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## **Risk and performance of non-bank financial institutions**

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**Abstract:** This study examines the risk levels of Non-Bank Financial Institutions (NBFIs) and their effect on performance. A panel data analysis of 42 NBFIs over the period of 2006–2010 is used for the study. The results show that NBFIs have been safe as far as bankruptcy is concerned, over the period under study. The risk index used as a measure of overall risk levels show a high mean risk level suggesting that the risk of insolvency of NBFIs in Ghana has been low. The results of the study also establish that lower risk levels lead to an increase in performance of NBFIs. It is further shown that the size of NBFIs has a positive relationship with performance. The results also show that further increases in size of NBFIs measured as the squared of size has a positive impact on performance.

**Keywords:** NBFIs; non-bank financial institutions; risk; performance; financial services management.

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## 1 Introduction

Risk is one of the enthralling challenges facing most financial institutions in recent times. Many financial institutions have failed due to risks which were not managed efficiently. In Ghana, the Non-Bank Financial Institutions (NBFIs) industry complements the main stream banking institutions to provide financial services to customers. The increasing importance of the NBFIs industry coupled with global economic crisis in recent years has made it necessary to ascertain the risk levels of these institutions as well as the impact of risk on their performance.

Since the promulgation of the NBFI's law (PNDCL 328) in 1993, NBFIs have grown from 4 in 2004 to 48 registered institutions as in February 2011. According to Psillaki et al. (2010), as institutions in an industry increase their activities become risky and Schumpeter (1911) attributes this to competition amongst these institutions to perform better. Since NBFIs are already into activities that are risky, more competition increases further the risk which they are exposed to.

Bloom and Milkovich (1998) define risk as the possibility of an adverse event occurring and its negative impact on firms. Gupta (2004) also states that risk refers to the

possibility of deviation from the standard path and these deviations reduce the value of the firm and implies unhappy situations. Both definitions point to the fact that there are two sides to risk but the downside is what institutions are mostly concerned about.

To ensure that shareholder value is maximised, risk must be optimally managed by firms. Over the years many economies have collapsed due to problems in the financial services sector. The Dot.com crashes in the early 2000s and the 2007–2009 financial crises have all caused indelible blow to the financial systems of many countries. These situations call for proper risk management strategies that could help manage risk optimally. Extant literature suggests an overwhelming impact of risk on the performance of financial institutions. Research however is inconclusive on the relationship between financial institutions performance and their risk-taking behaviours. Amidst the rising controversy surrounding the importance of risk management practices of financial institutions, assessing the effect of the risk on the performance of NBFIs makes a study as this a necessity. Odonkor et al. (2011) did a study on bank risk and performance in Ghana but since these institutions are different with respect to the business they do and are also regulated differently from banks by the Bank of Ghana, it is important to ascertain the impact of risk on their performance. This has also been made imperative due to apparent lack of studies in this area. The objectives of this research are to ascertain the risk levels of NBFIs and also the impact of risk on their performance in Ghana. The rest of the paper is organised as follows. Section 2 gives a review of the extant literature on the subject. Section 3 discusses the methodology. Section 4 presents and discusses the results of the empirical analysis. Finally, Section 5 concludes the discussion.

## **2 Overview of literature**

Risk over the years has proved to be devastating in the financial world once it occurred. The Dot.Com crash in the late 1990s, where internet companies dominated the stock market, the long-term capital management crisis also known as the Asian crisis in the late 1990s involving hedge funds, the crash of the US stock market in 1987, the Savings and Loans scandal and the current US sub-prime debacle and the ensuing financial crisis have all caused indelible havoc to the financial system (France, 2010). The role of financial intermediaries such as NBFIs is to channel savings to investors. As competition declines firms can earn more rents on their loan markets by charging higher interest on the loans (Odonkor et al., 2011). Higher loan rates would imply higher bankruptcy risk for bank borrowers (Boyd and De Nicolo, 2004).

Firm risk is illustrated by portfolio theory (Donaldson, 1999), as a new model of performance-driven organisational change in which risk plays central role. As Donaldson states further, to understand whether an organisation is likely to make adaptive changes or not, and whether it is likely to grow or not, we need to understand its degree of risk. The stock market downturns in 2000 and 2001 have created the awareness that it is not only the level of firm financial performance that counts but also the underlying risk of the financial or any other industry (Orlitzky and Benjamin, 2001). From a managerial, practical perspective, today's managers will not only be concerned with possible predictors and consequences of financial performance levels but also of their variability (i.e. firm risk). Executives' ability to manage firm risk can make the difference between future bankruptcy and organisational health. Over the long run the market and events in

the environment are going to penalise behaviour that increases firm risk. Both principals and agents are likely to be concerned about the degree of risk incurred by their firm (Bloom and Milkovich, 1998).

