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RESEARCH ARTICLE

INCOME STRUCTURE AND INSOLVENCY RISK OF BANKS

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ABSTRACT

The aim of this study is to theoretically investigate the relationship between interest and noninterest income impact on insolvency risk of banks. The study reveals that in case of U.S banking and financial holding companies, the relationship between noninterest income is positive but at certain level of diversification, is beneficial for banks. Whereas, in case of E.U countries noninterest income is beneficial for profitability and it reduces insolvency risk. These results are similar to the studies which are conducted on Asian and Emerging economies. The paper aims to find out the policy implication for diversification but it depends on regions and countries.

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INTRODUCTION

Since seventies and in eighties financial regulation in western banking has been started, the banking system observed inclination in competition, concentration and restructuring of the system because of financial liberalization and regulation. So, the banks were to adopt new environment by using proactive approach by widening their range of products and offering new services to the clients. This strategy mainly influences the change in non-interest income and its profit. Noninterest income is attached not only with the traditional line of services like, checking, management of cash, letter of credit, but also new sources to generate income. So, with the reduction in interest income and higher competition, banks started to charge higher fees on current and new services (cash with drawl, bank account management and data processing, etc). Thus the sources of bank income have changed dramatically in both Europe and USA. In eighties, the proportion of noninterest income in U.S commercial banks was 19% of total income. Whereas, this share grew to 43% by the year 2001 (Stiroh, 2004). In Europe, the share of non-interest income increased to 41% from 26% between the years 1989 to 1998 (ECB, 2000). The Gramm-Leach-Bliley Act of 1999 was introduced in U.S which eliminated any type functional barriers between investment banking and commercial banking system and allowed U.S banking system to engage in more range of financial services. By the implication of this act banks adopted securitization model in which bank not only allocate funds to lending activities but also to security investments. So as a result, a new banking model gave rise to declined need of traditional services of banks but also presence of higher systematic risk and need of more regulatory reforms (Cetorelli and Peristiani, 2012; Claessens and Ratnovski, 2013; Apergis, 2014). In European Union (the Second Banking derivatives, 1989) was introduced to eliminate the barriers in banking system and banks started to involve in some other nontraditional lines of business. Furthermore, the Asian financial crises changed the course of banking system. The system converted from more controlled system to more liberalized system (Gochoco-Bautista *et al*., 2000).

In contrast to some of the previous researcher, DeYoung and Torna, (2013) highlighted some of the positive side of GLB (Gramm-Leach-Bliley) Act. GLB allowed the bank to change the bank business model to some other income diversifications. For example, in U.S the share of noninterest income boosted to 44% of total operating income in the year 2003, which is against 35 % of 1993 and 24% of 1983. This movement to get away from traditional interest business was made by new innovation in the field of information communication, financial technologies and became necessary because of the competition posed by some other financial institutions and markets for lending and deposits. The de-regularization by GLB actually reduced the share of banking system in the economy of financial assets but banks retained the cash flows which were associated with those assets like lending of loans, guaranteeing

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loans, servicing of loan, and some other services in exchange for fee income. GLB not only supported this transition but also allowed banks to switch to nontraditional banking services. After introduction of European Union, the Second Banking Derivatives, in early 1990s the banking industry of Italy moved from interest income to non-interest income services. Although this became a reason of higher profit in Italy banking system but there were few ambiguities with reference to the effect of this procedure overall banking system (Chiorazzo *et al*., 2008). According to Brunnermeier, Dong and Palia (2012), noninterest income activities not only include services charges on traditional line of business but also trading income, income for securities, investment banking, advisory fees, commission, venture capital, brokerage fees, gains on non-hedging derivatives and fiduciary income. The services of generating income are different from traditional business of lending. In these service banks, has expanded their market to other capital market intermediaries for example, mutual funds, hedge funds, insurance companies, investment banking and private equity fund and those markets which do no deal with federal deposit insurance.

