to be more efficient than that of unit roots on distinct series. He also stated that there is an indistinguishable unit root procedure over cross-segments among tests mentioned above with the exclusion of IPS test.

The broad structure used by most panel unit root processes is:

$$\Delta Y_{it} = \propto y_{it-1} + \sum \beta_{ij} \Delta y_{it-j} + X_{it}\delta + v_{it}$$

Where y_{it} is the combined variable, X_{it} denotes the banks fixed effects and specific time trends, v_{it} represents error term.

The hypotheses for the aforementioned test are same. It is:

H_O: The variable has unit root

H_1: The variable does not have unit root

4.4.4 Diagnostic Test Procedures

Finally, in other to be sure of achieving valid results, the test for multicollinearity, heteroscedasticity and autocorrelation which are fundamental assumptions of ordinary least squares need to be implemented. If any of this is present, the estimators will no longer be best or efficient, which will lead to false regression

results. In this study, Pearson's correlation matrix was used to check for multicollinearity, Glejser test was used to detect heteroscedasticity and Durbin-watson was used to detect autocorrelation.

Chapter 5

EMPIRICAL ANALYSIS

5.1 Unit Root Testing

Unit root testing is the first procedure to perform before doing an analysis. This is to check if the variables to be used are stationary in other words if they are integrated at level 0 (I(0)). Stationarity implies constant mean, variance and covariance overtime. And only if stationarity in the data series have been confirmed, regression analysis can follow. But if the data series are confirmed to be non-stationary, then cointegration will be applied to check for long run relationship of the variables.

This study will be using the following tests to check for stationarity in the variables to be used; Levin, Lin and Chu (LLC), Breitung test, Im, Pesaran and Shin (IPS), Augmented Dickey Fuller (ADF) and Phillips Perron.

The hypotheses to be used for the panel unit root tests mentioned above are as follows:

H_0: The variable has unit root (Non-stationary)

$H_{1:}$ The variable does not have unit root (Stationary)

Table 5.1(a): Panel Unit Root Test

ROA	LLC	Breitung test	IPS	ADF	PP
τ_T	-1.79798**	-1.76784**	-1.88602**	25.4533***	28.3279**
τ,	-3.31165*	-	-3.00553*	35.6685*	32.0714*
T	-0.31344	-	-	9.20585	13.1001

ROE	LLC	Breitung test	IPS	ADF	PP
τ_T	-3.55947*	-2.46739*	-2.70081*	32.0566*	29.4104***
τ,	-3.10228*	-	-3.26257*	36.8229*	36.1831*
T	-1.18961	-	-	11.8522	16.4454

NPLR	LLC	Breitung test	IPS	ADF	PP
τ_T	-3.55757*	-1.35201***	-2.39804*	31.0655**	11.1267
τ,	-2.19340**	-	-1.66136**	26.2015***	21.4975
T	-1.10095	-	-	12.8138	12.3604

LLPR	LLC	Breitung test	IPS	ADF	PP
τ_T	-3.44846*	-5.11731*	-1.87841**	25.1852***	30.3015**
τ,	-3.69255*	-	-2.68010*	31.9911**	22.7638
T	-2.58066*	-	-	33.4742*	27.7914**

LTDR	LLC	Breitung test	IPS	ADF	PP
τ_T	-6.85797*	-1.15011	-3.96542*	44.4732*	46.3121*
τ,	-5.36128*	-	-3.53081*	43.7653*	42.9636*
T	2.65542	-	-	10.0060	11.7505

Table 5.1(b): Panel Unit Root Test

LTAR	LLC	Breitung test	IPS	ADF	PP
τ_T	-2.88064*	0.73957	-1.24078	25.7863***	39.4262*
τ,	-2.58903*	-	-2.13856**	30.4765**	35.5916*
T	-0.79517	-	-	12.7948	13.6884

CLAR	LLC	Breitung test	IPS	ADF	PP
τ_T	-2.41788*	-3.12837*	-3.03288*	34.6161*	23.1167
τ,	-1.23788	-	1.00702	9.66077	0.9536
T	-5.80009*	-	-	51.6053*	59.9221*

TDTAR	LLC	Breitung test	IPS	ADF	PP
τ_T	-4.36371*	1.34407	-2.94182*	37.1164*	37.8145*
τ,	-4.12133*	-	-3.33975*	42.4251*	39.7041*
T	-1.29465***	-	-	15.6246	15.2484

Where τ_T denotes the model with intercept and trend, τ, denotes model with intercept only and τ shows the model without trend and intercept. Whereas *, ** and *** represents the level of significance at 1%, 5% and 10% respectively.