With regard to the impact of risk-taking incentives on the performance of financial institutions, a review of literature indicates that there is a dearth of literature in relation to NBFIs. We, however, review literature in relation to the impact of the risk-taking incentives on the performance of banks since both banks and NBFIs operate in similar fashion.

Firm risk may not only increase because of increasing probability of civil legal proceedings, minimal legal proceedings or both, but it may also increase because of the increasing likelihood of regulatory intervention by the government if firms do not proactively engage in socially responsible actions (Odonkor et al., 2011). According to Bettis and Thomas (1990), low risk may allow for better planning because low firm risk makes projections of a firm's future cash flows more certain. Due to that Odonkor et al. (2011) postulate that managers in low risk firms face less uncertainty with respect to future opportunities and opportunity cost concerning performance. Smithson and Simkins (2005) found that lower risk levels increase firm value. Financial institutions including NBFIs should institute measures that would reduce their risk exposure significantly.

Carey and Stulz (2005) suggest that many financial institutions have substantial franchise value that could be lost if they are viewed as being too risky. Merton (1993) emphasised that risk management is uniquely important for financial institutions because in contrast to firms in other industries, their liabilities are a source of wealth for their shareholders. They further give an instance where a financial institution that writes long-dated derivatives would usually be shut out of the market if the credit rating of the vehicles it uses to write such derivatives fell below an A rating. Because its franchise value depends on its risk, a financial institution has an optimal level of risk that maximises its value for shareholders and this assertion is corroborated by Odonkor et al. (2011). Risk maximisation is never optimal because there cannot be franchise value without taking risks, so the firm always faces costs and benefits when its risk level increases (Carey and Stulz, 2005).

Odonkor et al. (2011) examined the effect of risk on bank performance using a panel data of 18 banks for a period of 12 years between 1997 and 2008. They were able to show that lower risk levels lead to an increase in bank performance. The study also establishes that size when interacted with risk, bigger banks could accommodate more risk leading to higher performance.

Also, Epure and Lafuente (2012) examined bank performance in the presence of risk for Costa-Rican banking industry during 1998–2007 and find that performance improvements follow regulatory changes and that risk explains differences in banks. Ben-Naceur and Omran (2008) in attempt to examine the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989 to 2005, find that bank capitalisation and credit risk have positive and significant impact on banks' net interest margin, cost efficiency and profitability.

In his study of the determinants of banks' performance for 12 countries selected from Europe, North America and Australia, Bourke (1989) notices a significant positive relation between capital adequacy and profitability. Bourke shows that the higher the capital ratio the more profitable a bank will be. Similarly, the study of Berger (1995) concludes that banks which are well-capitalised are more profitable than the others in the

USA. The positive relation between the capital ratio and profitability is not limited to the US banking industry. In the study of banking profitability across 18 European countries for the period 1986–1989, Molyneux and Thornton (1992) also find that the capital ratio impacts banks' performance positively although such relationship is confined to just the state-owned banks. Demirguc-Kunt and Huizinga (1999) conduct a more comprehensive study which examines the determinants of banking performance for 80 countries, both developed and developing, during the period 1988–1995. They conclude that foreign banks have higher profitability than domestic banks in developing countries, while the opposite holds in developed countries. Nevertheless, their overall results show support for the positive relationship between the capital ratio and financial performance.

Contrarily, Kithinji (2010) assessed the effect of credit risk management on the profitability of commercial banks in Kenya. The findings reveal that the bulk of the profits of commercial banks is not influenced by the amount of credit and non-performing loans; therefore, suggesting that other variables other than credit and non-performing loans impact on profits. Felix and Claudine (2008) investigated the relationship between bank performance and credit risk management. It could be inferred from their findings that Return on Equity (ROE) and Return on Assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to the total loan of financial institutions thereby leading to a decline in profitability. Al-Khouri (2011) assessed the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in six of the Gulf Cooperation Council (GCC) countries over the period 1998–2008 and the results show that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk.

### **3 Methodology**

This section specifies the model for the empirical investigation. It also discusses the sample, the data sources and the variables used in the study.

