CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, ISLAMABAD

Product Diversification and Bank Risk Evidence from South Asian Banking Institutions

by

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A thesis submitted in partial fulfillment for the
degree of Master of Science

in the
Faculty of Management & Social Sciences
Department of Management Sciences

2020

I want to dedicated this work to my beloved parents, teachers and friends whose support me and encourage me in crucial time

CERTIFICATE OF APPROVAL

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Acknowledgements

Abstract

This study investigates whether the product diversification activities of South Asian banking institutions have led to an increase or decrease in their solvency and profit risk. Study used the data of four countries Pakistan, Iran, India, Nepal for the year 2000-2014. Study analysis shows the effect of both income and asset diversification activities on the standard deviation (SDs) of return on equity (ROE) and return on asset (ROA). The study used panel data approach to investigate product diversification and bank risk of south Asian countries. The independent variable of product diversification is income diversification and asset diversification. Study further divide income diversification to fee and commission, other income, interest income and non-interest income. While in asset diversification to loan to asset, other loan to asset, equity to asset, and nature logarithm of asset. Dependent variable is standard deviation of return on equity (SROE) and standard deviation return on asset (SROA). The data is collect from annual reports of south Asian Banks, The panel data regression technique has been used with different test such as common, fixed and random effect model and the study is apply fixed effect model for final interpretation with recommendation of Hausman and likelihood test. The findings of this study has important implication for manager and regulators in the banking industry in south Asian and other developing countries.

Keywords: Bank Risk, Interest Income, Non-Interest Income, Product Diversification, South Asian Banks.

Contents

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Abbreviations

ADB	Asian Development Bank
EA	Equity to Asset
FCTI	Fee and Commission to Total Income
GFC	Global Financial Crisis
IMF	International Monetary Fund
IITI	Interest Income to Total Income
LA	Loan to Asset
NITI	Non-Interest Income to Total Income
NLTA	Natural Logarithm of Total Asset
OITI	Other Income to Total Income
OLTA	Other Loan to Total Asset
SAARC	South Asian Association Regional Country
SDROA	Standard Deviation Return on Asset
SDROE	Standard Deviation Return on Equity

Chapter 1

Introduction

1.1 Background of the Study

From 2017 the South Asian bank have maintained the steady growth rate of 7 percent. World Bank report has stated that the south Asia is going to be economic hub in the coming years and will maintain this status by the year of 2019 and 2020 and forecasted the annual growth rate to be around 7.1% (www.world bank.org). This trend in the growth rate is due to the economic revaluation by introducing the open market policies by countries in the region. DE regularization of economic marketplace takes a backbone character during the present course. Sources from global economic market similar the World Bank and International Monetary Fund (IMF), the Asian Development Bank (ABD) to generate a competitive financial services industry the South Asian has been busy in a process of pull apart their monitoring structure since 1980s.

As a perception in various economic developing nations in which south Asian government plays a vital role during the regulating the economic and financial activities. The government influence and the post-deregulatory situation have providing the chances towards the economic organization, particularly banks and are offering long list products to their customers. Due to these activities, the banking industry has brought the major modifications in their business model. The operational

banks within the region have tremendously reshaped their activities from the basic functions such as deposit taking & loan providing institution to well-diversified financial services offering industry. Their range of products includes many new innovative banking product and other fund generating including activities (such as insurance, financial planning, consumer banking, mutual fund and securities trading). This compatibility of the banks to justify for the variety of products to all customers has been accomplished due to the modern day technology gadgets. Some studies have disapproved the linkage diversification of product efforts in Banks south Asian in non-regulatory age has a risk. In study investigate product diversification effect on asset and income of bank on the Bank lending (South Asian). So the product is diversified in to two broad areas one is Herfindahl-Hirschman Index (HHI): diversification for income (HHI income) and diversification for asset (HHI asset). According to DeYoung and Torna (2013) in their research showed that performance of bank studies should separation in the bank businesses by type of their product line slightly than grouping motion only toward to Non interest income variables or else a activities about the one time balance sheet .

Diversification means that the performance of increasing the origin of market in any product. The diversification strategy is used to expanding the sale connected with an existing product line, which is particularly useful for a business that has been experiencing stagnant or declining sales. A common approach toward diversification is risk reduction or volatility by putting your investment in different type of asset.

The bank diversified offering portfolio for product to its customers benefit are unresolved interrogation. whereas here remains about confirmation toward recommend for Banks statement a presentation improving such as an effect of expanding their business through non-traditional activities, a lot of research influence to discover that implementation improving have being connected along boost in Bank risk. (perceive, for instance, (Baele, De Jonghe, & Vander Vennet, 2007; De Jonghe, 2010; Demsetz & Strahan, 1997; DeYoung & Torna, 2013; Kwast, 1989; Stiroh & Rumble, 2006; Williams, 2016). The negative effect of diversification found on

the market clue of Bank there by raising implication for Bank solvency (Laeven & Levine, 2007). The disagreement for increasing risk for bank which diversified Bank are probable have being further unprotected to change in economic and market wide factors (Baele et al., 2007).

An environment of non-regulatory bodies may encourage to engage banks in unreasonable off balance sheet activities and non-traditional activities for the creation of its revenue and extra flow showing towards fluctuation with in regional, household also worldwide market economy large factors. Bank risk and off-balance activities has positive association after Banks diversified its by-product portfolio during deregulated (Haq & Heaney, 2012). Although the Banks diversified have being unprotected toward additional levels of risk of market (Shavdatuashivili 2017).

This is the appearance of the Global Financial Crisis (GFC) be able to be copied towards the liberalized environment shaped through deregulation of economic. (DeYoung & Torna, 2013) argue that a lot of reviewers locate the responsibility on behalf of the non-systematic bank miscarriage happen for the duration of the GFC continuously existing variations in bank instruction that acceptable banks to connect further liberally in non-traditional events. For more risky trading activities the European Union remains development toward enclose their consequence activities of taking deposit to shields the particular deposits since the probable lateral effect. The diversification of product and its associated risk in a liberalized environment remains mostly applicable toward south Asian bank for example they challenge to deal non-traditional facilities toward a measureless unbanked population through small stage of financial literateness who largely survive in countryside zones.

1.2 A Key Term Definition

1.2.1 Profit Risk

Profit risk deals with the firm's income statement and if the company income

statement is focused on the specific area than there is a risk to the profit.it is a product of the financial services industry, and it also includes the other risk management methods mostly used in the financial services industry and work in line with the other risk management measures.

If a company is dealing with the limited number of customer's accounts or their products then this can in return result in a disaster meaning that losing a limited number of products or customer would result in losing a huge chunk of revenue. The concept of the profit risk can be related to the renowned 80/20 principle it means that the 80% of the business revenue come from the 20 % of its customers. And now this principle has become outdated. Because in the financial service industry there are the real world examples where the financial institutions have a profit ratio of as high as 300 percent and there 10 percent of customer have contributed more than three times of their earing.

1.2.2   Solvency Risk

Solvency is the company's capability to fulfill long-term financial commitments. It is an important component to stay in the trading and its ability to continue its operations in the future ahead. It is one of the most important components for in the business and be competitive in the market. The business is considered to be the solvent if their net worth is positive. The business assets should be must greater than the business liabilities. The solvency ratio evaluates the firm's actual cash flow rather than net profit by increase the back depreciation and other non-cash expenses to evaluate the firm position to stay afloat.

1.3   Nature Changes of South Asian Banking Industry

South Asia has no specified geographically boundary; Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka are mostly called South Asian countries. In 1985 SAARC (south Asian association regional country) formed these countries.

The main objective which is promote corporation between member nations in different social, economic etc. Starting from late 1980, various countries of south Asian employed programmers of liberalization of economic and deregulation of financial with main objective is opportunities for economies toward the foreign and domestic of private sector, improving the participation of banking and financial market and services business by accomplishing the needed economic growth. Such like these steps have resulted in boosting of inflow of capital from foreign, private sector expansion and also development of economic. On behalf of study point of view correlated through the year completion in 1995, spectacular two years completion in 2005 and 2015 has shown an increased in South Asian of 318% and 1177% respectively 740% and 4611% respectively due to investment through foreign (Equity flow of foreign portfolio). The annually growth ratio of economic during the region in the recent years average of 7%. Expressive contribution of private section within financial activities has improved, whereas industry of banks and capital markets played the role of a back bone in developing in economic. The recent expansion of the financial sector, followed by the establishment about improvements of deregulatory is a main contributing element in the extraordinary ratio of financial development attained through economies of South Asian (Ahmed & Ansari, 1998).

The banking industries are deeply disciplined through state-owned banks. South Asia does not exclude from the previous experience toward the accomplishment of polices of deregulation financial, control the banking sectors in the country by means of state-owned activity. On behalf of exemplar, prior 1990, in these region state owned were under control by the follow approx. percentage 93% of Bangladesh, 99% of Bhutan, 88% of India, 97% of Maldives, 96% of Nepal, 94% of Pakistan, and 80% of Sri Lanka banking activities in the region of south Asian countries.

Banks institution has an opportunity to their customer's delivery a wide array of financial services due to changes in regulatory (Baele et al., 2007). Fairly than upholding a slight focus on financing funds (commercial loans) or contemporary-day banks look for to business activities to diversify across arrange of activities

(Edirisuriya, Gunasekarage, & Dempsey, 2015) .The banks of South Asian like ICICI Bank of India, AB Bank of Bangladesh, Silk Bank of Pakistan and Commercial Bank of Siri Lanka following this approach in the private sector banks in 2016 and made their income 25 to 74% from non-interest income sources. This is due to south Asian banks outreach programs and use of modern financial technology and offering and promoting wide array of financial solution has gathered millions of unbanked customer. These outreach programs have be easy due to the worldwide approach on the way to modern tools of telecommunication arranged through the people in the zone. Like ICIC Bank which is the private bank of India has reports in 2013 that 60% of transaction of their saving account done by the mobile and internet banking after introducing of these technologies.

Due to this 4.2 million banks account has been opened by tab banking. According to the World Bank, mobile cellular sub-scrimptions from 2000 to has grown from 0.33 per 100 people to 77.64 per 100 people in south Asian region, while the percentage of the internet usage also grew from 0.47% to 23.63% during the same period. The diversified financial solution offering by bank that can variety usage of the accessed information over lending relation to deliver other financial services proficiently and effectively, and vice versa (Baele et al., 2007). This proof shows that bank south Asian have complete use of voices to their customer and this has resulted in improved performances. On behalf of the duration of between 1998 and 2015, Bangladesh, Indian, Sri Lanka, and Pakistan bank have tremendously lessened the ratio of 77%, 63%, 45%, and 81%, respectively of their non-performance loans.

1.4 Theoretical Background

The difference shown as greatly regarding the merit of corporate diversification by the opinion of manger, creditors, and stockholder. For example if the manager aim is to attain diversification to reduce the specific risk that can have an impact on the future reimbursement. Similarly the lender goal is to diversify investment

to decrease the probability of a slope in cash streams that could have drastic effect for the firms in terms of repayment of loans. At the same time, stockholder of the firms may not want the firm to diversify if more cheaply alternatives are available for the individual investment portfolios. So we can agree with diversified stockholder. So this discussion means that the firm's stakeholders may find diversification sometimes necessary or (unnecessary).

1.4.1 Why Diversify

There are three motives which are used diversification : agency theory, the resource based view, and market power (Montgomery, 1994). As form agency theory, the diversification is an outcome of the managerial self-interest at the account of stockholders. Managers opt to diversify because the outcome will be either (1) increased personal gains (Jensen & Murphy, 1990)or authority in the office (Jensen, 1986); (2) To become more secured in the firm (for example entrench themselves) by making investments such as manager centered investments ; or (3) Reducing the risk to their individual investment portfolio as well as firm risk since the executives are subject to their own risk by diversifying portfolio (Amihud & Lev, 1981).