From the above results, most of the tests show to be statistically significant as the prob values < 10% significance level. Therefore the null hypothesis is rejected and the series used in the study are stationary. In other words, regression analysis can be undertaken.

5.2 Multicollinearity

After confirming stationarity in the series, the next step is to make sure that the fundamental assumptions of ordinary least squares are adhered to so as to achieve genuine results. One of the assumptions of ordinary least square is "No multicollinearity among independent variables". Multicollinearity is the linear correlation between regressors. In this study, Pearson's correlation matrix is used as a tool to identify multicollinearity. It is known that there is always a relationship (no matter how small) among variables but the degree at which they are correlated matters.

Correlation coefficient symbolized as "r" tells the trend and linear connection between two variables and its value ranges between -1 to +1. The relationship existing between variables can be negative or positive.

A correlation coefficient (r) of +1 tells the presence of a perfect positive relationship, (r) of -1 shows a perfect negative relationship and when (r) is 0, it signifies no relationship between variables. As earlier stated, there is always an existing relationship among variables but what counts is the degree at which they are related. According to Farrar and Glauber (1967), the relationship between independent variables is to be constrained to be less than 0.8 or 0.9. A correlation coefficient between 0.9 and 1 or -0.9 to -1 is said to be very high, thereby signaling the presence of multicollinearity. A correlation coefficient between 0 to 0.50 or -0.50 and 0 shows a positively or negatively weak relationship between variables respectively. Whereas, if the value ranges between 0.50 to 0.90 or -0.90 and -0.50 then it is said that the variables have positive or negative strong relationships respectively.

The easiest and informal way to detect multicollinearity is by looking at the R^2 and t-ratios after running the regression. If the R^2 is high and the t-ratios are insignificant, then there is a chance that multicollinearity is present.

Below is the representation of the matrix table that displays the correlation analysis result.

Table 5.2: Correlation Coefficient of Variables

	NPLR	LLPR	LTDR	LTAR	CLAR	TDTAR
NPLR	1.0000					
LLPR	0.0415	1.0000				
LTDR	0.1049	-0.2708	1.0000			
LTAR	0.1311	-0.2501	0.8197	1.0000		
CLAR	-0.3379	-0.1978	-0.5362	-0.5250	1.0000	
TDTAR	-0.0941	0.3931	0.1133	-0.3755	0.05218	1.0000

According to the above results, it is clear to see that there is no high relationship between explanatory variables to cause the problem of multicollinearity. This concludes that there is no multicollinearity and the analyses can be continued.

5.3 Hausman Test

In panel data regression analysis, there are two types of models namely Fixed effect model and Random effect model. In other to know the preferred or appropriate model a particular analysis, Hausman test has to be carried out.

The hypothesis of the Hausman test is as follows:

$H_{0:}$ Random Effect is appropriate.

H$_{1:}$ Random Effect is not appropriate.

Table 5.3.1: Hausman Test Result for Model I (ROA)

Test Summary	Chi-Sq Statistic	Chi-Sq. d.f	Prob.
Cross-section random	55.900559	6	0.0000

Table 5.3.2: Hausman Test Result for Model II (ROE)

Test Summary	Chi-Sq Statistic	Chi-Sq. d.f	Prob.
Cross-section random	39.811540	6	0.0000

Since the p-values for both models (0.0000) obtained are less than 10% significant level, we therefore reject the null hypothesis. Therefore concluding that random effect model is not appropriate for the analyses.

5.4 Likelihood Ratio Test

This is more of a confirmation test. Likelihood ratio test is used to confirm the Hausman test which according to the result above, state fixed effect is appropriate for both analyses.

The hypothesis of the Likelihood ratio test is as follows:

H$_{0:}$ Fixed Effect is not appropriate.

H$_{1:}$ Fixed Effect is appropriate

Table 5.4.1: Likelihood Ratio Result for Model I (ROA)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	11.861838	(7,114)	0.0000
Cross-section Chi-square	70.038028	7	0.0000

Table 5.4.2: Likelihood Ratio Result for Model II (ROE)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.718220	(7,114)	0.0000
Cross-section Chi-square	38.519419	7	0.0000

From the above results, the prob values are less than 10% significance level. So therefore, the likelihood ratio confirms the result of the hausman test which concludes that fixed effect is appropriate for the analyses of both models.