#### *3.1 Sample and data source*

The study considers the NBFIs industry in Ghana as the population. Forty two (42) institutions out of the 48 registered with the Bank of Ghana as in January 2011 are selected. The target population is NBFIs that have been in existence for at least three years. Data covering the period 2006–2010 is used for the analysis. The institutions that are left out were due to non-availability of data covering the period under study. This research relies on secondary data based on the audited accounts of NBFIs as well as statutory returns on NBFIs submitted to the Bank of Ghana. Data on inflation are also sought from the database of the Ghana Statistical Service. Data on GDP are from the World Development Indicator Database and that of exchange rates from the Bank of Ghana database. Data on age of the institutions are from the database of BOG.

### 3.2 *Performance measures*

The headlines attest to return on assets (ROA) prominence as the accounting measure of overall bank performance and to the critical importance of loan quality in determining bank performance (Naïmy, 2005). Return on Equity (ROE) also measures profitability from the shareholders point of view. ROE measures accounting profits per dollar of book equity capital. It is defined as net income divided by total equity. According to Naïmy (2005), it can be decomposed into leverage factor or Equity Multiplier (EM) and ROA:

$$\text{ROE} = \text{ROA} \times \text{EM}$$

where

ROA = net income/total assets

EM = total assets/total equity. This provides a gauge of an institutions' leverage or the dollar amount of assets pyramided on the institutions' base of equity multiplier.

### 3.3 *Risk index*

For the construction of the risk index, the study employs the one suggested by Hannan and Hanweck (1988) and used by various other researchers such as Sinkey and Blasko (2001), Naïmy (2005), Rahman et al. (2009), Odonkor et al. (2011) and Ofoeda et al. (2012). To capture the overall risk of a financial institution, the variability of ROA provides a comprehensive measure that reflects not only credit risk but also interest rate risk, liquidity risk, operating risk and any other risk that is realised in the institutions earnings (Naïmy, 2005). The standard deviation of ROA is a good measure of the variability of ROA. CAP is often used as an indicator for risk in financial institutions because high levels of capital provide protection against large decline in income. Hence, better capitalised financial institutions will, other things being equal, incur less risk of insolvency. Combining ROA, CAP and the standard deviation of ROA provides the risk index. The empirical form of this index is

$$\text{RI} = (\text{ROA} + \text{CAP})/\sigma\text{ROA}$$

where

RI = risk index for the various institutions under study

ROA = return on assets for each institution each year

CAP = the inverse of the equity multiplier or capital to assets ratio.

$\sigma\text{ROA}$  = the standard deviation of ROA for all firms each year.

where

$$\sigma\text{ROA} = (\text{ROA} - \text{MeanROA})^2$$

Risk index expressed in units of standard deviations of ROA is a measure of how a bank's accounting earnings can decline until it has a negative book value. The risk index according to Naïmy (2005) is an appealing risk measure because it includes ROA; the most widely accepted accounting measure of overall bank performance. The variability of ROA is a standard measure of risk in financial economics and book capital adequacy

represents an industry standard for bank safety and soundness. It is expected that riskier firms would have lower risk index and safer firms would have higher risk index. This measure of risk takes into considerations all the risks that a firm is exposed to.

### 3.4 Econometric model

The literature on bank performance advances a number of factors that influence the performance of financial institutions, such as risk, age, size and macroeconomic factors. In line with the discussion of literature on financial institutions' performance, the study adopted a modified version of the model used by Odonkor et al. (2011).

$$PER_{i,t} = \alpha_0 + \beta_1 RI_{i,t} + \beta_2 Size_{i,t} + \beta_3 Size^2_{i,t} + \beta_4 RiSize_{i,t} + \beta_5 Age_{i,t} + \beta_6 Lev_{i,t} + \beta_7 RIR_t + \beta_8 Infrate_t + \beta_9 GDP_t + \mu_i + \varepsilon_t$$

where

- PER = performance of non-bank financial institutions (ROE) and (ROA). ROE is defined as net income divided by total equity and ROA is net income divided by total equity
- $\alpha_0$  = constant term
- RI = risk index
- Size = size of the firm is measured by log of total assets.
- $Size^2$  = the square of size
- RiSize = the interactive term between risk and size.
- Age = age of the firm measured by the number of years the institution has been in existence
- Lev = leverage measured by the debt to assets ratio
- RIR = real interest rate measured as the difference between nominal interest rate and inflation rate.
- Infrate = inflation rate measured by the annual inflation rate
- GDP = gross domestic product growth rate measured by the Statistical Service reported annual rate.
- $\mu$  = the error term
- $i$  = represents each of the individual NBFIs under study
- $t$  = time-specific effect.