Pozsar *et al*. (2010) highlighted that the nontraditional line of bank business can include items such as, investment banking, advisory fee and some other services, which are totally different from gathering of deposit and lending function of bank. The nontraditional line of business increases the profit but they are also source of systemic risk, both directly and through interconnectedness with the traditional line of business. So, higher level of diversification in banking system make it complex and hence agency problem may arise. Banks has diversified their sources of income by performing nontraditional activities such as trading of securities, underwriting agreements, brokerage and investment banking and some other activities which actually generates noninterest income. The effects of such changes has been addressed on profit and risk in developed countries such as U.S and Europe but no consensus has been made. Whereas, most of the previous studies has argued that non interest activities are associated with profitability but it poses higher risk due to its unstable nature (Stiroh, 2004a, 2004b, 2006; Stiroh and Rumble, 2006; Lepetit *et al*., 2008). There are very few studies on emerging countries, for example Sanya and Wolfe, (2011), Pennathur *et al*. (2012) and Nguyen *et al*. (2012) have investigated the impact of non-traditional activities on risk and profitability and somehow find different results. In the region of Asia, the banking system had been formerly depicted by substantial and ascendant family retained business with their particular financial subsidiaries. The implication of these family owned and large scale corporation was that they used to serve internal markets confines of their companies, as a result permitting them to avoid restriction on these firm specifically on offshore capitalization. There had been very important roles played by the governments of numerous Asian countries, with reference to banking freehold companies and financing the banks to coordinate the loaning towards national development systems (Williams and Nguyen, 2005). So with regards to monetary deregulation, the banking system of many countries changed, regularly connected with expanded competition, concentration and reorganization. So, most of the banks responded quickly to the change in environment by receiving new proactive strategy and they expanded the scope of items offered to their customers. The banks also started to gain the potential benefits of financial conglomerates to enhance the cross-selling ability, which allowed to sell multiple financial product to the same customer (Baele *et al*., 2007).

So, the aim of the current paper is to asses theoretically the impact of noninterest or nontraditional income on risk by review the previous researches. The study tries to seek the consensus of noninterest or non-traditional activities on insolvency risk. There are numerous studies on U.S and European banking system. Whereas, there are few studies on Asian and developing countries. This paper seeks the similarities of results in different banking systems of different economies. The remaining section of the paper are organized as follow: Section 2, review of literature and empirical evidences from difference economies, Section 3, defines the methodology that can be implement using data of the banking system of any country, and it also defines the variables, Section 4 reviews the finding of results obtained by previous authors, and Section 5 includes the concluding remakes.

Review of Previous Literature

There is a large stream of previous literature that focuses on factors and causes of bank failure. The key purpose behind suchlike researches is to develop an early warning system that may identify risk of banks and intimation of banks failure for corrective action. The data used in such studies are from the banks which were failed during the years late 1980 to early 1990s. For example, Thomson (1991), Whalen (1991), Cole and Gunther (1995), Wheelock and Wilson (2000), DeYoung (2003), Oshinsky and Olin (2006) and Schaeck (2008). The investigations have developed model for early warning and prediction of bank failure by using nonperforming loans (Asset Quality), lending to real estate, high concentration of business, ill-liquidity problems, cost inefficiency, bad management, low equity capital and low profitability. The studies also included the determinants like prompt asset development, heavy dependence on non-core deposits subsidies. From theoretical point of view, the decision of diversification of income sources has been good together for efficiency and risk management. The mutual expansion of extensive array of financial products mustrise efficiency of bank and economy of scope (Klein and Saidenberg1997). Thus, in general point of view, it has been understood that variation of income sources which are shifted from interest income towards noninterest income must be lessened to aggregate risk. The benefit of diversification should also enhance the profitability of the bank. So, the idea is that the activities of interest and noninterest income are thought of uncorrelated or may be perfectly correlated, with those that generates interest income. So diversification should stabilize operating income and help to produce more stable stream of profit (Chiorazzo *et al*., 2008).

The stream of literature highlighted the need for financial institutions to get involved in other kind of non-traditional activities as it has potential of gains. Myers and Rajan (1998) explained the use of different asset mix portfolio as an explanation of banking institution tendency to involve in activities which are not based on traditional line of banking system. They further explained that these activates can cause manager to trade against the interest of the bank. Cornett *et al*. (2002) and Deng *et al*. (2007) argued that non-traditional activities on one aspect reduce the cost of debt. Whereas, Mester (2010) was in support to the previous argument highlighted that due to involvement in nontraditional activities bank experience higher economy of scale, while the bank is