5.5 Autocorrelation

This is another fundamental assumption to look out for. Assumption five states that "there should be no autocorrelation between disturbances". It is also known as serial correlation. If autocorrelation is present, the estimators will be linear and unbiased but no longer best or efficient. In this study, Durbin-watson test will be used to verify if autocorrelation is present or not. The Durbin-watson denoted as (d) values ranges between 0 to 4. A value close 0 represents a positive correlation, a value close to 4 represents a negative correlation and a value close to 2 signifies no autocorrelation present.

According to results; the "d" for model I and model II are 1.98 and 2.06 respectively, number of observations = 128, number of independent variables = 6, d_L = 1.535 and d_u = 1.802.

Table 5.5: Autocorrelation Decision Table

Null Hypothesis	Decision	If
No autocorrelation	Do not reject	$D_u < d < 4-d_u$
No negative autocorrelation	Reject	$4-d_L < d < 4$
No negative autocorrelation	No decision	$4-d_u \leq d \leq 4-d_L$
No positive autocorrelation	Reject	$0 < d < d_L$
No positive autocorrelation	No decision	$d_L \leq d \leq d_u$

Since $1.802 < 1.98 < 2.198$ and $1.802 < 2.06 < 2.198$ at 5% level of significance, then we failed to reject the null hypotheses. Therefore there is no autocorrelation present in both models.

5.6 Heteroscedasticity

The assumption four of the ordinary least square states "there should be homoscedasticity of disturbances" which means there should be equal variance of U_i. Heteroscedasticity is the unequal variance of error term. In this study, Glejser test will be used to check for heteroscedasticity. If heteroscedasticity is present, the standard errors gotten cannot be trusted, which leads to wrong t-ratios, meaning the estimators are not efficient or best.

Glejser test equation for my model is

Abs(resid01)=

$\beta_0+\beta_1(NPLR)i,t+\beta_2(LLPR)i,t+\beta_3(LTDR)i,t+\beta_4(LTAR)i,t+\beta_5(CLA)i,t+\beta_6(TDTAR)i,t$

$+\varepsilon t$.

H_0: Homoscedasticity

H_1: Heteroscedasticity

From the results for both models, one of the variables (CLA) has a p-value of 0.0015 and 0.0073 respectively, which is less than 10% significance level. This means the rejection of the null hypothesis. There is heteroscedasticity present.

With this found, we then solved the problem using white heteroscedasticity consistent standard errors (white period) when performing the regression analyses and found significant changes in the standard errors and t-ratios. Making the standard errors to be trusted and t-ratios to be asymptotically standard normally distributed, thereby leading to correct p-values. In short, the results gotten after performing the white test are genuine and the estimators are BLUE.

5.7 Regression Analyses

After performing all relevant tests and solved the problem of heteroscedasticity encountered, knowing my results are in line with the assumptions and are genuine, we then proceed with the interpretation of the analyses.

Table 5.7.1: Regression Analysis Output for ROA (Model I)

Variable	Coefficient	Std. Error	T-statistic	Prob
C	0.684475	0.125473	5.455177	0.0000
NPLR	-0.061222	0.027765	-2.204978	0.0295
LLPR	-0.262432	0.021884	-11.99203	0.0000
LTDR	-0.005817	0.003140	-1.852387	0.0666
LTAR	0.012789	0.002473	5.171573	0.0000

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CLA	-0.019636	0.007482	-2.624585	0.0099
TDTAR	0.002831	0.005453	0.519184	0.6046

Effects Specification				
Cross-section fixed (dummy variables)				

R-squared	0.580037	Mean dependent var	0.686641
Adjusted R-squared	0.532147	S.D. dependent var	0.265710
S.E of regression	0.181745	AIC	-0.469502
Sum squared resid	3.765577	Schz. criterion	-0.157561
Log likelihood	44.04813	Hannan-Quinn criter.	-0.342759
F- statistic	12.11174	Durbin-Watson stat	1.989590
Prob(F-statistic)	0.000000		

Table 5.7.2: Regression Analysis Output for ROE (Model II)

Variable	Coefficient	Std. Error	T-statistic	Prob
C	9.175246	3.153280	2.909746	0.0044
NPLR	-1.034391	0.566925	-1.824566	0.0707
LLPR	-7.035470	0.635465	-11.07138	0.0000
LTDR	-0.092358	0.065162	-1.417363	0.1591
LTAR	0.233418	0.103407	2.257273	0.0259
CLA	0.058623	0.183701	0.319170	0.7502
TDTAR	0.064839	0.102884	0.630219	0.5298