Regarding to the bird eye view of the resource-based motive, we must look at diversification in firm that has a potential in source and abilities and can be transferred between industries. At this point we are considering the economics of scope where by a diversified organization is an effectively organizing its actions (á Penrose, 1959). For instance, the firm might usage the previously supply chain methods for different types of good or services. Similarly, the firm can utilize its legal and financial activates for diversification where they enter or exit business for good competitions with its structural capabilities.

The third and final motive is market power. There can be anti-competitive objects for variation (Villalonga, 2000). The first is the uses of profit that is generated in one firm to support pricing in alternative. The second object includes conspiring with others firm that are in the same business in several markets. Finally, firm might become and big gun and takes a business from the small competitor.

1.5 Problem Statement

The past researchers have investigated that product diversification can lead to increase the bank risk and solvency. The diversification can also affect the market value of bank there by raising implication for bank solvency. The reason on behalf of bank risk increased is that diversify banks are subjected to market and economic factors. Deregulations can lead banks to involve in off-balance sheet actions and their income streams can be further representation to variation in economy wide factors and banks have higher levels of market risk. This is the appearance of the Global Financial Crisis (GFC) be able to be copied towards the liberalized environment shaped through deregulation of economic. Due to the globalization and integration various issues and challenges are facing to the banks such as non-interest income, interest income, fees and commission. When the banks diversify the assets then banks facing the issues regarding to the asset and equity returns due to rapid change in financial regulation and customer demands.

1.6 Research Question

RQ1: What is the impact of the income diversification on bank risk?

RQ2: What is the impact of asset diversification on bank risk?

1.7 Research Objective

RO1: To examine the impact of income diversification on bank risk.

RO2: To examine the impact of asset diversification on bank risk.

1.8 Significance of the Study

The current research overviews about the problem of whether the diversification of product challenges in the south Asian Banks during deregulatory period have effect on to solvency and profit risk either increasing or decreasing. Our study will

provide the multi theoretic concepts for improving the effect of diversification of product (income and asset) and bank risk in south Asian banking region. Main concern of this study is to examine the influence of product diversification on bank risk combined with regression analysis and also separate impact through regression analysis.

1.9 Plan of the Study

This research paper examine the product diversification attempts on south Asian countries have an impact on their risk. Chapter 2 covers the research methodology of the current research study. Data analysis and result are covered in chapter 4. Finally chapter 5 concludes the finding, and recommendation of the current research study.

Chapter 2

Literature Review

This section explains product diversification (income and asset diversification) on bank risk institution. Product diversification use two measurement of risk for this purpose: (1) SD return on Equity and (2) SD of return on Asset.

As par to the theory prospective investigator sight decision-making efforts to expand business events crossways numerous industries as territory building training to facilitate serve up manager's be the owner of interest all the way through gaining authority and reputation even as compromise the purpose of maximization the wealth of shareholders (Freund, Trahan, and Vasudevan 2007, Markides and Ittner 1994, Moeller, Schlingemann, and Stulz 2005). while, the decision- making protection is to diversify business accomplish performance improvement during economic of range, economics of capacity (mixture of advertising and delivery channel of different product), tax reserves (offering fatalities of single division beside the profit of an additional division), risk decrease (lower the instability of earning money flow), increase debit capability (increase capability to utilize low-priced debit capital) as well as minor possibility of financial distress (Berk & DeMarzo, 2007, Madura 2012). The attribute of modern-world bank institution be their purpose the same as financial corporation's so as to entail the present of diversify product and services, as well as thus the possible for improved profits, risk and product geographic diversification. The greater part of US banks are diversify in conditions of ssmix up of product and geographic location, (Goetz, Laeven, & Levine (2013), while the diversification is an organization policy so as to is follow by a lot

of financial institution while the purpose of increasing their income stream (Goetz et al., 2013).

The literature on diversification of income and asset diversification. The performance of bank zone indicates the meaning of diverseness for the bank to enlarge their earning, allowing for the actuality this study aim to find out the result of income and asset diversification on act of banks in south Asian countries and investigate how banks can pick up their feet through diversification.

An extremely aggressive financial atmosphere, bank be currently further worried for earn volatility and the growing threat of defaulting. Now banks are look for new means to create income in accumulation to their predictable approach that is called income diversification. Toward decrease the volatility of their earning the diversification of income is broadly used perception by banks. In view of the implication of income diversification used for bank sector the association between acts has been empirically explore in several countries and income diversification other than mixed result has been report.

DeYoung and Roland (2001), suggest so as earning volatility increase because banks transfer their product mix up as of predictable revenue generate (banking operational behavior) toward fee base (non-operational behavior). While the share fee-based behavior increases in income of bank, financial while operating leverage to raise so as to go ahead towards high earning volatility. A relationship of marketplace nature and bank's own technology expansion with growing non- interest income outcome in banks zone of USA outcome indicate to raise in non-interest income outcome into enhanced performance, highly earn volatility and get worse risk and return exchange on behalf of banks (DeYoung & Rice, 2004). Furthermore, this paper establishes to facilitate fine manage banks be gradually changing their established income generate behavior towards behavior of Non-interest income.

Stiroh (2004), confirmed so as to banks in US are receiving benefit of diverseness into the shape of constant revenue and reduce risk during changing their revenue generate behavior as of interest to Non-interest Income. On collective level, non-interest income especially substitute income is set up toward be further volatile

than Interest Income. Together is highly related where of level of bank risk and return are negative associated among raise into Non interest Income. Stiroh and Rumble (2006) Analysis how the achievement of financial investment company of US is afflicted through the transfer in their revenue generate behavior (conventional interest income) in the direction of trading, fee post and Non-interest Income. They show the above volatility of Non-interest Income because foggy-view diversification of income. The Non interest Income is much unstable compared to Interest Income other than not naturally further beneficial.

Chiorazzo, Milani, & Salvini (2008), studies that the income diverseness on achievement of Italian bank and described that risk used to return of banks increases by means of the increase in income diversification. They farther confirmed so as to diversification radically increase the risk familiar the big bank in favor of return. Diversification of income boosts the risk familiar big bank in favor of return other than the advantage of Non-Interest Income decreases because the mass develops into larger.

Acharya, Hasan, and Saunders (2006), investigate the effect of diverseness on risk at a different point and banks return into Italy year end 1993 to 1999. They explained negative relationship between the scrotal loan and industrial diversification on act of banks. Furthermore, in the negative aggressive environment banks confirm to be incompetent in reaping the advantage of revenue diversification. Huang and Chen (2006) Investigated so as to contain a reasonable percent of Non-interest Income, the banks among each especially low otherwise high percent of Non-Interest Income are more cost professional.

Craigwell & Maxwell (2006), described that influence of Non-Interest Income and its effect on top of financial profitability into Barbados from the year end 1985 to 2001. They described that there is a positive relationship between the effects of non-interest income on the performance, banks among further non-interest income have a more profits however it as well raises the instability of opening income. The share of Non-Interest Income for banks enlarged due to the influence of, technology changes and deregulation. Mishra & Sahoo (2012) Expressed to the larger variation in operating income of Indian banks is owed to diversification. Pennathur,

Subrahmanyam, & Vishwasrao (2012) Confirmed that the there is no effect of ownership structure on banks association in non-interest income activities. They recommended that emerging markets banks (like) be able to use non-interest while source of revenue diversification as well as to raise the income.

Commission and fee confirmation toward maintain the sight to a raise within banks fee promoting activities yields non depository its deliberate benefit of diversification. Slightly researchers explain to facilitate banks association in activities of Non Interest be able to raise systematic risk of bank quite than decreasing risk of bank, as well as the enhance in systematic risk occur as of a positive relationship association among Interest Income and Non-Interest Income for example commission and fee (Stiroh 2004, Stiroh & Rumble 2006, Baele et al. 2007, Lepetit, Nys, Rous, & Tarazi 2008 Schmid & Walter (2009). For example, Stiroh (2004) observe a positive relationship association among bank interest margin and fee income and for US banks, as well as the association increase over time involve higher systematic risk and reducing the advantage of diversification.

Lee, Yang, & Chang (2014), investigate the performance and risk of banks by the effect of non- interest income intended in over 22 Asian countries for 967 individual banks from the time period 1995 to 2009. They observed that the banks of south Asian countries the non-interest activities can decrease systematic risk however could not increase in profitability. They found that the processing into the activities of Non-Interest rise the risk of bank in that countries which had high income whereas growing the productivity or declining the risk of bank in that countries which had middle and low income. They achieved that the country revenue and banks specialization level elements for diversification of income.

Williams (2016), investigate that the banks revenue configuration and banks risk in Australia. They found among higher revenue configuration and lower Non-Interest are fewer risky decreasing while banks specialization effect is measured. Williams (2016) Furthermore observe the financial crisis in 2008 have various effects on the bank's configuration of revenue and risk.

Köhler (2014), investigate the banks risk of Non-Interest Income in the German banking sectors from the time period 2002 and 2010. They suggested that the

retail-oriented banks and smaller banks encompass better benefit as of diversification of income correlated toward better as well as banks of investment oriented. Köhler (2014) Wind up that the risk depends on the result of Non-Interest Income with the business model of a risk and bank performance between in 226 banks crosswise 11 emerging economies. They initiated that diversification of income increase productivity although decline risk of solvency mostly in favor of banks to contain reticent risk exposure.

Pennathur et al. (2012), examined that the bank risk and diversification of revenue for ownership banks of Indian from the time duration 2001 to 2009. They reported that the banks of public sector have lesser income fee whereas banks of foreign description higher income fee. They as well suggest facilitating the bank of public sector through superior level of state ownership are fewer likely toward follow sources of Non-Interest income.

Ahamed (2017), examined that the effect of asset quality and ownership on bank Non-Interest Income between the Indian banks. They found to facilitate high Non-Interest Income of share yields high profit and adjusted risk profit mostly while banks are concerned in advance trade activities also in favor of bank that have worse quality of asset.

Meslier, Tacneng, & Tarazi (2014), investigated that the influence of bank income diversification resting on the performance of bank within a fast-growing economy. They found to facilitate the moving of banks towards the activities of Non-Interest Income increase risk and profit of banks. Accustomed income mainly once is concerned within trade within government securities. Meslier et al. (2014) establish that banks of foreign advantages additional as of income diversification related toward banks of domestic although income diversification additional favorable for banks by low contact to SMEs. Full collectively, these investigations demonstrate that commission and fee be able to any increase banks systematic risk or yield various diversification reimbursement.

Previous study shows mixed result of banks diversiness and performance and emphasized the meaning of income diversiness in developing banks productivity. To decrease the income volatility, connect through the important operation, as well as

the risk of default banks is able to use non-interest revenue the same as a resource of diversification. Since the benefit of banks for the period of 2000 to 2014 in case of south Asian countries. Within presented literature by provided that strategy for the banks how be able to progress profitability during income diversification as well as diversification of asset in south Asian countries. The finding of the study assists the managers to find out the volatility of income sources. So that is able to cause enlarge within risk of default for the banks.

Hasan, Saunders, & Acharya (2002), implemented among the best plus essential research on diversification on bank's credit portfolio. They analysis banks of Italy, also initiate that in cooperation business as well as sectoral diversification decrease bank return whereas generating riskier loans. At the same time (Hayden et al. 2007) investigate on the banks of German. They found that the diversification tends toward be connected among reduction in banks return, still subsequent to risk managing. Just within minority circumstances for example excessive diversification of industrial as well risk do, they reached relationship among return of bank plus diversification significant positive. Kamp et al. (2004), analysis even if banks of Germany diversify their loan portfolios or focus on certain industries and founded that a majority of banks significantly increase loan portfolio diversification. David & Dionne (2005) implemented that the large banks in Sweden handle their loan portfolio and investigate the policy following loan portfolio diversification by banks. Schertler, Buch, & von Westernhagen (2006), investigated that the whole domestic lending through saving banks and credit cooperatives as well as their regional institutions smaller banks. Banks to facilitate are highly specialized in exact sectors responds positively and, unrelated cases, more powerfully to national sectoral growth.