forced to refrain from such activities which may cause unintended consequences. There are numerous studies which explains the impact of noninterest income on stability of bank and risk. Among many previous studies (e.g., Litan, 1985; Wall, 1987; Kwast, 1989; Gallo *et al*., 1996; Uzun and Webb, 2007; Jiangli and Pritsker, 2008) highlighted that the tendency of bank to expand its services in nontraditional activities, for example underwriting, securities, brokerage and asset securitization, to help the bank in diversification of risk partially. But later more recent studies argue that nontraditional activities increase risk. Furthermore, Allen and Jagtiani (2000) finds that the involvement of bank in such nontraditional activities like securities and insurance activities not only increase insolvency risk but also interest rate risk. Furthermore, DeJonghe (2010) shows that the banks which have intensive noninterest incomes tend to show higher tails of betas, so non-interest income is more sensitive than interest income to macroeconomic swings and market change. Consistent with the previous argument, fee based income from retail banking are pro-cyclical in nature (Clark *et al*. 2007). Elyasiani and Wang (2008) reported that banks and banks holding companies which produce larger amount of income from fee based are less transparent to the investor. While, it is also highlighted by Demirguc-Kunt and Huizinga (2010) that diversification in income at certain level in noninterest income has gains but if the banks strategies are more relying on generating noninterest income are risky.

The negative side of noninterest income has been viewed by many researchers. Among many Stiroh (2004a,b) and Stiroh and Rumble (2006) investigated the small U.S banks which diversify their income, either came across the gains of diversification of nontraditional activities or not. The results of the studies revealed that the impact of non-traditional activities has negative impact on performance of the bank. Whereas in case of U.S financial holding companies' non-traditional income contributes substantially in deteriorating risk profile. Laeven and Levine (2007) highlighted that involving in nontraditional activities do no bring benefits for example, higher return, resource efficiency and economy of scope and scale but it entices to agency problem among different groups of these institution stakeholders and produce negative implication to both risk and profitability. Schmid and Walter (2009) documented that the banking sector if expands its functions to nontraditional activities leads to value discount but if it has the combination of commercial banking and insurance activities or commercial banking and investment banking it do not create value discount. In contrast, DeYoung and Torna (2013) highlighted that the certain component of non-traditional income items, for example fee based income do no reduce the value of a healthy bank but it reduces the value of bank if the bank is a financially distressed. Gambacorta and van Rixtel (2013) argued that nontraditional income of the bank does no increases the profitability of the bank, it does not lower volatility of income and reduces risk, while if there is any benefit from these activities, it is related to geographical and diversification of loan portfolio. The empirical examination by Fiordelisi and Marques-Ibanez (2013) who supported that the positive impact of diversification is only limited to certain geographical areas as well as loan portfolio diversification. Whereas, the study didn't produce clear results relative to the impact of nontraditional activities on bank risk. In particular Baele *et al*. (2007) investigate the longer run benefit of nontraditional activities of a banking institution. Their results are mixed as they indicated the positive effect on the value of institution and nonlinear effect on risk profiles which leads to lower risk adjusted returns. In contrast, in the case of Italian banking system, Chiorazzo *et al*. (2008) finds that the diversification of income improves the risk and return trade off and such gains of diversification is stronger in larger banks. Whereas, in case of small European banks, the diversification of income is not beneficial, higher gains from non-interest income is associated to lower profitability and increased risk. Specifically, trading activities are more risky and unprofitable (Mercieca *et al*., 2007). Berger *et al*. (2010) investigated the maximum dimensions such as deposits, geography, loans and assets of income assortment. These dimension are higher in cost and also reduces profits. Moreover, they also revealed that, the banks with foreign ownership and those involved in conglomerates had have small diseconomies of diversification. So, foreign banks and conglomerate diversification helps to reduce risks. In the empirical examination by DeYoung and Roland (2001) taking data of 472 U.S commercial banks for the period starting from 1988 to 1995, finds that on average most of the banks has based their noninterest income on fee based activities rather than traditional lending activities. Due to this the volatility of earning of the bank and their degree of financial and operating leverage along with earning increases. The results imply that all three results have increased volatility of earning and risk premium.

In another study of Stiroh (2004b), who investigated the U.S banking system between the years 1984 to 2001. The result of the study revealed that in banking industry the level of correlation between interest and non-interest income growth has increased in the year 1990s. Moreover, it was also observed that noninterest income is more volatile in nature than interest income. Furthermore, there was a decrease of operating revenue volatility, which was observed in 1990s can be due to the declining volatility of interest income. Finally, Stiroh finds that, non-interest income is negatively associated with risk adjusted return at bank level. In case of U.S financial holding companies, Stiroh and Rumble (2006) highlighted that there is no link between performance and diversification of income. Whereas, there is a negative relationship between performance and noninterest income of the bank. The study was based on the data for the years between 1997 to 2002. Brunnermeier, Dong and Palia, (2012) documented the study for the period of 1986 to 2008 on U.S financial institutions. The study highlighted that higher involvement of non-interest income like investment banking, trading activities and others noninterest activities, produces higher contribution to risk than traditional deposit and lending activities. They also revealed that separately, venture capital, investment banking equally contributes to the risk. Whereas, the banks which were involved more on trading income before recession period earned less in the period of recession, but no such evidence was enabled in investment banking and venture capital. DeYoung and Torna, G. (2013) tested the banking activities, they examined that nontraditional strategies of bank either subscribe towards non-success of various U.S commercial banks or not. The results were based on logit model, indicated that the prospect of collapse of a distress bank diminished along with fee based noninterest strategies for example securities, insurances sale and brokerage. But on the other hand, the probability of failure has expanded with resource based nontraditional exercises like the venture capital, asset securitization and the investment banking. Moreover, banks which are involved in risky nontraditional lines of business