Effects Specification				
Cross-section fixed (dummy variables)				

R-squared	0.427921	Mean dependent var	12.93898
Adjusted R-squared	0.362684	S.D. dependent var	5.010116
S.E of regression	3.999680	Akaike info criterion	5.713224
Sum squared resid	1823.708	Schwarz criterion	6.025165
Log likelihood	-351.6463	Hannan-Quinn criter.	5.839967
F-statistic	6.559474	Durbin-Watson stat	2.065512
Prob(F-statistic)	0.000000		

5.7.1 Model I :- Interpretation of results

From the above results, the R^2 is 0.58, which means that 58% of the total variation of Return on Assets is explained by the model. And the F-prob (0.0000) shows that the model is jointly statistically significant at 10% significance level.

The intercept is 0.684475, which means that when the independent variables (NPLR, LLPR, LTDR, LTAR, CLAR and TDTAR) are zero, return on assets (ROA) is 0.68%.

Non-performing Loan Ratio

Non-performing loan ratio is statistically significant at 10% level of significance. The slope coefficient of NPLR is -0.061222, which means that a 1% increase in non-performing loan ratio will cause a decrease in Canadian banks' return on assets by 0.06% holding the other independent variables constant. This conforms to previous studies like Poudel (2012), Kolapo, Ayeni and Oke (2012) and Mushtaq, Ismail and Hanif (2015).

Loan Loss Provision Ratio

Loan loss provision ratio is statistically significant at 10% level of significance. Its slope coefficient is -0.262432, which tells that a 1% increase in loan loss provision causes Canadian banks' return on assets to decrease by 0.26% holding other independent variables constant. This follows the result of Kolapo, Ayeni and Oke (2012).

Loan to Debt Ratio

Loan to debt ratio is statistically significant at 10% level of significance. The slope coefficient of LTDR is -0.005817, which means that a 1% increase in the loans to debt ratio will cause the return on assets of Canadian banks to decrease by 0.005% holding other independent variables constant. This result depicts that of Mushtaq, Ismail and Hanif (2015) but is in contrast to Kolapo, Ayeni and Oke (2012).

Loan to Asset Ratio

Loan to asset ratio is statistically significant at 10% significance level. The slope coefficient of LTAR is 0.012789, which tells that when loans to asset ratio goes up by 1%, return on assets of Canadian banks goes up by 0.012% holding other independent variables constant.

Cost per Loan Asset Ratio

Cost per loan asset ratio is statistically significant at 10% level of significance. The slope coefficient of CLAR is -0.019636. This tells that a 1% increase in cost per loan asset ratio will cause return on assets of Canadian banks to decrease by 0.019% holding other independent variables constant. This is consistent with the result of Mushtaq, Ismail and Hanif (2015). Poudel (2012) got the same negative sign but it was insignificant.

Total Debt to Asset Ratio

Total debt to asset ratio is not statistically significant at 10% significance level. This is a result in contrast to that of Mushtaq, Ismail and Hanif (2015) which found it to have a negative correlation to ROA and was statistically significant.

5.7.2 Model II:- Interpretation of results

The regression output of ROE showed an R^2 of 0.4279 which means that approximately 43% of the total variation of ROE is explained by the model. And the F-prob of 0.0000 means that the model is jointly statistically significant at 10% level of significance.

The intercept of 9.175246 signifies when the regressors or independent variables are zero, ROE will be 9.17%.

Non-performing Loans Ratio

Non-performing loan ratio is statistically significant at 10% level of significance. Its slope coefficient is-1.034391, which means that 1% increase in non-performing loans will cause a decrease of 1.03% in the return of equity of Canadian banks on average. Although this result is similar to that of ROA, the influence of NPLR on ROE is greater as shown by the coefficients. This result complies with that of Gizaw et al. (2015) but is in contrast with that of Boahene et al (2012) which found that the ratio of non-performing loans positively affects ROE and Abbas et al. (2014) which found it to be insignificant.

Loan Loss Provision Ratio

Loan loss provision ratio is statistically significant at 10% level of significance. The coefficient of -7.035470 means that a 1% increase in loan loss provision will cause Canadian banks ROE to decrease by 7.03% on average. This conforms with the findings of Abbas et al. (2014) but in disparity with Gizaw et al. (2015).