Boot & Schmeits, (2000), investigated that the predictable cost of financial distress or bankruptcy can be decrease through spreading operation across different economic environment. For example, merger among banks and securities firm, real estate sector, and insurance companies, moreover find to banks merging among insurance companies may fall the risk of bankruptcy, even as merging through securities and real estate organizations would extend the risk of bankruptcy (Boyd

& Graham, 1988). Rose (1989), suggest that banks gripping towards non-bank product lines might decrease cash flow risk. Berger, Demsetz, & Strahan (1999), suggest that the consolidation into the financial services industry have been dependable by better diversification of risk on standard however with little or else no cost productivity developments.

Moreover, the product diversification and services dimension, there is also a development to geographically diversifying of banks. Bank contain the possible toward accomplish economic of scale in geographical dimension, as a preliminary investment is completed as well as the essential infrastructure be into place, organizations be able to develop. The organization somewhere else by a potentially reduce cost. Advantage of geographical diversification embrace improved right to use capital markets in further regions or countries. That possibly leads to minimized cost of capital (Deng & Elyasiani, 2008), better market control (Iskandar-Datta & McLaughlin, 2007). The banks which are diversified geographically be able to shift resources from high-tax areas so that can reduce tax liabilities. Consistence by these influences, (Mahajan, Rangan, & Zardkoohi, 1996), US multinational and domestic banks be able toward completely use economies of scale, and had lower inefficiencies than domestic banks.

Berger, DeYoung, Genay, & Udell (2000), studied the effectiveness of cross border consolidation of economic companies as of United Kingdom, United Sate, Spain, France and Germany. They found to the have higher profit efficiency of domestic bank that do banks of foreign, excluding in favor of United State based foreign banks. DeLong (2001) Examine US bank mangers with respected to equally activity and geographic location and find that banks focusing on both activity and geographic were value increase.

2.1 Hypotheses Statement

H$_1$: There is significant relationship between income diversification and bank risk.
H$_2$: There is significant relationship between asset diversification and bank risk.

Chapter 3

Research Methodology

3.1 Data Description and Methodology

Data description and methodology which were used in this study and explain the different methods and tests used in this study and also population, sample size and source of data are taken for the study valid analysis. The present study explores the activities of product diversification have lead to increase or decrease profit related risky position and solvency in South Asian banking institutions. To examine the impact of study has been chosen the commercial banks of South Asian countries such as India, Sri Lanka, Bhutan, Afghanistan, Maldives, Nepal, Pakistan, and Bangladesh) for the time period over 2000 to 2014 was downloaded from the banks www.opendoor.com.pk database. Into manage comparability, all data are in thousand. Study associated annually bank level accounting data with annually country level data.

The study basic purpose of sampling is to cover 239 commercial banks. 138 banks has been removed due to the less data availability and also other 74 banks removed because data didn't available greater than 9 years which were included countries of Afghanistan, Bangladesh, Bhutan, Maldives, and Sri-Lanka.

Study concluding dataset consist of an asymmetric panel of 27 commercial banks from four South Asian countries (India, Pakistan, Iran, and Nepal) between 2000 and 2014. The time of privatization, deregulation and market-driven reforms.

3.1.1   Population

Population of this study is based on South Asian banking sectors in which 27 commercial banks of South Asian countries which include (India, Pakistan, Iran and Nepal) year end 2000 to 2014.

TABLE 3.1: Classification of Sample Size

Sr.No	Bank	Country	Years
1	UCO Bank	India	2000-2014
2	Vijaya Bank	India	2000-2014
3	Karnataka Bank limited	India	2000-2014
4	Punjab and Sind bank	India	2000-2014
5	State Bank of Bikaner and Jaipur	India	2000-2014
6	United Bank of India	India	2000-2014
7	Lakshmi vilas Bank	India	2000-2014
8	HSBC India	India	2000-2014
9	City union Banks Ltd	India	2000-2014
10	Catholic Syrian Bank	India	2000-2014
11	Dhaniaxmi Bank Ltd	India	2000-2014
12	Ratnakar Bank Ltd	India	2000-2014
13	Taminad mercantile Bank Ltd	India	2000-2014
14	Development credit Bank Ltd	India	2000-2014
15	Cosmos Co-op Bank	India	2000-2014
16	Bank Sepah	Iran	2000-2014
17	Standard Chartered Bank Nepal	Nepal	2000-2014
18	Himalayan Bank Ltd	Nepal	2000-2014
19	Nepal investment Bank Ltd	Nepal	2000-2014
20	Nepal SBI Bank Ltd	Nepal	2000-2014
21	Everest Bank	Nepal	2000-2014
22	Bank of Kathmandu	Nepal	2000-2014
23	Habib Bank Ltd	Pakistan	2000-2014
24	MCB Bank Ltd	Pakistan	2000-2014
25	Soneri Bank Ltd	Pakistan	2000-2014
26	Bank of Punjab	Pakistan	2000-2014
27	Faysal bank Ltd	Pakistan	2000-2014

These are the list of banks which are the part of the study.

3.1.2   Sample

Our study encompassed four south Asian countries: Pakistan India Iran and Nepal. The study period is 2000 to 2014.

TABLE 3.2: Number of Countries

Sr. No.	Country	Banks
1	India	15
2	Pakistan	6
3	Nepal	5
4	Iran	1
total	4	27

In this study the sample consists of the 4 countries and from these countries the total numbers of banks which are the part of this study are 27. The sample is based on the availability of the data.

3.1.3   Sources of Data

This study is based on secondary data, which is already available and ready for use. Sources of data include the government and private publications, financial reports of entities and the financial statements.

Hence on the behalf of sources of data us used as annual report and financial statement of South Asian banking institution. The banking institutions which are the part of this study are taken based on the data available on the variables of the study.

3.1.4   Descriptive Analysis

Descriptive statistics is captured by using the data of statistical behavior. Descriptive statistics provide the average of data, median that divide the data set into two equal segments and it is the middle value of data set.

In standard deviation give the information that how much the spread of data dissemination of data from its mean value, if mean and standard deviation used separately both will be worthless so both should be used together. This table shows the data outcome and variations in returns.

3.1.5 Correlation Analysis

Analysis of correlation use to capture the degree of relationship among variable. Correlation is helpful because it can point to a projective relationship between variables. This tool also deals about the direction of association among variables. Correlation analysis among variables indicates positive and negative relationship among different variables.

Its range lies from +1 to -1. Low correlation between two variables shows low chances of multicollinearity while high correlations be- tween two variables indicate high chances of multicollinearity.

3.2 Econometric Model

3.2.1 Panel Data Analysis

Panel data analysis contains on the mix of cross sectional and time series data. When panel data have same series of time observations for every cross-section and variable it known as balanced panel. When series of time observations differs among cross sections the panel is known as unbalanced panel (Gujarati, 2003).

3.2.2 Estimation of Data by Using Panel Regression

In this study Panel data use to capture the influence of monetary policy on both Islamic and conventional bank financing of Pakistani banking sector. Estimation of panel data is usually done by POLS, fixed and random effect model.

$$
\begin{aligned}
Y_{i,t} = {} & \alpha + \beta_1(DIVERS_{i,t}) + \beta_2(INDDUM_{i,t}) + \beta_3(NEPDUM_{i,t}) + \\
& \beta_4(PAKDUM_{i,t}) + \beta_5(IRANDUM_{i,t}) + \beta_6(INDDUM_{i,t} * DIVERS_{i,t}) + \\
& \beta_7(NEPDUM_{i,t} * DIVERS_{i,t}) + \beta_8(PAKDUM_{i,t} * DIVERS_{i,t}) + \\
& \beta_9(IRANDUM_{i,t} * DIVERS_{i,t}) + \beta_10(EA_{i,t}) + \beta_{11})(LNTA_{i,t}) + \\
& \beta_{12}(LA_{i,t}) + \varepsilon_{i,t}
\end{aligned}
\tag{3.1}
$$

The study model in separate regression, the depended variable $Y_{i,t}$ is representing: (1) standard deviation of return on (2) standard deviation of returns on equity. Where t in year and i for bank. The main informative variable is $DIVERS_{i,t}$. That is variable diversification i for banks t for year. In every regression, this variable be representing with one of the diversification measures describe during part of Diversification measure (i.e. HHI income HHI asset and their components). The further variables defined in table 3.3.6. With ε_i is the error term.

In the above model study consist of a number of banks specific control variable on behalf of the following reasons. The variable (EA) which is equity to asset is consisting of to confine the control capital of bank base on the situation of risk taking. whereas various study suggest that the bank capital and risk taking positive impact on each other (Koehn & Santomero, 1980). Merton, (1977) suggest that the bank contribute risk seeking toward have lower level of capital.

(NLTA) natural logarithm of total asset which is represent the size of the bank is used for the reason that the control of income diversification of bank risk have been found toward the conditional bank size (De Jonghe, Diepstraten, & Schepens, 2015, Abedifar, Molyneux, & Tarazi, 2018). this variables also account for effect of size (Banz, 1981), (Lakonishok & Shapiro, 1984), (Fama & French, 1992).

The asset portfolio with a high fraction of loan in banks which showing the higher risk appropriate toward the less liquid nature of loan correlated among other financial asset (Molyneux, Lloyd-Williams, & Thornton, 1994, Stiroh & Rumble, 2006) and appropriate toward the probable misconduct of asset to facilitate make Non performance loan significance (Männasoo & Mayes, 2009), the loan to asset is used to account for these effects.

3.2.3   Common Effect Model

The model works about the fundamental expectation's coefficient of all cross-sections across the time is constant it means time invariant. But the assumption made here is difficult to happen and it leads to the inconsistency and reliability problem of the slope coefficient of the variable. However, this model does not capture the random and fixed effect presence in the panel data.

$$
\begin{aligned}
Y_{i,t} = {}& \alpha + \beta_1(DIVERS_{i,t}) + \beta_2(INDDUM_{i,t}) + \beta_3(NEPDUM_{i,t}) + \\
& \beta_4(PAKDUM_{i,t}) + \beta_5(IRANDUM_{i,t}) + \beta_6(INDDUM_{i,t} * DIVERS_{i,t}) + \\
& \beta_7(NEPDUM_{i,t} * DIVERS_{i,t}) + \beta_8(PAKDUM_{i,t} * DIVERS_{i,t}) + \\
& \beta_9(IRANDUM_{i,t} * DIVERS_{i,t}) + \beta_{10}(EA_{i,t}) + \\
& \beta_{11}(LNTA_{i,t}) + \beta_{12}(LA_{i,t}) + \varepsilon_{i,t}
\end{aligned}
\tag{3.2}
$$

The study model in separate regression, the depended variable $Y_{i,t}$ is representing: (1) standard deviation of return on asset (2) standard deviation of returns on equity. Where t in year and i for bank. The main informative variable is $DIVERS_{i,t}$. That is variable diversification i for banks t for year. In every regression, this variable be representing with one of the diversification measures describe during part of Diversification measure (i.e. HHI income HHI asset and their components). The further variables defined in table 3.3.6. With $\varepsilon_{i,t}$ is the error term.

In the above model study consist of a number of banks specific control variable on behalf of the following reasons. The variable (EA) which is equity to asset is consisting of to confine the control capital of bank base on the situation of risk taking. whereas various study suggest that the bank capital and risk taking positive impact on each other (Koehn & Santomero, 1980). Merton, (1977) suggest that the bank contribute risk seeking toward have lower level of capital. (NLTA) natural logarithm of total asset which is represent the size of the bank is used for the reason that the control of income diversification of bank risk have been found toward the conditional bank size (De Jonghe et al., 2015, Abedifar et al., 2018). this variables also account for size effect (Banz, 1981, Lakonishok & Shapiro, 1984, Fama & French, 1992). The asset portfolio with a high fraction of loan in banks which showing the higher risk appropriate toward the less liquid nature of loan correlated among other financial asset (Molyneux et al., 1994 , Stiroh & Rumble, 2006) and appropriate toward the probable misconduct of asset to facilitate make Non performance loan significant(Männasoo & Mayes, 2009); the loan to asset is used to account for these effects.