tends to make riskier their traditional interest based activities. They also suggested that de-regularization was not adequate condition for a bank disappointment amid the catastrophe. Goal of an empirical study of Apergis (2014), was to empirically determine the effect of non-traditional activities on risk profiles of financial institution which are involved in certain activities. The study used the data set ranging from year 2000 to 2013 covering 1725 U.S financial institution which were involved in nontraditional line of business. The author applied the methodology of co-integration. The author documented results of the study highlighted that nontraditional activities of banks exerts positive impact on both insolvency risk and profitability. The author further argue that the results were important for regulator as they could server as prewarning system of a potential risk which is existed in the market.

The results were somewhat different in case of Europe. The European Central Bank (2000) Conducted as survey to examine the experience of various EU countries for the period of 1989 to 1998. The survey was having multiple point of examination, along those it was highlighted that composition of noninterest income is much heterogeneous in EU banks and found that this part of operating income is more dynamic. The results revealed that noninterest income has played a vital role in the progress of profitability for EU banks, whereas apparently there has been a reverse cross sectional relationship amongst interest and non-interest income. In same period, the survey likewise found that the interest income has been more volatile in EU countries as compare to U.S, whereas non-interest income has demonstrated more unpredictability in European countries than U.S banking system. Similar results were highlighted by Maudos and Solis (2009) that in Mexican banking system there has been negative relationship amongst noninterest income and interest income. In another study of Smith *et al*. (2003) analyze the volatility of noninterest and inters income and their correlation for 15 European Union countries banking system during the years between 1994 to 1998 period. For every country, the author considered, saving, mortgage, commercial and cooperative banks in the sample to correlate the interest and noninterest income. The study revealed the results in contrast to the U.S banking system that more reliance on noninterest banking activities has stabilized the profit in European Union counties.

In contrast to the previous studies on European banking system. Lepetit, Rous and Tarazi, A. (2008) investigated the results on the relationship between risk of the bank and product diversification in many European countries banking industries. The data set for the study they used was ranged between 1996 to 2002. The results of the study highlighted that the banks which have expanded its line of business to non-interest income strategies have greater insolvency risk as compared to the banks remained in traditional line of business. However, the authors further categorized the banking strategies into fee, trading and commission and find the positive link amongst risk and the noninterest income for small-scale banks. Whereas, trading income has not been linked with higher risk for small banks but can affect on lower asset and is similar in case of Italian banking system. The author Chiorazzo, Milani, and Salvini, (2008) Studied the link between noninterest and profitability. The result of the study revealed that diversification in noninterest income increase the risk adjusted returns. The study on Italian banking system supports the finding of European banks literature however is not supporting the outcomes on U.S. Furthermore, the study highlighted that the relationship of noninterest income and profitability is stronger in larger bank. in addition, there are limits to no interest income gains specifically larger banks but small banks can gain benefits from diversification of income. In case of Asian banking system, the results are somewhat similar to EU banking system. Lin *et al*. (2012), used switching regression model and categorized the banks into managements of low and high level of income modification. The study took the countries of Asia (Chania, India, Indonesia, Japan, Philippines, Singapore, South Korea, Taiwan and Thailand) and data from the year 1997 to 2005.The study document the results that interest income is less sensitive to volatility in diversified income banks in contrast to specific traditional line of business of banks. So, it implies, by diversifying the income causes a bank can lessen the shocks to interest income and reduce risk. It can only be harvested if the bank has low level of diversification.