### 3.5 Discussion of variables

We expect a positive relationship between the risk index and NBFi performance. An NBFi with low risk is likely to have greater credit availability which leads to the opportunity to increase the productive assets and NBFi's profit (Cebenoyan and Strahan, 2004).

We expect size which is measured by the logarithm of firm's assets to be positively or negatively related to performance. According to Psillaki et al. (2010), as larger firms are more diversified they tend to hold more assets than smaller ones. Larger firms tend to be better managed and have better organisational and financial structures in place. They are generally less vulnerable to normal business hazards or to economic downturns compared to smaller companies. Firm size is generally used to capture potential economies or diseconomies of scale in the financial sector. This variable controls for cost differences and product and risk diversification according to the size of the credit institution. The empirical results provide conflicting evidence. Smirlock (1985), Short (1979), Bikker and Hu (2002), and Ben-Naceur and Goaied (2008) find a positive and significant relationship between size and bank performance. On the other hand, Kosmidou et al. (2005) find that small UK banks display higher profitability than larger ones over the period 1998. Kasman (2010) found that size has a negative and statistically significant impact on the net interest margin on a panel of 431 banks in 39 countries. Size<sup>2</sup> is included to assess the existence of economies or diseconomies of scale in the NBFIs sector.

Age is measured as the number of years since the establishment of each NBFIs. It controls for years of experience of each NBFIs. This variable allows testing for the hypothesis that older, more experienced NBFIs perform better. An alternative hypothesis however purport that older institutions have had to learn practices by trial and error, whereas more recently established institutions may profit from the knowledge that has been built up in the past years and may come out to be better performers than their counterparts (Hermes et al., 2009). We therefore expect the sign of age to be ambiguous depending on what hypothesis dominates.

Leverage is expected to have a negative effect on performance. The extent of leverage is regularly used as an indicator of a company's ability to meet its long-term debt obligations and remain solvent (Psillaki et al., 2010). As a firm increases its debt ratio, the risk of default increases and therefore performance is negatively affected. Even though leverage (overall capitalisation) has been demonstrated to be important in explaining the performance of financial institutions, its impact on bank profitability is ambiguous. As lower capital ratios suggest a relatively risky position, one would expect a negative coefficient on this variable (Berger, 1995). However, it could be the case that higher levels of equity would decrease the cost of capital, leading to a positive impact on profitability (Molyneux and Thornton, 1992). Moreover, an increase in capital may raise expected earnings by reducing the expected costs of financial distress, including bankruptcy (Berger, 1995). Indeed, most studies that use capital ratios as an explanatory variable of bank profitability (see Bourke, 1989; Molyneux and Thornton; 1992; Goddard et al., 2004) observe a positive relationship. Finally, Athanasoglou et al. (2008) suggest that capital is better modelled as an endogenous determinant of bank profitability, as higher profits may lead to an increase in capital (Berger, 1995).

The real interest rate is also expected to have a positive relationship with profitability. In the essence of lend-long and borrow-short argument, institutions, in general, may increase lending rates sooner by more percentage points than their deposit rates. In addition, the rise in real interest rates will increase the real debt burden on borrowers. This, in turn, may lower asset quality, thereby inducing NBFIs to charge a higher interest margin in order to compensate for the inherent risk. Secondly, it is generally believed that a rising interest rate should lead to higher banking sector profitability by increasing the spread between the saving and the borrowing rates. Hanweck and Kilcollin (1984) find that this relationship is particularly apparent for smaller banks in the USA during the



1976–1984 periods. They notice that falling interest rates during recession lead to slower growth in loans and increase in loan loss. Consequently, banks, particularly the small ones, may have difficulty in maintaining profit as market rate drops. Further studies by Demircug-Kunt and Huizinga (1999), Staikouras and Wood (2003) and Cheang (2005) notice a positive relationship between interest rates and bank profitability.

The findings of the relationship between inflation and profitability are mixed. Although the studies of Guru et al. (2002) in Malaysia and Jiang et al. (2003) in Hong Kong show that higher inflation rate leads to higher bank profitability, the study of Abreu and Mendes (2000), nevertheless, reports a negative coefficient for the inflation variable in European countries. In addition, Demircug-Kunt and Huizinga (1999) notice that banks in developing countries tend to be less profitable in inflationary environments, particularly when they have a high capital ratio. In these countries, bank costs actually increase faster than bank revenues. High inflation is associated with higher costs as well as higher income. If an institutions income rises more rapidly than its costs, inflation is expected to exert a positive effect on profitability. On the other hand, a negative coefficient is expected when its costs increase faster than its income.