3.2.4 Fixed Effect Model

That model slope coefficient is constant but intercept vary from company to company. It assumes that there may not be temporarily affect in time series while estimation may carry cross sectional effect.

$$
\begin{aligned}
Y_{i,t} = {} & \alpha + \beta_1(DIVERS_{i,t}) + \beta_2(INDDUM_{i,t}) + \beta_3(NEPDUM_{i,t}) + \\
& \beta_4(PAKDUM_{i,t}) + \beta_5(IRANDUM_{i,t}) + \beta_6(INDDUM_{i,t} * DIVERS_{i,t}) + \\
& \beta_7(NEPDUM_{i,t} * DIVERS_{i,t}) + \beta_8(PAKDUM_{i,t} * DIVERS_{i,t}) + \\
& \beta_9(IRANDUM_{i,t} * DIVERS_{i,t}) + \beta_{10}(EA_{i,t}) + \\
& \beta_{11}(LNTA_{i,t}) + \beta_{12}(LA_{i,t}) + \varepsilon_{i,t}
\end{aligned}
\tag{3.3}
$$

The study model in separate regression, the depended variable $Y_{i,t}$ is representing: (1) standard deviation of return on asset (2) standard deviation of returns on equity. Where t in year and i for bank. The main informative variable is $DIVERS_{i,t}$. That is variable diversification i for banks t for year. In every regression, this variable be represent with one of the diversification measure describe during part of Diversification measure (i.e. HHI income HHI asset and their components). The further variables defined in table 3.3.6. With $\varepsilon_{i,t}$ is the error term.

In the above model study consist of a number of banks specific control variable on behalf of the following reasons. The variable (EA) which is equity to asset is consisting of to confine the control capital of bank base on the situation of risk taking. whereas various study suggest that the bank capital and risk taking positive impact on each other (Koehn & Santomero, 1980). Merton, (1977) suggest that the bank contribute risk seeking toward have lower level of capital. (NLTA) natural logarithm of total asset which is represent the size of the bank is used for the reason that the control of income diversification of bank risk have been found toward the conditional bank size (De Jonghe et al., 2015, Abedifar et al., 2018). this variables also account for size effect (Banz, 1981, Lakonishok & Shapiro, 1984, Fama & French, 1992). The asset portfolio with a high fraction of loan in banks which showing the higher risk appropriate toward the less liquid nature of loan correlated among other financial asset (Molyneux et al., 1994, Stiroh & Rumble, 2006) and appropriate toward the probable misconduct of asset to facilitate make

Non performance loan significant (Männasoo & Mayes, 2009); the loan to asset is used to account for these effects.

3.2.5 Random Fixed Effect Model

This model capture considered as error term. It does nothing with the cross sections (banks). This model explains the variation among the different banks. It offers following benefits.

- Fewer parameters to estimate with comparison to fixed effect model in Random effect model.

- Random effect model provide the permission for other independent variables with same number of observations. This model capture interrupt considered as error term. It does nothing with the cross sections (banks). This model explains the variation among the different banks.

3.2.5.1 Likelihood Test

The purpose of testing the likelihood analysis be clear the possibility of fixed or common effect model by means of state which if value of p were significant (less than 0.05 confidence interval) than it can be apply fixed effect model but if value of p were greater than 0.05 then the study were apply common effect model and vice versa in case when p value is not significant.

3.2.5.2 Huasemen Test

This test used to decide among random effect model and fixed effect model. If P-value is insignificant than random effect model is applied. If the Chi-square and F stat. of cross-section is less than 0.05 then fixed effect model is applied.

3.3 Measurement of Variables

TABLE 3.3: List of Variables

Variables	Codes	Measurement	Definition	References
SD of return on asset.	$\sum$ ROA.	Profitability ratio and measurement net income.	The return on asset deliberate uses the repeated annual data of return on asset existing bank.	
SD returns on equity.	$\sum$ ROE.	Profitability ratio and measurement profit of its shareholders.	The return on equity deliberate uses the repeated annual data return on equity existing the bank.	
Interest Income to Total Income.	IITI.	Diversification of Income.	Interest Income Divided by Total Income.	Edirisuriya p, Gunasekarage A and perera S (2018).
Non Interest Income to total income.	NITI.	Diversification of Income.	Non Interest Income Divided by total Income.	
Fee and Commission to total Income.	FCTI.	Diversification of Income.	Fees and Commission Income Divided by total Income.	
Other Income to total Income.	OITI.	Diversification of Income.	Other Income Divided by Total Income.	
Loan to Asset.	LA.	Asset diversification.	Loans Divided by total Asset.	
Other Loan To Total Asst.	OLTA.	Asset diversification.	Other Loan Divided by Total Asset.	
Equity to Asset.	EA.	Financial leverage named balance sheet.	Total Equity Divided by total Asset.	
Nature Logarithm of Total Asset.	NLTA.	The size of firm measurement a deferent way like sales .asset etc.	Nature Logarithm of Total Asset.	

Chapter 4

Data Analysis and Discussion

Chapter 4 cover the various test applied to explore the phenomena under discussion and interprets the result obtained. This chapter includes result and discussion. Result includes the descriptive statistic, correlation matrix and panel data analysis. This examined the impact of product diversification on bank risk of South Asian countries from the time period 2000 to 2014.

4.1 Descriptive Statistics

Descriptive statistics are used to describe the basic feature of the data in a study. They provide simple summaries about the sample and the measurement. Together with simple graphic analysis, the from the basic of virtually every quantitative analysis of data.

Statistical behavior of data is capture by using the descriptive statistics. Descriptive statistics includes Depended, in depended variables. The descriptive statistics test shows summary of data that include mean, minimum, maximum and standard deviation. The mean value tells about average of data, standard deviation tells about spread and measure of dispersion in the data value as of the mean, standard deviation and mean are low due to the used as separately. Minimum and maximum tells about current series of data.

TABLE 4.1: Descriptive Statistic for India

	SROE	SROA	EA	OLTA	OITI	FCTI	NITI	IITI	NLTA	LA
Mean	0.045496	0.002578	0.069046	0.498774	0.186664	0.037188	0.000181	0.216577	14.90650	0.537663
Maximum	0.626466	0.027017	0.335939	0.688690	0.511771	0.122187	0.002382	0.327917	17.49907	0.716727
Minimum	3.82E-05	8.72E-06	0.022757	0.041312	0.005590	0.004815	-0.000351	0.128402	11.75790	0.272188
Std. Dev.	0.072769	0.003519	0.036800	0.121476	0.097199	0.025508	0.000304	0.042856	1.279636	0.093773
Skewness	4.125753	3.162206	2.820997	-1.254173	0.158515	1.163443	4.107473	0.512692	-0.062989	-0.638202
Kurtosis	25.76906	16.66241	16.77820	4.742148	2.870230	3.669223	24.91237	2.688895	2.365251	2.714390
Probability	0.000000	0.000000	0.000000	0.000000	0.596995	0.000000	0.000000	0.006427	0.158678	0.000542
Observations	211	211	211	211	211	211	211	211	211	211

The interpretation of **Table: 4.1**, investigates the descriptive statistics of India with the whole variable which are used in study. It includes mean, median, standard deviation; skewness etc. It show the data related to asset and income diversification on bank risk of South Asian countries from 2000 to 2014. The detail explanation of the above table is given in below:

The average value of (SDROE) is 0.045; its mean that average 4% profitability ratio form its share holder. The maximum value of (SDROE) is 0.62 and minimum value of standard deviation on return of equity is 3.82E.

The value of standard deviation value on (SDROE) is 0.072. The skewness in (SDROE) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic. The average value of (SDROA) is 0.002; its mean that average 0.2% profitability ratio form its Net Income. The maximum value 0.02 (SDROA) and its minimum value (SDROA) is 8.72E and standard deviation value of return on Asset is 0.003. The skewness in (SDROA) is positive which shows tail on right side is flat.

The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic. The average value equity to asset is (EA) 0.06; its mean that the financial leverage is 0.6%, the financial leverage ideal value is 0.5 or less than 0.5.

Lower financial ratio is better due to debt finance. The maximum (EA) is 0.33. Its minimum value of (SDROA) is 0.02 and standard deviation value of Equity to Assets 0.03. The skewness in (EA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of other loan to total asset (OLTA) is 0.49; its mean that 49% income India generates form their loan and avoid non tradition activities. The maximum value of (OLTA) is 0.68. The value of minimum of (OLTA) is 0.04 and standard deviation value (OLTA) 0.12.

The skewness in (OLTA) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value (OITI) is 0.18; its mean that India banks generate 18% OITI share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to other income as a source of income.

The maximum value of (OITI) is 0.5 and minimum value of other income to total income (OITI) is 0.005 and standard deviation value of (OITI) 0.09. The skewness in (OITI) is positive which shows tail on right side is flat. The kurtosis value is less than 3 having platykurtic.

The average value of fee and commission to total income (FCTI) is 0.03; its mean

that India banks generate 3% (FCTI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to fee and commission as a source of income.

The maximum value of (FCTI) is 0.12 and minimum value of (FCTI) is 0.004 and standard deviation value of (FCTI) 0.02. The skewness in (FCTI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (NITI) is 0.0001; its mean that India banks generate 0% (NITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to Non-interest income as a source of income. The maximum value of NITI) is 0.002. The value of minimum of (NITI) is -0.0003. The standard deviation value of (NITI) 0.0003. The skewness in (NITI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (IITI) is 0.21; its mean that India banks generate 21% (IITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to interest income as a source of income. The maximum value of (IITI) is 0.32. The minimum value of (IITI) is 0.12 and standard deviation value of (IITI) 0.04. The skewness in (IITI) is positive which shows tail on right side is flat. The kurtosis value is less than 3 having platykurtic.

The average value of (NLTA) is 14.9; its mean the size of the Indian bank. The maximum value of nature logarithm of total asset (NLTA) is 17.4 and minimum value of (NLTA) is 11.7 and standard deviation value of nature logarithm of total asset (NLTA) 1.2. The skewness in (NLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of loan to total asset (LA) is 0.53; its mean that 53% income India generates form their loan and avoid non tradition activities. The maximum value of loan to total asset (LA) is 0.71 and the minimum value of (LA) is 0.27 and standard deviation value of (LA) 0.09. The skewness in (LA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

TABLE 4.2: Descriptive Statistic for Iran

	SROE	SROA	EA	OLTA	OITI	FCTI	NITI	IITI	NLTA	LA
Mean	0.023928	0.002141	0.065455	0.622230	0.468624	0.036636	2.75E-05	0.220002	16.60814	0.622230
Maximum	0.093722	0.010695	0.144763	0.756644	0.678735	0.053007	7.67E-05	0.342459	17.06723	0.756644
Minimum	0.000595	2.13E-06	0.030946	0.472875	0.124221	0.020893	3.99E-06	0.092630	15.40416	0.472875
Std. Dev.	0.029606	0.003132	0.033244	0.082823	0.236900	0.010837	2.21E-05	0.065861	0.515913	0.082823
Skewness	1.250337	1.793762	1.207965	-0.024921	-0.740967	-0.294097	1.167588	-0.032195	-1.219071	-0.024921
Kurtosis	3.319071	5.324986	3.635406	2.221689	1.658671	1.828521	3.154329	2.745302	3.327613	2.221689
Probability	0.178853	0.007085	0.184497	0.848118	0.338897	0.627895	0.226884	0.981481	0.194165	0.848118
Observations	13	13	13	13	13	13	13	13	13	13

The interpretation of **Table: 4.2**, investigates the descriptive statistics of Iran with the whole variable which are used in study. It includes mean, median, standard deviation; skewness etc. It show the data related to asset and income diversification on bank risk of South Asian countries from 2000 to 2014. The detail explanation of the above table is given in below:

The average value of (SDROE) is 0.02; its mean that average 2% profitability ratio form its share holder. The maximum value of (SDROE) is 0.09 and minimum value of (SDROE) 0.0005. The value of standard deviation on (SDROE) is 0.02.