Loan to Deposit Ratio

Loan to deposit ratio is not statistically significant at 10% level of significance. This result means that loan to deposit ratio does not have an effect on ROE. The result is in accordance with Abbas et al. (2014).

Loan to Asset Ratio

Loan to asset ratio is statistically significant at 10% significance level. Its coefficient of 0.233418 means that a 1% increase in loan to deposit ratio will cause Canadian banks ROE do increase by 0.23% on average.

Cost per Loan Asset Ratio

Cost per loan asset ratio is not statistically significant at 10% level of significance.

Total Debt to Total Asset Ratio

Total debt to asset ratio is not statistically significant at 10% level of significance.

Chapter 6

CONCLUSION AND POLICY RECOMMENDATION

It is well known that credit risk is the most significant risk in banks as banks' credit constitute the most essential source of income to banks. Based on the evidence of the empirical findings provided by this study, it shows credit risk inversely affects banks' financial performance and therefore illustrates the relevance of good credit management on financial performance of banks.

From the results, although the return on assets (ROA) of Canadian banks had more credit risk proxies affecting it, the magnitude to which the credit risk proxies affect the return on equity (ROE) of Canadian banks was higher. The results of this study conforms to researches done by Kargi (2011), Poudel (2012), Kaaya and Pastory (2013), Abbas et al. (2014), Mushtaq et al. (2015), Abbas et al. (2014) among others which concludes to the inverse relationship between credit risk and financial performance of banks.

I recommend that the Bank of Canada and other stakeholders should implement stringent credit management policies in order to improve financial performance which in turn stimulates economic growth.

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APPENDICES

Appendix A: Regression Result for ROA

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/03/16   Time: 17:20
Sample: 2000 2015
Periods included: 16
Cross-sections included: 8
Total panel (balanced) observations: 128
White period standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.684475	0.125473	5.455177	0.0000
NPLR	-0.061222	0.027765	-2.204978	0.0295
LLPR	-0.262432	0.021884	-11.99203	0.0000
LTDR	-0.005817	0.003140	-1.852387	0.0666
LTAR	0.012789	0.002473	5.171573	0.0000
CLA	-0.019636	0.007482	-2.624585	0.0099
TDTAR	0.002831	0.005453	0.519184	0.6046

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.580037	Mean dependent var		0.686641
Adjusted R-squared	0.532147	S.D. dependent var		0.265710
S.E. of regression	0.181745	Akaike info criterion		-0.469502
Sum squared resid	3.765577	Schwarz criterion		-0.157561
Log likelihood	44.04813	Hannan-Quinn criter.		-0.342759
F-statistic	12.11174	Durbin-Watson stat		1.989590
Prob(F-statistic)	0.000000			

Appendix B: Regression Result for ROE

Dependent Variable: ROE
Method: Panel Least Squares
Date: 07/03/16   Time: 17:39
Sample: 2000 2015
Periods included: 16
Cross-sections included: 8
Total panel (balanced) observations: 128
White period standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.175246	3.153280	2.909746	0.0044
NPLR	-1.034391	0.566925	-1.824566	0.0707
LLPR	-7.035470	0.635465	-11.07138	0.0000
LTDR	-0.092358	0.065162	-1.417363	0.1591
LTAR	0.233418	0.103407	2.257273	0.0259
CLA	0.058632	0.183701	0.319170	0.7502
TDTAR	0.064839	0.102884	0.630219	0.5298

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.427921	Mean dependent var	12.93898
Adjusted R-squared	0.362684	S.D. dependent var	5.010116
S.E. of regression	3.999680	Akaike info criterion	5.713224
Sum squared resid	1823.708	Schwarz criterion	6.025165
Log likelihood	-351.6463	Hannan-Quinn criter.	5.839967
F-statistic	6.559474	Durbin-Watson stat	2.065512
Prob(F-statistic)	0.000000		

Appendix C: Correlation Matrix

	NPLR	LLPR	LTDR	LTAR	CLA	TDTAR
NPLR	1.000000	0.041538	0.104912	0.131140	-0.337900	-0.094123
LLPR	0.041538	1.000000	-0.270831	-0.250174	0.393114	-0.035981
LTDR	0.104912	-0.270831	1.000000	0.819774	-0.536279	0.113319
LTAR	0.131140	-0.250174	0.819774	1.000000	-0.525075	-0.375585
CLA	-0.337900	0.393114	-0.536279	-0.525075	1.000000	0.052118
TDTAR	-0.094123	-0.035981	0.113319	-0.375585	0.052118	1.000000