Economic growth (GDP), which is measured by the real GDP growth rate, is hypothesised to affect NBFIs' profitability positively. This is because the default risk is lower in upturns than in downturns. Besides, higher economic growth may lead to a greater demand for both interest and non-interest activities, thereby improving the profitability of NBFIs. This is because there will be a higher demand for bank credit in times of economic boom than in times of recession. A high aggregate growth rate may strengthen the debt servicing capacity of domestic borrowers, and therefore, contribute to less credit risk. Alternatively, adverse macroeconomic conditions hurt financial institutions by increasing the amount of non-performing loans. Thus, it is expected that an improvement in economic growth helps bank performance. Bourke (1989) presents evidence that economic growth, if particularly, associated with entry barriers to the banking market, would potentially lift banks' profits. Other studies that recognise the importance of market growth on banking performance include Guru et al. (2002), Gerlach et al. (2004), Bashir (2000) and Nier (2000).

## **4 Discussion of empirical results**

This section discusses the results of the empirical study. The study first presents the descriptive statistics of the various categories of NBFIs followed by the regression results.

### *4.1 Risk levels of NBFIs*

NBFIs in Ghana have had an averagely high risk index at (5.32) as shown in Table 1. This means that NBFIs have been safe between the period 2006 and 2010; thus their risk levels are low which may be attributed to good risk management practices. With the promulgation of the NBFIs Law (PNDC Law 328) in 1993 and also various measures taken by the Bank of Ghana, most of these institutions are under prudent supervision from the Bank of Ghana. The Bank of Ghana exercises a high degree of independence in regulating NBFIs' activities which may be a contributing factor in the high risk index they are recording. Measures undertaken by the Bank of Ghana include the inclusion of

the deposit taking NBFIs under the banking law of Ghana and also the quarterly reporting of NBFI's accounts to the supervisory division of Bank of Ghana in charge of NBFI's activities. These have contributed immensely to the efficiency of these institutions. The relatively strong capital position of the NBFIs is also a contributing factor.

Finance houses in Ghana in the period 2006–2010 had a positive average ROA of 0.0268 and a high capital to assets ratio (0.2481). Both measures of risk being the risk index and standard deviation of ROA indicate that finance houses have been safe in the years under review. Finance houses are not into deposit taking but their client base is usually made up of corporate firms and medium- to large-scale firms. The interest they charge is relatively high and they have very prudent ways of recouping the loans they give. They are less risky, probably because they deal with corporate customers who are considered to be good credit customers unlike savings and loans that deal with individual customers who are normally in the informal sector of the economy. This may account for their high risk index (5.65), which is higher than the industry average.

**Table 1** Mean risk level of NBFIs in Ghana 2006–2010

<i>Variables</i>	<i>All NBFIs</i>	<i>Finance Houses</i>	<i>Savings and Loans</i>	<i>Others</i>
ROA	0.0033	0.0268	−0.0239	0.0109
CAP	0.2433	0.2481	0.2773	0.1114
σROA	0.0463	0.0557	0.0452	0.0227
Risk Index	5.3288	5.6535	5.6062	5.4027

Notes: 1 ROA is net income/total assets; CAP is equity/total assets; σROA is the standard deviation of ROA; risk index is  $(ROA + CAP)/\sigma ROA$ .

2 Others refer to all other NBFIs used for the analysis other than Finance Houses and Savings and Loans Institutions.

Savings and Loans (S&Ls) companies also have a high risk index (5.60), which is also higher than the industry average. Though the average ROA between the periods under review is negative (−0.02), the high Capital to Assets Ratio (0.28) suggests that the S&Ls have been safe. The S&Ls are into deposit taking and are therefore under the banking supervisory laws. This means that the Bank of Ghana exercises control as far as risk-taking and risk management are concerned. The capital adequacy ratio of 10% might be a contributing factor to the high capital to assets ratio. This cushions them of the effect of any risk-taking activities. Since they take deposits, which are a cheaper source of short-term debt they are able to have a cheaper capital base.