A panel data infestation for the effect of income diversification on insolvency risk for 322 bank across 22 emerging economies by using Generalized Method of movement by Odesanmiand Wolfe (2007). The aim of the study was to empirically document the results of shift towards noninterest income and diversification of noninterest and interest income on impact on insolvency. The primary results of the study revealed that diversification in both interest and noninterest income decreases the insolvency risk of the banks. The effect of diversification remains intact even the reliance on noninterest income increases. So the result in emerging economies was in contrast to the western U.S banking system. Nguyen *et al*. (2012) also focuses the case of South Asian emerging economies to assess the benefits of diversification of income. the author documented the influence of market control on the divergence of income and risk relationship of bank. The results highlighted that the if market power is greater, than the insolvency risk is reduced even if the banks is involved in nontraditional line of business. Whereas on the contrary, Berger *et al*. (2010) found proof of the variation discounts, the results revealed that discounts of diversification are stronger in domestic banks as compared to foreign bank in Chinese banking system. The author further highlighted that in Chinese banking system the discount effect is due to lake of management expertise of top management or may be ineffective incentives for management to maximize the wealth of shareholder.

In case of Philippines banking system, empirical examination was performed by Meslier *et al*. (2014). The study was to find the impact of diversification of revenue and performance of the banks. The results were in contrast to the western banking system. In Philippine banking system increase in the noninterest income increases the profit and reduce the risk. Specifically, while the banks have been further indulged in trading strategies with government securities. Whereas the benefit was more for overseas banks as compared to local banks. The results further documented that the benefits prevail for the banks income diversification if they are less involved in SME loaning. The recent trend in Indonesian banking system is the diversification of revenues, they are shifting the lines of business towards noninterest income activities. So, the study of Hidayat, Kakinaka, and Miyamoto (2012) examines the effect of diversification of income with bank risk for the period of 2002 to 2008. The result of the study underscore that the diversification of product mix and income is much dependent

on the size of the bank assets. Specifically, in small banks the diversification has been obstructively in relation to the banks risk. Whereas, degree of relationship of product and income diversification in large banks has a positive association with the bank risk. The author further noticed that de-regularization encourages the banks in order to get further association in nontraditional strategies which can produce severe consequence on the banking system of Indonesia. Indeed, large Indonesian banks can play a significant role in Indonesian Banking system. India is one of the leading economy in South Asian region. The banking sector of India is one of the biggest in the region. So, in case of Indian banking system, Pennathur *et al*. (2012) examined the impact of ownership on diversification of income and risk for the period from 2001-2009 for Indian banking system. The aim to find the determinants of noninterest income and insolvency risk measure for public, private, foreign and domestic banking system. In composition of noninterest income, private domestic banks of India earn less noninterest income than public sector banks while foreign bank based more on fee based income than the counterparts. The public sector banks of India mostly owned by government are less likely to produce noninterest income while fee based income of public banks reduced the insolvency risk. Thus, default rate is also reduced for such banks. So, for Indian banking system the diversification is benefiting the banking sector of India. hence, on the basis of literature review the impact of noninterest income and interest income on insolvency risk is mixed in nature. Still there is no consensus have been made on the relationship. The result can further be obtained for other economies of Asia like, Afghanistan, Iran, Nepal, Pakistan, Brunei Darus Salam and others.

METHODOLOGY

The methodology of the such analysis will be quantitative in nature. The panel data test analysis should be performed. The model can be zero effect, fixed effect or random effect based on Redundant and Hausman test. The econometric model can be,

Insolvency Risk = Function of (Interest Income, NoninterestIncome)
Noninterest income = f(VC,AB,SC,CON,FEB,INCI,INCA, BI,IB,SERC,NONHED,FI,Others)

Whereas

VC = Venture Capital
AB = Asset Based
CON = Conglomerates with insurance companies
FEB = Fee bases Service Income
INCI = income from Investment
INCA = Income from Advances
BI = Brokerage Income
BI = Investment Banking,
SERC = Service Charges on non-interest income
NOHED = No hedging income
FI = Judiciary Service charges income

According to Williams and Prather (2010) the accouting measure can have the denominator in one fo the following

- Total Assets
- Shareholder's Equity.

So, by using all these variables or some mix of these income to check the impact of noninterest income on insolvency an econometric model can be developed based on the hypothesis and objective of research.

Review of findings

According to DeYoung and Roland (2001)further cited by Lepetit, Nys and Tarazi, A. (2008), there are three main reason which are involved in volatility of noninterest income of a bank. which are as follow, A bank may lose a client which is providing bank a fee based income, because a client is not bounded for long run relationship like loaning. Even though over a longer period of time if considered, the fluctuation of interest rate and economic downturn do not destabilize the traditional line of business. The reason is because the relative cost of information and switching to a client is high which do not allow a client to walk away from a lending relationship.