The skewness in (SDROE) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (SDROA) is 0.002; its mean that average 0.2% profitability ratio form its Net Income. The maximum value of (SDROA) is 0.01 and minimum value (SDROA) is 2.13E and standard deviation value of (SDROA) is 0.033.

The skewness in (SDROA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value equity to asset is (EA) 0.065; its mean that the financial leverage is 0.6%, the financial leverage ideal value is 0.5 or less than 0.5. Lower financial ratio is better due to debt finance.

The maximum value of (EA) is 0.14 and minimum value of Equity to Asset is 2.13E and standard deviation value of Equity to Assets 0.03. The skewness in (EA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of other loan to total asset (OTLA) is 0.62; its mean that 62% income Iran generates form their loan and avoid non tradition activities. The maximum value of other loan to total asset (OLTA) is 0.75.

The minimum value of (OLTA) is 0.47. The value of standard deviation of is (OLTA) 0.08. The skewness in (OLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of (OITI) is 0.46; its mean that Iran banks generate 46% OITI share in the region of South Asia. This suggests that banks of Iran showing to other income as a source of income.

The maximum value of other income to total income (OITI) is 0.67 and minimum value of (OITI) is 0.12 and standard deviation value of (OITI) 0.23. The skewness in (OITI) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of fee and commission to total income (FCTI) is 0.03; its mean that Iran banks generate 3% (FCTI) share in the region of South Asia. The low

ratio suggests that banks in region of South Asian are not showing to fee and commission as a source of income.

The maximum value of (FCTI) is 0.05 and minimum value of (FCTI) is 0.02 and standard deviation value of (FCTI) 0.01. The skewness in (FCTI) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of (NITI) is 2.75E; its mean that Iran banks generate 0% (NITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to Non-interest income as a source of income.

The maximum value of (NITI) is 7.67E and minimum value of (NITI) is 3.99E and standard deviation value of (NITI) 2.21E. The skewness in (NITI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (IITI) is 0.22; its mean that Iran banks generate 22% (IITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to interest income as a source of income. The maximum value of (IITI) is 0.34. The minimum value of (IITI) is 0.09 and standard deviation value of (IITI) 0.06. The skewness in (IITI) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of (NLTA) is 16.6; its mean the size of the Iran bank. The maximum value of nature logarithm of total asset (NLTA) is 17.0 and minimum value of nature logarithm of total asset (NLTA) is 15.4 and standard deviation value of nature logarithm of total asset (NLTA) 0.5. The skewness in (NLTA) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of loan to total asset (LA) is 0.62; its mean that 62% income Iran generates form their loan and avoid non tradition activities. The maximum value of loan to total asset (LA) is 0.75. The value of minimum of (LA) is 0.47. The standard deviation value of loan to total asset (LA) 0.08. The skewness in (LA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

Table 4.3: Descriptive Statistic for Nepal

	SROE	SROA	EA	OLTA	OITI	FCTI	NITI	IITI	NLTA	LA
Mean	0.027359	0.002221	0.072548	0.581508	0.096174	0.047790	0.001139	0.259744	12.55824	0.584282
Maximum	0.268769	0.015978	0.110835	0.769295	0.545910	0.079559	0.006087	0.319787	13.67565	0.769295
Minimum	0.000154	2.98E-05	0.033716	0.283135	0.019482	0.024532	0.000168	0.173787	10.77711	0.283135
Std. Dev.	0.036098	0.002437	0.015861	0.123127	0.069396	0.012531	0.001162	0.028262	0.772509	0.123993
Skewness	3.918406	2.775899	-0.073587	-0.809321	3.294652	0.046240	1.989923	-0.928238	-0.593482	-0.840396
Kurtosis	24.27378	13.54650	2.986694	2.703120	20.78852	2.439810	6.967931	3.792505	2.265564	2.724031
Probability	0.000000	0.000000	0.959882	0.006234	0.000000	0.546383	0.000000	0.000481	0.025913	0.004340
Observations	90	90	90	90	90	90	90	90	90	90

The interpretation of **Table: 4.3**, investigates the descriptive statistics of Nepal with the whole variable which are used in study. It includes mean, median, standard deviation; skewness etc. It show the data related to asset and income diversification on bank risk of South Asian countries from 2000 to 2014. The detail explanation of the above table is given in below:

The average value of (SDROE) is 0.02; its mean that average 2% profitability ratio form its share holder. The maximum value of (SDROE) is 0.26 and minimum value of (SDROE) is 0.0001. The standard deviation value of (SDROE) is 0.03.

The skewness in (SDROE) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic. The average value of (SDROA) is 0.002; its mean that average 0.2% profitability ratio form its Net Income.

The maximum value of (SDROA) is 0.01 and minimum value (SDROA) is 2.98E and standard deviation value of return on Asset is 0.002. The skewness in (SDROA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value equity to asset is (EA) 0.07; its mean that the financial leverage is 0.7%, the financial leverage ideal value is 0.5 or less than 0.5. Lower financial ratio is better due to debt finance. The maximum value of (EA) is 0.11 and minimum value of (EA) is 0.033 and standard deviation value of Equity to Assets 0.01. The skewness in (EA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of other loan to total asset (OLTA) is 0.58; its mean that 58% income Nepal generates form their loan and avoid non tradition activities. The maximum value of other loan to total asset (OLTA) is 0.76. The minimum value of (OLTA) is 0.28. The standard deviation value of other loan to total asset (OLTA) 0.12. The skewness in (OLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of (OITI) is 0.09; its mean that Nepal banks generate 9% OITI share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to other income as a source of income.

The maximum value of (OITI) is 0.54 and minimum value of (OITI) is 0.01 and standard deviation value of (OITI) 0.06. The skewness in (OITI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of fee and commission to total income (FCTI) is 0.04; its mean that Nepal banks generate 4% (FCTI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to fee and commission as a source of income.

The maximum value of (FCTI) is 0.07 and minimum value of (FCTI) is 0.02 and standard deviation value of fee and commission to total income (FCTI) 0.01. The skewness in (FCTI) is positive which shows tail on right side is flat. The kurtosis value is less than 3 having platykurtic.

The average value of (NITI) is 0.001; its mean that Nepal banks generate 0% (NITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to Non-interest income as a source of income. The maximum value of (NITI) is 0.006.

The minimum value of (NITI) is 0.0001. The standard deviation value of (NITI) 0.001. The skewness in (NITI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (IITI) is 0.25; its mean that Nepal banks generate 25% (IITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to interest income as a source of income. The maximum value of (IITI) is 0.31. The minimum value of (IITI) is 0.17 and standard deviation value of (IITI) 0.02. The skewness in (IITI) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (NLTA) is 12.5; its mean the size of the Nepal bank. The maximum value of nature logarithm of total asset (NLTA) is 13.6 and minimum value of nature logarithm of total asset (NLTA) is 10.7 and standard deviation value of nature logarithm of total asset (NLTA) 0.7. The skewness in (NLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of loan to total asset (LA) is 0.58; its mean that 58% income Nepal generates form their loan and avoid non tradition activities. The maximum value of loan to total asset (LA) is 0.76. The minimum value of (LA) is 0.28 and standard deviation value of (LA) 0.12. The skewness in (LA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

TABLE 4.4: Descriptive Statistic for Pakistan

	SROE	SROA	EA	OLTA	OITI	FCTI	NITI	IITI	NLTA	LA
Mean	0.078539	0.003937	0.086514	0.050914	0.370974	0.036447	0.000164	0.247369	14.81969	0.529166
Maximum	2.078730	0.051764	0.156475	0.141304	0.707781	0.094973	0.001048	0.349714	16.73785	0.824233
Minimum	0.000436	3.68E-05	0.015755	0.004193	0.113345	0.015109	8.42E-06	-0.011626	12.72897	0.240717
Std. Dev.	0.285690	0.007387	0.033554	0.039720	0.170957	0.011770	0.000213	0.074692	1.056363	0.110514
Skewness	5.705063	4.405251	0.153978	0.981467	0.266905	1.545359	2.083067	-1.277478	-0.251907	-0.607095
Kurtosis	36.94047	26.36836	2.343338	2.770741	1.860150	9.647054	7.600024	5.045696	2.141344	3.331978
Probability	0.000000	0.000000	0.449319	0.002632	0.089876	0.000000	0.000000	0.000000	0.221501	0.089842
Observations	73	73	73	73	73	73	73	73	73	73

The interpretation of **Table: 4.4**, investigates the descriptive statistics of Pakistan with the whole variable which are used in study. It includes mean, median, standard deviation; skewness etc. It show the data related to asset and income diversification on bank risk of South Asian countries from 2000 to 2014. The detail explanation of the above table is given in below:

The average value of (SDROE) is 0.07; its mean that average 7% profitability ratio form its shareholder. The maximum value of standard deviation return on equity is 2.0 and minimum value of standard deviation on return of equity is 0.0004.

The value of (SDROE) is 0.28. The skewness in (SDROE) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (SDROA) is 0.003; its mean that average 0.3% profitability ratio form its Net Income. The maximum value of (SDROA) is 0.05 and minimum value (SDROA) is 3.68E and standard deviation value of (SDROA) is 0.03. The skewness in (SDROA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value equity to asset is (EA) 0.08; its mean that the financial leverage is 0.8%, the financial leverage ideal value is 0.5 or less than 0.5. Lower financial ratio is better due to debt finance. The maximum value of (EA) is 0.15 and minimum value of (EA) is 0.01 and standard deviation value of Equity to Assets 0.03. The skewness in (EA) is positive which shows tail on right side is flat. The kurtosis value is less than 3 having platykurtic.

The average value of other loan to total asset (OLTA) is 0.37; its mean that 37% income Pakistan generates form their loan and avoid non tradition activities. The maximum value of other loan to total asset (OLTA) is 0.14. The minimum value of (OLTA) is 0.004 and standard deviation value of other loan to total asset (OLTA) 0.03. The skewness in (OLTA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (OITI) is 0.37; its mean that Pakistan banks generate 37% OITI share in the region of South Asia. This suggests that banks of Iran showing to other income as a source of income. The maximum value of (OITI) is 0.70 and minimum value of (OITI) is 0.11 and standard deviation value of (OITI) 0.17. The skewness in (OITI) is positive which shows tail on right side is flat. The kurtosis value is less than 3 having platykurtic.

The average value of (FCTI) is 0.03; its mean that Pakistan banks generate 3% (FCTI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to fee and commission as a source of income.