Other NBFIs apart from Savings and Loans and Finance Houses (Leasing Firms, Mortgage Companies) also had a positive average risk index of (5.40), which means these categories of NBFIs have also been safe. Though the capital to assets ratio is smaller than the industry average, they had relatively high ROA and also the standard deviation of ROA is smaller. This means that these institutions have been applying good risk management practices in their business. The promulgation of the NBFI Law (PNDCL 328) and the promulgation of the Non-Bank Financial Institutions Business rules in June 2000 have all contributed to the high average risk performance index that these firms are experiencing.

In summary, the observations imply that NBFIs during the period 2006–2010 were operating at acceptable risk levels which can be attributed to the good management practices by the NBFIs and the sound regulatory practices on the part of Bank of Ghana.

#### 4.2 Correlation analysis

In order to evaluate possible degree of multi-collinearity among the regressors, we include a correlation matrix of all the variables presented in Table 2. The correlation analysis reveals high correlations between size and size squared. In order to deal with the multi-collinearity problem, we estimate two different model results taking into consideration the highly correlated independent variables.

#### 4.3 Regression analysis

In ascertaining the relationship between regulatory pressure and risk-taking, the fixed effects model is used in our estimation. The regression results on the effect of risk on performance (ROE and ROA) are shown in Table 3. Risk index shows a significant and positive relationship with NBFI performance for both ROA and ROE. This means that lower risk levels lead to an increase in NBFI performance. This is because a higher z-score indicates that the NBFI is more stable and safe and also lower capital ratio is an indication of higher risk-taking on the part of NBFIs. As the risk index is a 'safety index' a high index means a low bank insolvency risk exposure; thus the relationship between the independent variable (ROA and ROE) is reversed from the sign in the regression results in the table. The positive association with the risk index means that NBFI performance is inversely related to the risk exposure of NBFIs. This suggests that highly profitable NBFIs have high z-scores and are therefore less exposed to insolvency risk. This confirms theory because high profitability tends to cushion the NBFIs against the risk of failure. High profits indicate high owners' worth that means the firm is insulated against the risk of insolvency.

**Table 2** Correlation matrix for key independent variables

	<i>RI</i>	<i>SIZE</i>	$(SIZE)^2$	<i>AGE</i>	<i>LEV</i>	<i>RIR</i>	<i>INFRATE</i>	<i>GDP</i>
RI	1.0000							
SIZE	0.0069 [0.9439]	1.0000						
(SIZE) <sup>2</sup>	0.0125 [0.8826]	0.9989 [0.0000]	1.0000					
AGE	-0.2445 [0.0108]	-0.2663 [0.0034]	-0.2661 [0.0034]	1.0000				
LEV	-0.2750 [0.0009]	0.5283 [0.0000]	0.5182 [0.0000]	-0.0558 [0.5466]	1.0000			
RIR	-0.1056 [0.2112]	0.1879 [0.0180]	0.1874 [0.0184]	-0.1614 [0.0462]	0.1332 [0.0952]	1.0000		
INFRATE	-0.0617 [0.4511]	0.0289 [0.7187]	0.0387 [0.7018]	0.0284 [0.7276]	-0.0201 [0.0017]	-0.4279 [0.0000]	1.0000	
GDP	-0.0510 [0.5465]	0.0926 [0.2478]	0.0944 [0.2381]	-0.0711 [0.3823]	0.0484 [0.5457]	0.0701 [0.3119]	0.6665 [0.0000]	1.0000

Notes: Values in square brackets are probability values of significance level.

In addition, when NBFIs reduce their risk levels, there is greater credit availability because providers of funds find them safer for investment purposes which then leads to an increase in the productive assets and hence their profitability. The results show that for

NBFIs to increase their performance, one sure way is by reducing activities that increase their exposure to high risk. Activities which are not well managed may result in increasing the risk levels of NBFIs and reduce their credit availability. This may significantly cause a reduction in performance. This result is in line with other studies (see Ofoeda et al., 2012; Odonkor et al., 2011; Smithson and Simkins, 2005 and Cebenoyan and Strahan, 2004).

This is perhaps so in the Ghanaian context because about 91% of the sampled firms are expected to keep a minimum capital adequacy ratio of 10% suggesting that majority of NBFIs have enough capital buffers to cushion them against the risk of insolvency. However, they normally operate in the informal sector of the economy, allowing them to charge higher interest rates than the banks for credit facilities extended to customers. This leads to higher profit levels for NBFIs at a reduced risk level.