1. There is also a need of heavy investment if a bank tries to shift from interest based activities to noninterest based activities. The investment need both in technology and human resource. So, this increase the operating leverage and volatility of earning.
2. Fee based income do not have any regulatory capital or any collateral for security, so this actually tends towards high level of financial leverage and hence results in high earning volatility.

The finding of DeYoung and Roland (2001) is limited to the studies made on U.S banking system. As they are not applicable in EU and Asian banking system. There are studies which defines that noninterest income increase the profitability and decreases the insolvency risk. Furthermore, Apergis, N. (2014) argue that nontraditional activities have positive impact on both profitability and risk profiles of banking system. Whereas, the author further notified that the components of nontraditional or noninterest income do not have any unified behavior across all such activities. So the finding of the author is mixed in nature as some of the component may or some may not be improving profit and reducing insolvency. According to Acharya *et al*. (2013) argued that the limited involvement of a bank in non-interest income can reduce risk and increase the profitability, the gains are more it the diversification of revenue of such institute is limited in noninterest income. Whereas, the author further focus on the business line in which management can gain clear advantage rather investing in nontraditional line. The main focus should be toward the regulatory body to properly develop the regulation for nontraditional line of business. The study of the author does not define the limit of noninterest income or the threshold up till then a bank can involve in noninterest or nontraditional line of business. In case of Italian banking system, the suggestive results were clearly defining that there is a positive effect of noninterest income to profitability, and it is beneficial in reducing risk and increasing the profit (Chiorazzo *et al*., 2008). The study on Italian banking system do not define the link of noninterest income and profit and also with insolvency. The study also does not define the component of noninterest income which is more involved in improving profitability and reducing insolvency. In the wake of economic crisis, the nontraditional activities have meaningful effect on probability of bank failure, even if the determinant of insolvency which are already defined in previous studies. It is also dependent on the financial position of the bank. Whereas, most part of

nontraditional income has no effect on bank failure or it do not produce any benefit for the bank in the reign of crisis (DeYoung and Torna, 2013). So, nontraditional income has nothing to do with financial crisis as it neither beneficial nor decreasing the risk of the bank. The effect of financial crisis is based on the health of a bank prior to crisis. Nontraditional income also cannot provide a prior signal before crisis.

Summary of Finding and Conclusion

The implication of noninterest income can be for policy making and research. The first should be, if it is possible that the fee based line of income should be separately reported of each type, rather they are aggregated into singe variable of non-interest income or fee based income. For example, it can be defined as fee for service, traditional or stakeholder's sources of noninterest income. The second can be, if economic downturn is on its way the management or supervisors of banks may take proactive action to mix the product diversification of bank to gauge insolvency risk, specifically for distressed firms. Third the de-regularization was the opportunity; it has nothing to do with bank failure in financial crisis. While, GLB act of 1999 provide opportunities to the bank to take risk but to diversify its sources of income. They should expand its products, so that risk can be minimized (DeYoung and Torna, 2013). There is a positive relationship of diversification with insolvency risk bank, and specifically for small bank. Whereas in all bank the fee based income activities have a direct impact on insolvency while trading income does not affect insolvency much. So engaging in trading activities may diversify risk for smaller banks (Lepetit *et al*., 2008). There is a policy implication for regulatory bodies as they may assess the types of fee based income which are directly effecting the insolvency risk of the banks. The proactive approach may be taken for noninterest income and regulation may be developed.

The results of previous studies are mix in nature as Angbazo (1997) suggested that if a bank is in low degree of diversification the risk coefficient can be predicted. Whereas, this conclusion cannot confirm if the bank is in a greater level of distress. Moreover, the previous researches are indecisive in nature, regarding the relational impact of income diverseness on risk. For example, Baele *et al*. (2007) argued that most of the banks engage in income diversification to reduce risk and increase risk adjusted returns. While Lepetit *et al*. (2007), highlighted that, higher reliance on noninterest income activities will produce higher shocks, because interest income is less sensitive in nature as compared to noninterest income. So based on the previous literature and empirical evidences, it can be seen the effect of noninterest income on risk a profitability is somewhat inconclusive. In case of U.S the effect of noninterest income on risk is positive, whereas in EU and Asian countries the effect of noninterest income is negative and beneficial for the bank. The study of non-interest income can further be done on countries like Afghanistan, India, Philippines and Pakistan so that the results can further make and insight on the relationship (Meslier *et al*., 2014). Furthermore, it can be deduced form previous literature finding that, region of the banks matters in case of interest income effect on insolvency. So therefore, regulatory bodies have an implication that proper region based studies may be conducted and regulation may be developed. There is also a policy implication for bank supervision and management incentives. Thus, financial authorities of different countries must monitor the behavior of large banks related to various insolvency risk factors including credit risk, operation risk, liquidity risk under the umbrella of Basel Accord frame work.