The maximum value of f (FCTI) is 0.09 and minimum value of (FCTI) is 0.01 and standard deviation value of fee and commission to total income (FCTI) 0.01. The skewness in (FCTI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (NITI) is 0.0001; its mean that Pakistan banks generate 0% (NITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to Non-interest income as a source of income. The maximum value of (NITI) is 0.001 and minimum value of (NITI) is 8.42E and standard deviation value of (NITI) 0.0002. The skewness in (NITI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (IITI) is 0.24; its mean that Pakistan banks generate 24% (IITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to interest income as a source of income. The maximum value of (IITI) is 0.34 and minimum value of (IITI) is -0.01 and standard deviation value of (IITI) 0.07. The skewness in (IITI) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (NLTA) is 14.8; its mean the size of the Pakistan bank. The maximum value of nature logarithm of total asset (NLTA) is 16.7 and minimum value of (NLTA) is 12.7 and standard deviation value of (NLTA) 1.05. The skewness in (NLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of loan to total asset (LA) is 0.52; its mean that 52% income Pakistan generates form their loan and avoid non tradition activities. The maximum value of loan to total asset (LA) is 0.82. The minimum value of (LA) is 0.24. The value of standard deviation value of loan to total asset (LA) 0.11. The skewness in (LA) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

TABLE 4.5: Overall Descriptive Statistics

	SROE	**SROA**	**EA**	**OLTA**	**OITI**	**FCTI**	**NITI**	**IITI**	**NLTA**	**LA**
Mean	0.046786	0.002737	0.073035	0.437682	0.209858	0.039495	0.000396	0.232539	14.40118	0.549743
Maximum	2.078730	0.051764	0.335939	0.769295	0.707781	0.122187	0.006087	0.349714	17.49907	0.824233
Minimum	3.82E-05	2.13E-06	0.015755	0.004193	0.005590	0.004815	-0.000351	-0.011626	10.77711	0.240717
Std. Dev.	0.136858	0.004353	0.032927	0.219845	0.154655	0.020992	0.000734	0.052130	1.540625	0.106935
Skewness	10.53616	5.409722	2.183960	-0.820891	1.234992	1.002311	3.861539	-0.497288	-0.082565	-0.561439
Kurtosis	139.7198	49.01110	14.07067	2.356022	4.194941	4.218200	21.45367	4.357615	2.216772	2.865208
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.005709	0.000033
Observations	387	387	387	387	387	387	387	387	387	387

The interpretation of **Table: 4.5**, investigates the descriptive statistics of overall banks with the whole variable which are used in study. It includes mean, median, standard deviation; skewness etc. It show the data related to asset and income diversification on bank risk of South Asian countries from 2000 to 2014. The detail explanation of the above table is given in below:

The average value of (SDROE) is 0.04; its mean that average 4% profitability ratio form its share holder. The maximum value of (SDROE) is 2.07 and minimum value of (SDROE) is 3.82E. The value of standard deviation of (SDROE) is 0.13.

The skewness in (SDROE) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (SDROA) is 0.002; its mean that average 0.2% profitability ratio form its Net Income. The maximum value of standard deviation returns on Asset is 0.05 and minimum value (SDROA) is 2.13E and standard deviation value of (SDROA) is 0.03. The skewness in (SDROA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value equity to asset is (EA) 0.07; its mean that the financial leverage is 7%, the financial leverage ideal value is 0.5 or less than 0.5. Lower financial ratio is better due to debt finance. The maximum value of (EA) 0.33 and minimum (EA) to Asset is 0.01 and standard deviation value of Equity to Assets 0.03.

The skewness in (EA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of other loan to total asset (OLTA) is 0.43; its mean that 43% income overall banks of South Asia generates form their loan and avoid non tradition activities. The maximum value of other loan to total asset (OLTA) is 0.76. The minimum value of (OLTA) is 0.004 and standard deviation value of other loan to total asset (OLTA) 0.21. The skewness in (OLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of (OITI) is 0.20; its mean that overall banks of South Asia generate 37% OITI share in the region of South Asia. This suggests that banks of Asia showing to other income as a source of income.

The maximum value of (OITI) is 0.70 and minimum value of (OITI) is 0.005 and standard deviation value of (OITI) 0.005. The skewness in (OLTA) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of fee and commission to total income (FCTI) is 0.03; its mean that overall banks generate 3% (FCTI) share in the region of South Asia. The

low ratio suggests that banks in region of South Asian are not showing to fee and commission as a source of income. The maximum value of (FCTI) is 0.12 and minimum value of (FCTI) is 0.004 and standard deviation value of fee and commission to total income (FCTI) 0.02. The skewness in (FCTI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (NITI) is 0.0003; its mean that overall banks generate 0% (NITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to Non-interest income as a source of income. The maximum value of (NITI) is 0.006. The minimum value of (NITI) is -0.0003 and standard deviation value of (NITI) 0.0007. The skewness in (NITI) is positive which shows tail on right side is flat. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (IITI) is 0.23; its mean that overall banks generate 23% (IITI) share in the region of South Asia. The low ratio suggests that banks in region of South Asian are not showing to interest income as a source of income. The maximum value of (IITI) is 0.34 and minimum value of (IITI) is -0.01 and standard deviation value of (IITI) 0.05. The skewness in (IITI) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and high central peak are leptokurtic.

The average value of (NLTA) is 14.4; its mean the size of the Pakistan bank. The maximum value of (NLTA) is 17.4 and minimum value of (NLTA) is 10.7 and standard deviation value of (NLTA) 1.5. The skewness in (NLTA) is negative which shows tail on left side is flatter. The kurtosis value is less than 3 having platykurtic.

The average value of loan to total asset (LA) is 0.54; its mean that 54% income overall banks generates form their loan and avoid non tradition activities. The maximum value of loan to total asset (LA) is 0.82.

The minimum value of (LA) is 0.24 and standard deviation value of loan to total asset (LA) 0.10. The skewness in (LA) is negative which shows tail on left side is flatter. The kurtosis value is more than 3 having shorter and thinner tails, and

high central peak are leptokurtic.

4.2 Correlation Matrix Analysis

The objective of correlation analysis is to capture the multicollinearity among the independent and dependent variables analyzed through both signs and values of the variables. **Table: 4.6**, explains the relationship among independent and dependent variables.

Pearson correlation test is used to measure the direction and strength of the relationship among variables the value of correlation coefficient ranges from positive 1 to negative 1. If the value of correlation coefficient is equal to 1 then its mean that there is perfect relationship among the variables.

When the value is zero then it shows that there is no relationship among variables. The coefficient sign provides the direction and relationship of variables. On the other hand, negative correlation coefficient of two variables indicates that if one variable increases the other variable will decrease and vice versa.

The correlation detects the problem of multicollinearity among independent variables. There is strong relationship exists between independent variables it will lead to multicollinearity problem.

Correlation shown between SDROE, SDROA, OITI, FCTI, NITI and LA is positive and EA, OLTA, IITI, NLTA is negative. Correlation shown between SDROA, OITI, FCTI, NITI, and LA is positive and EA, OLTA, IITI, and NLTA are negative.

Correlation shown between EA, OITI, FCTI, and IITI is positive and OLTA, NITI, NLTA and LA are negative. Correlation shown between OLTA, FCTI, NITI, and LA is positive and OITI, IITI and NLTA are negative.

Correlation shown between OITINLTA is positive and FCTI, NITI, IITI and LA are negative. Correlation shown between FCTI, NITI, and IITI are positive and NLTA, LA is negative. Correlation shown between NITI and LA is positive and IITI and NLTA is negative. Correlation shown between IITI, NLTA and LA are negative. Correlation shown between NLTA and A is negative.

TABLE 4.6: Correlation Matrix Analysis

	SROE	**SROA**	**EA**	**OLTA**	**OITI**	**FCTI**	**NITI**	**IITI**	**NLTA**	**LA**
SROE	1									
SROA	0.848998	1								
EA	-0.18769	-0.04237	1							
OLTA	-0.12968	-0.1622	-0.16724	1						
OITI	0.078161	0.130496	0.075451	-0.48831	1					
FCTI	0.074836	0.128298	0.040272	0.017757	-0.03355	1				
NITI	0.028651	0.086449	-0.03943	0.215171	-0.18137	0.154269	1			
IITI	-0.16375	-0.08161	0.244773	-0.08332	-0.08856	0.169593	-0.00683	1		
NLTA	-0.02101	-0.10364	-0.11012	-0.17203	0.132979	-0.13425	-0.69206	-0.05095	1	
LA	0.089337	0.063990	-0.0924	0.422049	-0.31531	-0.16699	0.103362	-0.11671	-0.03334	1

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

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

4.3   Regression Analysis

The impact of product diversification on bank risk is determined by considering the company exact variable. Panel data analysis is taken in this research work because of this data contains cross sectional and time series data. Three basic techniques used in panel data employed and these model discussions about intercept behavior.

1. Common Effect Model

2. Fixed Effect Model

3. Random Effect Model

SDROE and SDROA are depended variables and asset diversification (EA, OLTA, NLTA, and LA) and income diversification (OITI, FCTI, NITI, and IITI) are the in depended variables and estimating banks of South Asian countries with the time period 2000 to 2014.

For finest and suitable model selection in panel data analysis, primarily i have applied the Redundant Fixed Effect-likelihood ration between common effect and fixed effect model.

TABLE 4.7: Likelihood Test Ratio (ROE)

Effects test	Statistic	D.f.	Prob.
Cross-section f	2.485398	-25,353	0.0001
Cross-section chi-square	62.746465	25	0.0000

The result of **Table: 4.7**, shows that chi-square value is significant which represents that fixed effect model is appropriate for this stud and this model should be applied for further panel data analysis.

TABLE 4.8: Likelihood Test Ratio (ROA)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.188435	-25,353	0.001
Cross-section Chi-square	55.762919	25	0.0004

The result of **Table 4.8**, shows that Chi-square value is significant which represents that fixed effect model is appropriate for this stud and this model should be applied for further panel data analysis.

In the next step, I further applied the hausman test between fixed effect and random effect model. This model assumes the random behavior of intercept.

TABLE 4.9: Hausman Test (ROE)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.524875	8	0.0691

Table: 4.9 of correlated Random effects-hausman test shows that insignificant value of chi-square indicates that model not appropriate in favor of this study is Fixed Effect Model.

TABLE 4.10: Hausman Test (ROA)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.062897	8	0.337

Table 4.10 of correlated Random effects-hausman test shows that insignificant value of chi-square indicates that model not appropriate on behalf of this study is fixed effect model.

4.4 Common Effect Model (ROE)

Table: 4.11 (SROE 1st depended variable) shows the results of product diversification on bank risk of South Asian countries using Analysis of Panel regression. All the coefficient of in-dependent variables with relationship depended variable are mostly significant, with the exception of two variables (OITI, NITI). The value of adjusted R square show that 7% variation occurred in dependent variable is explained by independent variable. Return on equity influenced by the bank diversified determinants directly and may other variable effect this relationship.

TABLE 4.11: Common Effect Model (ROE)

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	0.095453	0.108972	0.875946	0.3816
OLTA	-0.140416	0.03765	-3.729538	0.0002
OITI	0.021219	0.051073	0.415462	0.678
FCTI	0.882326	0.334215	2.639996	0.0086
NITI	2.366875	12.91511	0.183264	0.8547
IITI	-0.480478	0.13333	-3.603686	0.0004
NLTA	-0.003465	0.006069	-0.570981	0.5684
LA	0.244091	0.071691	3.404743	0.0007
R-squared	0.089445			
Adjusted R-squared	0.072627			
S.E. of regression	0.131794			
Log likelihood	239.1733			
F-statistic	5.318521			
Prob(F-statistic)	0.000008			

Note: Significance level is $p<0.05$ if $p>0.05$ then it will be insignificant relationship.

4.4.1 Common Effect Model (ROA)

Table 4.12, (SROA 2nd depended variable) shows the results of product diversification on bank risk of South Asian countries using Analysis of Panel regression. All the coefficient of in-dependent variables with relationship depended variable are mostly significant, with the exception of two variables (EA, NITI). The value of adjusted R square show that 9% variation occurred in dependent variable is explained by independent variable.