From Table 3, size is significant and positive as far as performance (ROE) is concerned. This suggests that larger NBFIs perform better than smaller ones. This finding is consistent with that of Psillaki et al. (2010), Odonkor et al. (2011), Smirlock (1985), Biker and Hu (2002) and Ben-Naceur and Goaeid (2008). Larger NBFIs have greater access to credit facilities because they have better asset base to use as collateral. Also, larger NBFIs have better diversification opportunities and thus have access to lower cost of funding than smaller ones. In addition, they exhibit relatively higher levels of net interest income and hence income. Larger NBFIs are more diversified and tend to fail less often than smaller ones. In addition, they tend to be better managed and have better organisational and financial structures in place which enhances their performance. And also, larger NBFIs may be generally less vulnerable to normal business hazards or to economic downturns than smaller NBFIs that have difficulties raising additional equity or securing external finance.

To cater for economies and diseconomies of scale, size was squared and it showed a significant positive relationship with performance (ROE). This suggests that as NBFIs increase in size, there is still the possibility of improved performance. This is possibly so, because the NBFI industry in Ghana is at its infant stages. Therefore, there is more room for them to expand and still make profits. Also, due to the keen competition in the Ghanaian financial services sector, larger NBFIs tend to control a larger portion of the industry's assets which translates into higher profitability. This, therefore, suggests that increasing the size of an NBFI will not hinder its performance but rather enhance its performance. This is, however, contrary to our a priori expectation of an inverse relationship between size squared and NBFI performance. As an NBFI increases in size to a certain level, the bureaucratic nature of its operations may have a toll on performance since simple business processes may take longer time to be completed and thus productivity is negatively affected.

The interaction between risk and size is significant and negatively related to performance (ROA and ROE). A further increase in size of NBFIs when interacted with risk lowers their performance. As financial institutions increase in size they are expected to take on more risk that would enhance performance but when this does not happen and larger NBFIs incur less risk, it negatively affects their performance since all things being equally larger firms are supposed to take on more risk than smaller ones. Odonkor et al. (2011) found similar results in their research on bank risk and performance. Bigger NBFIs are expected to accommodate higher risk as they increase their lending activities and improve their profitability, hence performance. This suggests that larger NBFIs which engage increasingly in less risk-taking are likely to reduce their performance.

Leverage measured by the debt to equity ratio is also significant and positive in relation to performance. This finding is consistent with studies by Bourke (1989); Molyneux and Thornton (1992) and Goddard et al. (2004) also found a positive relation between leverage and performance. The extent of leverage is regularly used as an indicator of a firm's ability to meet its long-term debt obligations and remain solvent (Psillaki et al., 2010). The positive relation with performance means that the debt levels of most of these NBFIs are not up to the optimal level and any further increase in debt based on the data used would bring an increase in performance. This means that there are more opportunities for NBFIs to take on more debt to help improve their performance.

**Table 3** Effect of risk on NBF performance

<i>Variables</i>	<i>ROE</i>	<i>ROE</i>	<i>ROA</i>	<i>ROA</i>
	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
Risk Index	1.6653 (5.80)***	1.6716 (5.76)***	0.5222 (4.71)***	0.5208 (4.67)***
Size	0.3997 (3.59)***		0.0591 (1.38)	
(Size) <sup>2</sup>		0.0261 (3.39)***		0.0031 (1.05)
Risize	-0.1125 (-2.91)***	-0.1121 (-2.87)***	-0.0343 (-2.31)**	-0.0335 (-2.24)**
Age	-0.1233 (-2.08)**	-0.1196 (-2.00)**	-0.0174 (-0.76)	-0.0155 (-0.68)
Lev	0.6486 (3.31)***	0.6885 (3.53)***	0.2313 (3.06)***	0.2432 (3.24)***
RIR	10.589 (1.93)*	10.533 (1.90)*	2.6462 (1.25)	2.6487 (1.24)
Infrate	4.2607 (1.72)*	4.2396 (1.70)*	1.0979 (1.15)	0.1041 (1.15)
GDP	0.0836 (1.87)*	0.0832 (1.84)*	0.0188 (1.09)	0.0188 (1.09)
Intercept	-5.5144 (-5.33)***	-4.0552 (-4.52)***	-1.3246 (0.00)	-1.0937 (-3.18)***
F(8,68)	13.65	13.27	8.13	7.95
Prob>F	[0.0000]	[0.0000]	[0.0000]	[0.0000]
R <sup>2</sup>	0.6163	0.6095	0.4853	0.4795
Observations	107	107	108	108

Notes: All regressions include a constant. Z-statistics are in parentheses. \*\*\*, \*\*, \* mean significant at 1%, 5% and 10% level of significance, respectively.