REFERENCES

Acharya, V., Schnabl, P., Suarez, G., 2013. Securitization without risk transfer. *J. Financ. Econ*., 107, 515–536.

Apergis, N. 2014. The long-term role of non-traditional banking in profitability and risk profiles: Evidence from a panel of US banking institutions. *Journal of International Money and Finance*, *45*, 61-73.

Baele, L., DeJonghe, O., Vennet, R.V. 2007. Does the stock market value bank diversification? *J. Bank. Financ*., 31, 1999–2023.

Cetorelli, N., Peristiani, S., 2012. The role of banks in asset securitization. Econ. Policy Rev., 47–63. Federal Reserve Bank of New York.

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

Claessens, S. and Ratnovski, L. 2013. What is Shadow Banking? Voveu.org

Clark, T., Dick, A., Hirtle, B., Stiroh, K.J. and Williams, R.,2007. The role of banking in the US banking industry: risk, return and industry structure. Fed. Reserve Bank New York Econ. *Pol. Rev*., 13, 39–56.

Cole, R., Gunther, J., 1995. Separating the likelihood and timing of bank failure. J. Banking Finance 19, 1073–1089

Cornett, M.M., Ors, E. and Tehranian, H., 2002. Bank performance around the introduction of section 20 subsidiary. *J. Financ*., 52, 501–521.

DeJonghe, O. 2010. Back to the basics in banking? A micro-analysis of banking system stability. *J. Finan. Intermediation*, 19, 387–417.

Demirguc-Kunt, A. and Huizinga, H., 2010. Bank activity and funding strategies: the impact on risk and returns. *J. Finan. Econ*., 98, 626–650.

Deng, S., Elyasiani, E. and Mao, C. 2007. Diversification and the cost of debt of bank holding companies. *J. Bank. Financ*., 31, 2453– 2473.

DeYoung R. and Roland KP 2001. Product mix and earnings volatility at commercial banks: Evidence from a degree of leverage model. *J FinancIntermed*., 10(1):54–84 (January)

DeYoung, R. 2003. The failure of new entrants in commercial banking markets: a split-population duration analysis. *Rev. Finan. Econ*., 12, 7–33.

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

Elyasiani, E. and Wang, Y. 2008. Non-Interest Income Diversification and Information Asymmetry of Bank Holding Companies. Unpublished Manuscript, FMA. <http://www.fma.org/Texas/Papers/BHC_Diversification_ Asymmetric.pdf>.

European Central Bank, 2000. EU banks' income structure. Banking Supervision Committee, April.

Fiordelisi, F. and Marques-Ibanez, D. 2013. Is bank default risk systematic? *J. Bank. Financ*., 37, 2000–2010.

Gallo, J.G., Apilado, V.P. and Kolari, J.W. 1996. Commercial bank mutual fund activities: implications for bank risk and profitability. *J. Banking Finance*, 20 (2), 1775–1791.

Gambacorta, L. and van Rixtel, A. 2013. Structural bank regulation initiatives: approaches and implications. *BIS Working Paper*, No. 412

Gochoco-Bautista, S., Oh, S.-N. and Rhee, S.G. 2000. In the eye of the Asian financial maelstrom: banking sector reforms in the Asia-Pacific region. In: Rising to the Challenge in Asia: A Study of Financial Markets: Volume 1 – An Overview. *Asian Development Bank, Manila*, pp. 50–106

Hidayat, W. Y., Kakinaka, M. and Miyamoto, H. 2012. Bank risk and non-interest income activities in the Indonesian banking industry. *Journal of Asian Economics*, *23*(4), 335-343.

Jiangli, W. and Pritsker, M. 2008. The Impact of Securitization on US Bank Holding Companies. Unpublished Manuscript. SSRN: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1102284>.

Klein PG. and Saidenberg MR 1997. Diversification, organization, and efficiency: evidence from bank holding companies." Working Papers 97–27, Wharton School Center for Financial Institutions, University of Pennsylvania, February

Laeven, L. and Levine, R. 2007. Is there a diversification discount in financial conglomerates? *J. Financ. Econ*., 85, 331–367.