TABLE 4.12: Common Effect Model (ROA)

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	0.006044	0.00353	1.712305	0.0877
EA	-0.00947	0.006804	-1.391942	0.1648
OLTA	-0.004946	0.001193	-4.146607	0
OITI	0.002728	0.001606	1.698592	0.0902
FCTI	0.034794	0.010506	3.31178	0.001
NITI	0.098611	0.409462	0.24083	0.8098
IITI	-0.007297	0.004299	-1.697242	0.0905
NLTA	-0.00037	0.000194	-1.906071	0.0574
LA	0.008349	0.002254	3.704169	0.0002
R-squared	0.11299			
Adjusted R-squared	0.094217			
S.E. of regression	0.004143			
Log likelihood	1578.64			
F-statistic	6.01883			
Prob(F-statistic)	0.0000			

Note: Significance level is p<0.05 if p>0.05 then it will be insignificant relationship.

4.5 Fixed Effect Model (ROE)

Study first investigates the return on equity diversification between considerable bank behavior on income and asset diversification and bank risk for profit and solvency the banks South Asian region. On behalf of income actives are classify four broad (IITI), (NITI), (FCTI), (OITO). While asset portfolio is categorized by equity to asset (EA), other loan to total asset (OLTA), and nature logarithm to total asset (NLTA) and loan to asset (LA). The combine effect of income and asset activities is captured by HHI income and HHI asset respectively.

TABLE 4.13: Fixed Effect Model (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.197685	0.110308	1.792119	0.0739
EA	-0.816512	0.212617	-3.840305	0.0001
OLTA	-0.158166	0.037273	-4.243482	0
OITI	0.026482	0.05019	0.527639	0.5981
FCTI	0.885084	0.328314	2.695846	0.0073
NITI	-4.022411	12.79567	-0.314357	0.7534
IITI	-0.36553	0.134352	-2.72069	0.0068
NLTA	-0.007788	0.006067	-1.283664	0.2
LA	0.247749	0.070432	3.517568	0.0005
R-squared	0.123637			
Adjusted R-squared	0.10509			
S.E. of regression	0.129467			
Log likelihood	246.5793			
F-statistic	6.666008			
Prob(F-statistic)	0			

Table 4.13, reports the income and asset diversification on bank risk of South Asian countries. First study analysis diversification of income, in diversification of income the coefficient of (OITI) is 0.02 and insignificant the level of ($P>0.05$) which mean that other income to total income does not impact on risk of bank. The coefficient of (FCTI) is 0.88 and significant at level of ($P<0.05$) mean that fee and commission significant/positively effect on bank risk, when (FCTI) increase the bank risk increase due to positive and significant relationship.

While 2nd part is asset diversification on bank risk on South Asian countries.

The coefficient of equity to asset (EA) is -0.8 and significant at level of ($P<0.05$) mean that there is negative relationship between (EA) and bank risk but impact on each other due to p value. The coefficient of (OLTA) is –0.15 and significant at level of ($P<0.05$) mean that there is negative relationship between (OLTA) and

bank risk but impact on each other due to p vale is significant.

The coefficient of (NLTA) is -0.007 and insignificant at level of (P>0.05) mean relationship between them is negative and does not impact on each other. The coefficient of (LA) is 0.24 and significant at level of (P<0.05), mean that (LA) is Significant positive effect on bank risk, when increase in (LA) increase in bank risk due positive and significant relationship between them. The adjusted R square is 10% in this model which include product diversification (both income and asset) determine show only 10% impact on bank risk and profit of South Asian countries banking.

Study turns to analysis the elements income activities. Of this kind of investigation is essential for the reason that banks are provide opportunity to produce income from different sources as a result of such kind of activities bring various kind of risk income of banks streams. Separate regression is estimate use the income elements recognized in segment measurement of diversification for example (FCTI), (OITI) and (NITI). **Table: 4.13**, the fee and commission variable enter the Model of regression is positive plus significant coefficient while dependent variable is standard return on equity (SROE). Evidently Banks showing to fee and commission considerable to increase profit risk as well solvency risk. The results is reasonable due to capital and emerging markets working in the region of South Asian be able to extremely perceptive to regional and global shocks to bring instability in a banks income streams that engage in fee and commission activities. Study fails to find consistence evidence to suggest that other income to total income and non-interest income to total income significance influence on both profit and solvency risks. The interest income to total income has significant influence on profit and solvency risk. Study result are in agreements of influence on income acuities have different risk on banks activities (Abedifar et al. 2018; DeYoung and Torna 2013).

While return to loan categories study analysis the loan categories different effect on risk on banks of South Asian countries. This investigation is essential because deregulatory environment banks that may be allowed to a variety of customers through unusual measure of credit risk. Loan has two categories in this section

(loan to asset and other loans) both are significant influence association among banks performance in countries of South Asian countries which more profitable and more leading activities (Chiorazzo et al. 2008; Stiroh & Rumble, 2006, Gurbuz, Yanik, & Ayturk, 2013). The bank size in (SROE) which is negative and insignificant, it means that is inversely the performance of larger banks contain better due to opportunities diversification.

4.5.1 Fixed Effect Model (ROA)

TABLE 4.14: Fixed Effect Model (ROA)

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	0.006044	0.00353	1.712305	0.0877
EA	-0.00947	0.006804	-1.391942	0.1648
OLTA	-0.004946	0.001193	-4.146607	0
OITI	0.002728	0.001606	1.698592	0.0902
FCTI	0.034794	0.010506	3.31178	0.001
NITI	0.098611	0.409462	0.24083	0.8098
IITI	-0.007297	0.004299	-1.697242	0.0905
NLTA	-0.00037	0.000194	-1.906071	0.0574
LA	0.008349	0.002254	3.704169	0.0002
R-squared	0.11299			
Adjusted R-squared	0.094217			
S.E. of regression	0.004143			
Log likelihood	1578.64			
F-statistic	6.01883			
Prob(F-statistic)	0			

Secondly study investigates the return on asset diversification between considerable bank behavior on income and asset diversification and bank risk for profit and solvency the banks South Asian region. On behalf of income actives are classify

four broad (IITI), (NITI), (FCTI), (OITO).

While asset portfolio is categorized by equity to asset (EA), other loan to total asset (OLTA), and nature logarithm to total asset (NLTA) and loan to asset (LA). The combine effect of income and asset activities is captured by HHI income and HHI asset respectively.

Table 4.14, reports the income and asset diversification on bank risk of South Asian countries. First I analysis diversification of income, in diversification of income the coefficient of (OITI) is 0.002 and insignificant the level of (P>0.05) which mean that other income to total income does not impact on bank risk. The coefficient of (FCTI) is 0.03 and significant at level of (P<0.05) mean that fee and commission significant/positively effect on bank risk, when (FCTI) increase the bank risk increase due to positive and significant relationship.

The coefficient (NITI) is 0.09 and insignificant at level of (P>0.05), which mean that non-interest income to total income dose not impact on bank risk. The co-efficient (IITI) is -0.007 and insignificant al level of (P>0.05) mean that there is negative relationship between on (IITI) and bank risk, and dose not impact on each other because of P value.

While 2nd part is asset diversification on bank risk on South Asian countries.

The coefficient of equity to asset (EA) is -0.009 and insignificant at level of (P>0.05) mean the relationship is negative between (EA) and bank risk, and does not impact on each other due to p value.

The coefficient of (OLTA) is –0.004 and significant at level of (P<0.05) mean that there is negative relationship between (OLTA) and bank risk but impact on each other due to p vale is significant. The coefficient of (NLTA) is -0.0003 and signif-icant at level of (P<0.05) mean relationship is negative between them as well as also effect on each other.

The coefficient of (LA) is 0.008 and significant at level of (P<0.05), mean that (LA) is Significant positive effect on bank risk, when increase in (LA) increase in bank risk due positive and significant relationship between them. The adjusted R square is 9% in this model which include product diversification (both income and asset) determine show only 9% impact on bank risk and profit of South Asian

countries banking.

Study turns to analysis the elements income activities. Of this kind of investigation is essential for the reason that banks are provide opportunity to produce income from different sources as a result of such kind of activities bring various kind of risk income of banks streams. Separate regression is estimate use the income elements recognized in segment measurement of diversification for example (FCTI), (OITI) and (NITI).

Table 4.14, the fee and commission, OITI enter the Model of regression is positive plus significant coefficient while dependent variable is standard return on equity (SROE). Evidently Banks showing to fee and commission considerable to increase profit risk as well solvency risk.

The results is reasonable due to capital and emerging markets working in the region of South Asian be able to extremely perceptive to regional and global shocks to bring instability in a banks income streams that engage in fee and commission activities.

Study fails to discover consistence confirmation to advise that non-interest income to total income significance influence on both profit and solvency risks. The interest income to total income has significant influence on profit and solvency risk. Study result are in agreements of influence on income acuities have different risk on banks activities (DeYoung & Torna, 2013 ; Abedifar et al., 2018).

While return to loan categories study analysis the loan categories different effect on risk on banks of South Asian countries. This investigation is essential because deregulatory environment banks that may be allowed to a variety of customers through unusual measure of credit risk.

Loan has two categories in this section (loan to asset and other loans) both are significant influence association among banks performance in countries of South Asian countries which more profitable and more leading activities (Chiorazzo et al., 2008, Stiroh & Rumble, 2006, Gurbuz et al., 2013).

The bank size which is negative and significant, it mean that is inversely the performance of larger banks contain better due to opportunities diversification.

In this analysis return on asset effected by the bank diversification with different

proxies.

4.6 Random Effect Model (ROE)

TABLE 4.15: Random Effect Model (ROE)

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	0.126074	0.124718	1.01087	0.3127
EA	-0.909046	0.223745	-4.062866	0.0001
OLTA	-0.164854	0.045859	-3.594824	0.0004
OITI	0.012012	0.055235	0.21747	0.828
FCTI	1.113625	0.356314	3.125403	0.0019
NITI	-1.918415	12.88173	-0.148925	0.8817
IITI	-0.240466	0.143691	-1.673496	0.0951
NLTA	-0.00621	0.006948	-0.893773	0.372
LA	0.288576	0.076057	3.794197	0.0002
R-squared	0.115172			
Adjusted R-squared	0.096445			
S.E. of regression	0.124612			
F-statistic	6.150182			
Prob(F-statistic)	0			

Table: 4.15, (SROE) shows the results of product diversification on bank risk of South Asian countries using the panel regression analysis. All the coefficient of in-dependent variables are mostly significant relationship with dependent variable, except three variables (OITI, NITI, NLTA). The value of adjusted R square show that 9% variation occurred in dependent variable is explained by independent variable.

4.6.1 Random Effect Model (ROA)

TABLE 4.16: Random Effect Model (ROA)

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	0.004978	0.004061	1.225664	0.2211
EA	-0.012052	0.007257	-1.660791	0.0976
OLTA	-0.005257	0.001501	-3.501547	0.0005
OITI	0.003079	0.001796	1.714951	0.0872
FCTI	0.041525	0.011571	3.588784	0.0004
NITI	0.146748	0.416965	0.351945	0.7251
IITI	-0.00401	0.004664	-0.85974	0.3905
NLTA	-0.000406	0.000227	-1.793017	0.0738
LA	0.009782	0.002471	3.959331	0.0001
R-squared	0.104627			
Adjusted R-squared	0.085677			
S.E. of regression	0.003994			
F-statistic	5.521307			
Prob(F-statistic)	0.000001			

Table:4.16, (SROA) shows the results of product diversification on bank risk of South Asian countries using the panel regression analysis. All the coefficient of in-dependent variables are mostly significant relationship with dependent variable, except four variables (EA, OITI, NITI, IITI). The value of adjusted R square show that 8% variation occurred in dependent variable is explained by independent variable.

Chapter 5

Conclusion and Recommendation

5.1 Conclusions

The current study examines the influence of income diversification and asset diversification on the profitability and stability of south Asian commercial banks. Applying GMM methodology for 27 commercial banks from south Asian countries over the period 2000 to 2014. The result indicates that those banks could increase their profitability with additional diverseness i.e. taking interest and non-interest income as their income generation ways. The study has also tested the influence of bank size, loan ratio, and equity ratio on the profitability of bank.