1 ROE is the net income to equity ratio; ROA is the net income to total assets ratio; size is the logarithm of total assets; Size<sup>2</sup> is the square of size; Risize is interaction between risk index and size; Age is the number of years the institution has been in existence; Lev is the debt to equity ratio; RIR is interest rate minus inflation; Infrate is the annual inflation rate and GDP is the annual gross domestic product growth rate.

2 The risk index is a safety index, a high index means a low NBF insolvency risk exposure, thus the relationship between the bank insolvency and performance is reversed from the sign in the table.

Age which represents the number of years an NBFIs has been in existence has a significant negative relationship with performance (ROE). This implies that younger NBFIs tend to perform better than their older counterparts. This is because younger NBFIs are more aggressive and more innovative in their operations. More also, older institutions have to learn practices by trial and error, whereas more recently established institutions may profit from the knowledge that has been built up in the past years and may come out to be better performers than their counterparts. This is consistent with findings of Hermes et al. (2009) but contrary to other studies (see Petersen and Rajan, 1997 and Niskanen and Niskanen, 2006)

The study further finds a positive relationship between interest rate and NBFIs performance (ROE). This suggests that in times of rising interest rates, NBFIs tend to perform better. Generally, the financial services sector is helped rather than hindered in times of rising interest rates. This is because a chunk of the income made by these institutions is from interest income. Therefore, higher interest rates denote higher interest income for NBFIs and therefore an increase in profitability. In addition, in Ghana, the interest rate spread is very wide suggesting that an increase in interest rates means more earnings for NBFIs. This was corroborated by Short (1979) who found a positive relationship between nominal interest rates and return on capital.

Also, there exists a positive relationship between inflation and performance (ROE) of NBFIs in Ghana. This means that NBFIs tend to perform better in times of rising inflation rates. This is expected because interest rates will adjust quickly upwards when inflation is rising which is an indication of increasing interest income. This therefore translates into increased profitability for NBFIs in times of higher inflation rates. This is in line with Guru et al. (2002) and Jiang et al. (2003).

Finally, the study explored the relationship between GDP levels and NBFIs performance. The study found a positive relationship between GDP levels and NBFIs' performance (ROE) which is consistent with our a priori expectations. Generally, higher economic growth encourages NBFIs to lend more and permits them to charge higher margins while improving the quality of their assets. This is because during boom seasons, firms have more positive net present value projects they would want to undertake and this leads to an increase in their loan demand since they need financing to undertake these projects. The upsurge in loan demand results in higher interest margins for the financial institutions which in turn results in higher NBFIs profitability. Also, as the economy is doing well, the loan quality of NBFIs too is improved because their clients also have improved cash flows which enable them to make good their loan payments. This improved loan repayment results in less loan loss provision and this eventually enhances the profitability of the banks. This result is confirmed by studies done by Demircuc-Kunt and Huizinga (2001) and Bikker and Hu (2002). However, Ben-Naceur (2003) finds no impact for the economic growth on bank's profitability.

## **5 Conclusions and implications**

This study examined the relationship between risk and performance of NBFIs in Ghana. The results of the study indicate that NBFIs are generally safer and this translates into better performance. The relevance of the findings lies in the fact that risk plays an important role in NBFIs performance. Risk management should be within the purview of risk managers as well as the Central Bank. Monitoring NBFIs activities closely to ensure

that lending practices do not compromise risk reduction must be pursued aggressively. This can be achieved by closely monitoring and inspecting NBFIs' lending practices and off-balance sheet activities. We conclude from the findings of the study that prudent risk management practices or lower risk-taking incentives on the part of Ghanaian NBFIs lead to a significant increase in their performance.

The implication of this paper is that performance of NBFIs is influenced by their risk-taking incentives, size, capital ratio, size, real interest rates as well as the macroeconomic conditions prevailing in the country. Therefore, managers of NBFIs must take into consideration these factors in their management policies because they have the ability to significantly influence their performance. In addition, regulatory authorities should take into consideration the impact of the risk-taking activities of NBFIs on their performance and embark on more close inspection and enforcement of regulations. These actions will go a long way to help improve the performance of the NBFI sector which would aid in strengthening the financial system of the country.

Following from these findings, it would be useful to consider for future studies, the influence of NBFIs' risk-taking on performance in other African countries. Future studies should also consider other measures of risks in order to further our understanding on the issues developed in this paper.

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