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

Lin, J. R., Chung, H., Hsieh, M. H. and Wu, S. 2012. The determinants of interest margins and their effect on bank diversification: Evidence from Asian banks. *Journal of Financial Stability*, *8*(2), 96-106.

Litan, R.E. 1985. Evaluating and controlling the risks of financial product deregulation. *Yale J. Regul*., 3, 1–52.

M. K., Dong, G. N. and Palia, D. 2012. Banks' non-interest income and systemic risk. In *AFA 2012 Chicago Meetings Paper*.

Maudos, J. and Solis, L., 2009. The determinants of net interest income in the Mexican banking system: an integrated model. *Journal of Banking and Finance*, 33, 1920–1931.

Mercieca, S., Schaeck, K. and Wolfe, S., 2007. Small European banks: benefits from diversification? *Journal of Banking and Finance,* 31, 1975–1998.

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

Mester, L. 2010. Scale economies in banking and financial regulatory reform. Region, 10–13. Federal Reserve Bank of Minneapolis.

Myers, S.C. and Rajan, R.G., 1998. The paradox of liquidity. *J. Financ*., 113, 733–771.

Nguyen, M., Skully, M. and Perera, S., 2012. Market power, revenue diversification and bank stability: Evidence from selected South Asian countries. *Journal of International Financial Markets, Institutions and Money,* 22, 897–912.

Odesanmi, S. and Wolfe, S. 2007. Revenue diversification and insolvency risk: Evidence from banks in emerging economies. *Social Science Research Network*.

Oshinsky, R. and Olin, V. 2006. Troubled banks: why don't they all fail? *FDIC Banking Rev*., 18, 23–44.

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

Pozsar, Z., Adrian, T., Ashcraft, A.B. and Boesky, H. 2010. Shadow Banking. Staff Report No. 458. Federal Reserve Bank of New York.

Sanya, S. and Wolfe, S. 2011. Can banks in emerging countries benefit from revenue diversification? *Journal of Financial Services Research*, 40, 79–101.

Schaeck, K. 2008. Bank liability structure, FDIC loss, and time to failure: a quantile regression approach. *J. Finan. Services Res*., 33, 163–179

Schmid, M.M. and Walter, I. 2009. Do financial conglomerates create or destroy economic value? *J. Financ. Intermed*., 18, 193–216.

Smith R, Staikouras, C. and Wood, G. 2003. Non-interest income and total income stability. Working Paper 198, Bank of England, August

Stiroh KJ. and Rumble, A. 2006. The dark side of diversification: the case of U.S. financial holding companies. *J Bank Financ*., 30(8):2131–2161 (August)

Stiroh, K.J. 2004a. Do community banks benefit from diversification? *J. Financ. Serv. Res*., 25, 135–160.

Stiroh, K.J. 2004b. Diversification in banking: Is noninterest income the answer? *J. Money Credit Bank,* 36, 853–882.

Stiroh, K.J. and Rumble, A. 2006. The dark side of diversification: the case of US financial holding companies. *J. Bank. Financ*., 30, 2131–2161.

Stiroh, K.J., 2006. New evidence on the determinants of bank risk. Journal of Financial Service Research 30, 237–263.

Thomson, J. 1991. Predicting bank failures in the 1980s. *Fed. Reserve Bank Cleveland Econ. Rev*., 27, 9–20.

Uzun, H., Webb, E. 2007. Securitization and risk: empirical evidence on US banks. *J. Risk Finan*., 8 (1), 11–23.

Wall, L.D. 1987. Has bank holding companies' diversification affected their risk of failure? *J. Econ. Bus*., 39, 313–326.

Whalen, G. 1991. A proportional hazards model of bank failure: an examination of its usefulness as an early warning tool. *Fed. Reserve Bank Cleveland Econ. Rev., First Quarter*, 20–31.

Wheelock, D.C., Wilson, P.W. 2000. Why do bank disappear? The determinants of U.S. bank failures and acquisitions. *Rev. Econ. Statist*., 82, 127–138.

Williams, B. and Prather, L. 2010. Bank risk and return: the impact of bank non-interest income. *International Journal of Managerial Finance, 6*(3), 220-244.

Williams, J. and Nguyen, N. 2005. Financial liberalisation, crisis and restructuring: a comparative study of bank performance and bank governance in South East Asia. *Journal of Banking and Finance,* 29, 2119–2154.

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