Study divided income diversification for (SROE) to fee and commission, non-interest income, other income, and interest income. Study examined that fee and commission, and other income has positive effect on the profitability and stability of south Asian countries commercial banks, though interest income to total income and non-interest income to total income has a negative effect. These outcomes recommend that diverse kinds of non-interest income making activities have different impact on bank performance and stability.

While in asset diversification for (SROE) loan to asset has positive influence on the performance and stability of south Asian countries commercial banks, while other loan, equity to asset and nature logarithm of asset has a negative impact.

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The results suggest for bank size, equity ratio that bigger banks have more opportunities to enlarge their profitability by diversifying their income as contrast to little but in loan ratio it is opposite that larger banks have additional occasions as compare to lower capital growth level banks.

Study divided income diversification for (SROA) to fee and commission, non-interest income, other income, and interest income. Study found that fee and commission, other income and non-interest income has positive influence on the bank performance and stability of south Asian countries commercial banks, while interest income to total income has a negative effect. The outcomes recommend that diverse kinds of non-interest income producing activities have dissimilar impact on bank performance and stability.

While in asset diversification for (SROE) loan to asset has positive influence on the profitability and stability of south Asian countries commercial banks, while other loan, equity to asset and nature logarithm of asset has a negative impact. The results suggest for bank size, equity ratio that bigger banks have additional facilities to enlarge their bank profitability by diversifying their income as compare to small but in loan ratio it is opposite that bigger banks have additional opportunities as compare to small banks.

According to the study objectives the first objective was examine the impact of income diversification on bank risk. So, in this study we found that diversification of the income greatly influencing the bank risk section. The second objective of the study was examining the influence of asset diversification on commercial banking risk factor. So, the finding of our research prove that diversification of the assets highly influences the banking risk factor.

5.2 Policy Recommendation

Our result has important implication for manager and regulators in the banking industry in south Asian and other developing countries. Banks that are still engaged in only interest- generating activities can recruit non-interest-generating and other actions to reap the benefit from developing tendencies in the industry

in directive to compete with their peers. Banks that are already engaged in both interest and non-interest income granting activities can sensibly improve their non-interest portfolio into other income avenues except of only fees and commission. The current study encourages for the benefit for the financial institution by retaining the best mechanism in banking sector. Therefore, study provide the excellent benefit to banking institutions small and large size and governments and how they bring improving in their product diversification and consider by policy makers for future ahead. Whereas, all other policy makers, stakeholders, that can take a beneficial measure in governance sector. Including conventional banking sectors, board of directors, audit committee members, shareholders and general public to study the product diversification.

5.3   Future Directions

Additional study can be conducted to test the segregated effect of non-interest income sources on the performance of bank. Data set for larger period and banks with ownership segregation can also be tested to improved their results. This study has a limited sample size. This study can be done in a multi country setting by taking a large sample size which can brooder overview on the product diversification.

Bibliography

A Penrose, E. (1959). The Theory of the Growth of the Firm: Basil Blackwell, London, 4(3), 120-134.

Abedifar, P., Molyneux, P., & Tarazi, A. (2018). Non-interest income and bank lending. *Journal of Banking & Finance*, 4(1), 87-96. 411-426.

Acharya, V. V., Hasan, I., & Saunders, A. (2006). Should banks be diversified? Evidence from individual bank loan portfolios. *The Journal of Business*, 79(3), 1355-1412.

Ahamed, M. M. (2017). Asset quality, non-interest income, and bank profitability: Evidence from Indian banks. *Economic Modelling*, 63(1), 1-14.

Amihud, Y., & Lev, B. (1981). Risk reduction as a managerial motive for conglomerate mergers. *The Bell Journal of Economics*, 6(3), 605-617.

Baele, L., De Jonghe, O., & Vander Vennet, R. (2007). Does the stock market value bank diversification? *Journal of Banking & Finance*, 31(7), 1999-2023.

Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9(1), 3-18.

Berger, A. N., Demsetz, R. S., & Strahan, P. E. (1999). The consolidation of the financial services industry: Causes, consequences, and implications for the future. *Journal of Banking & Finance*, 23(4), 135-194.

Berger, A. N., DeYoung, R., Genay, H., & Udell, G. F. (2000). Globalization of financial institutions: Evidence from cross-border banking performance. *Brookings-Wharton Papers on Financial Services*, 2000(1), 23-120.

Berk, J. B., & DeMarzo, P. M. (2007). Corporate finance: Pearson Education, 34(12), 104-124.

Boot, A. W., & Schmeits, A. (2000). Market discipline and incentive problems in conglomerate firms with applications to banking. *Journal of Financial Intermediation*, 9(3), 240-273.

Boyd, J. H., & Graham, S. L. (1988). The profitability and risk effects of allowing bank holding. Federal Reserve Bank of Minneapolis. *Quarterly Review-Federal Reserve Bank of Minneapolis*, 12(2), 3-14.

Chiorazzo, V., Milani, C., & Salvini, F. (2008). Income diversification and bank performance: Evidence from Italian banks. *Journal of Financial Services Research*, 33(3), 181-203.

Craigwell, R., & Maxwell, C. (2006). Non-interest income and financial performance at commercial banks in Barbados. *Savings and Development*, 8(3), 309-328.

De Jonghe, O. (2010). Back to the basics in banking? A micro-analysis of banking system stability. *Journal of Financial Intermediation*, 19(3), 387-417.

De Jonghe, O., Diepstraten, M., & Schepens, G. (2015). Banks' size, scope and systemic risk: What role for conflicts of interest? *Journal of Banking & Finance*, 61(1), S3-S13.

DeLong, G. L. (2001). Stockholder gains from focusing versus diversifying bank mergers. *Journal of Financial Economics*, 59(2), 221-252.

Demsetz, R. S., & Strahan, P. E. (1997). Diversification, size, and risk at bank holding companies. *Journal of money, credit, and banking*, 7(2), 300-313.

Deng, S., & Elyasiani, E. (2008). Geographic diversification and BHC return and risk performance. *Journal of Money, Credit and Banking*, 40(6), 1217-1238.

DeYoung, R., & Rice, T. (2004). Noninterest income and financial performance at US commercial banks. *Financial Review*, 39(1), 101-127.

DeYoung, R., & Roland, K. P. (2001). Product mix and earnings volatility at commercial banks: Evidence from a degree of total leverage model. *Journal of Financial Intermediation*, 10(1), 54-84.

DeYoung, R., & Torna, G. (2013). Nontraditional banking activities and bank failures during the financial crisis. *Journal of Financial Intermediation*, 22(3), 397-421.

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427-465.

Freund, S., Trahan, E. A., & Vasudevan, G. K. (2007). Effects of global and industrial diversification on firm value and operating performance. *Financial Management*, 12(3), 143-161.

Goetz, M. R., Laeven, L., & Levine, R. (2013). Identifying the valuation effects and agency costs of corporate diversification: Evidence from the geographic diversification of US banks. *The Review of Financial Studies*, 26(7), 1787-1823.

Gurbuz, A. O., Yanik, S., & Ayturk, Y. (2013). Income diversification and bank performance: Evidence from Turkish banking sector. *Journal of BRSA Banking and Financial Markets*, 7(1), 9-29.

Haq, M., & Heaney, R. (2012). Factors determining European bank risk. *Journal of International Financial Markets, Institutions and Money*, 22(4), 696-718.

Hasan, I., Saunders, A., & Acharya, V. V. (2002). Should banks be diversified? Evidence from individual bank loan portfolios: *Bank for International Settlements*, 54(22), 130-144.

Huang, L.-W., & Chen, Y.-K. (2006). Does bank performance benefit from non-traditional activities? A case of non-interest incomes in Taiwan Commercial Banks. *Asian Journal of Management and Humanity Sciences*, 1(3), 359-378.

Iskandar-Datta, M., & McLaughlin, R. (2007). Global diversification: Evidence from corporate operating performance. *Corporate Ownership and Control*, 4(4), 228-242.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2), 323-329.

Jensen, M. C., & Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of Political Economy*, 98(2), 225-264.

Koehn, M., & Santomero, A. M. (1980). Regulation of bank capital and portfolio risk. *The Journal of Finance*, 35(5), 1235-1244.

Köhler, M. (2014). Does non-interest income make banks more risky? Retail- versus investment-oriented banks. *Review of Financial Economics*, 23(4), 182-193.

Kwast, M. L. (1989). The impact of underwriting and dealing on bank returns and risks. *Journal of Banking & Finance*, 13(1), 101-125.

Laeven, L., & Levine, R. (2007). Is there a diversification discount in financial conglomerates? *Journal of Financial Economics*, 85(2), 331-367.

Lakonishok, J., & Shapiro, A. C. (1984). Stock returns, beta, variance and size: an empirical analysis. *Financial Analysts Journal*, 40(4), 36-41.

Lee, C.-C., Yang, S.-J., & Chang, C.-H. (2014). Non-interest income, profitability, and risk in banking industry: A cross-country analysis. *The North American Journal of Economics and Finance*, 27(1), 48-67.

Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). Bank income structure and risk: An empirical analysis of European banks. *Journal of Banking & Finance*, 32(8), 1452-1467.

Mahajan, A., Rangan, N., & Zardkoohi, A. (1996). Cost structures in multinational and domestic banking. *Journal of Banking & Finance*, 20(2), 283-306.

Männasoo, K., & Mayes, D. G. (2009). Explaining bank distress in Eastern European transition economies. *Journal of Banking & Finance*, 33(2), 244-253.

Markides, C. C., & Ittner, C. D. (1994). Shareholder benefits from corporate international diversification: Evidence from US international acquisitions. *Journal of International Business Studies*, 25(2), 343-366.

Merton, R. C. (1977). An analytic derivation of the cost of deposit insurance and loan guarantes an application of modern option pricing theory. *Journal of Banking & Finance*, 1(1), 3-11.

Meslier, C., Tacneng, R., & Tarazi, A. (2014). Is bank income diversification beneficial? Evidence from an emerging economy. *Journal of International Financial Markets, Institutions and Money*, 31(1), 97-126.

Mishra, D. S. P., & Sahoo, D. (2012). Operational diversification and stability of financial performance in Indian banking sector: A panel data investigation. *Research Journal of Finance and Accounting*, 3(3), 70-87.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2005). Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. *The Journal of Finance*, 60(2), 757-782.

Molyneux, P., Lloyd-Williams, D. M., & Thornton, J. (1994). Competitive conditions in European banking. *Journal of Banking & Finance*, 18(3), 445-459.

Montgomery, C. A. (1994). Corporate Diversificaton. *Journal of Economic Perspectives*, 8(3), 163-178.

Pennathur, A. K., Subrahmanyam, V., & Vishwasrao, S. (2012). Income diversification and risk: Does ownership matter? An empirical examination of Indian banks. *Journal of Banking & Finance*, 36(8), 2203-2215.

Rose, P. S. (1989). Diversification of the banking firm. *Financial Review*, 24(2), 251-280.

Schertler, A., Buch, C. M., & von Westernhagen, N. (2006). Heterogeneity in lending and sectoral growth: evidence from German bank-level data. *International Economics and Economic Policy*, 3(1), 43-72.

Schmid, M. M., & Walter, I. (2009). Do financial conglomerates create or destroy economic value? *Journal of Financial Intermediation*, 18(2), 193-216.

Stiroh, K. J. (2004). Diversification in banking: Is non-interest income the answer? *Journal of Money, Credit, and Banking*, 36(5), 853-882.

Stiroh, K. J., & Rumble, A. (2006). The dark side of diversification: The case of US financial holding companies. *Journal of Banking & Finance*, 30(8), 2131-2161.

Villalonga, B. (2000). An empirical analysis of diversification motives. *Unpublished manuscript, University of California, Los Angeles*, 26(13), 10-28.

Williams, B. (2016). The impact of non-interest income on bank risk in Australia. *Journal of Banking & Finance*, 73(1), 16-37.