

Universitat de Lleida

Essays on bank internal governance and credit risk

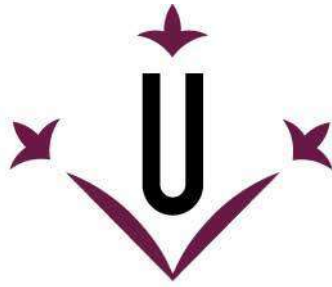
Ellis Kofi Akwaa-Sekyi

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Universitat de Lleida

DOCTORAL THESIS

**ESSAYS ON BANK INTERNAL GOVERNANCE AND CREDIT
RISK**

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(MSc. Microfinance; Mphil Banking & Finance; B.Ed Accounting; Teacher's Cert 'A')

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DEDICATION

This thesis is dedicated to my wife and children: Rosemond Opoku Agyemang, Ellis Akwaa-Sekyi Akomeah Jnr, Quobena Akwaa-Sekyi and Maame Takyiwaa Akwaa-Sekyi. It is also dedicated to the great AKWAA-SEKYI family (my siblings and parents) for the wonderful support they always give to me.

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I still remember the words my father told me as a little boy that ‘I will be ready to sell even my last cloth to enable you reach the pinnacle of your education’. Little did I know that ‘old boy’ (as I currently call my father) meant Ph.D. I have no doubt in my mind that God created me for academic work and He has been so good to me, bringing very wonderful people in my way to enable me reach these feet. From the record age at which I entered secondary school, if all things were equal, I would have completed my Ph.D. by almost two decades ago. In spite of all these, I had the opportunity to pursue and complete my doctoral studies by 2009/10 but for university policy decisions, this could not materialize. The search for opportunity for doctoral studies continued until 2014 when I received a mail from Prof. Dr. Antoni Vaquer one evening. The most exciting portion of the mail was where he said ‘this afternoon, I signed your admission letter’. In winter 2015, I came to the University of Lleida, Spain to begin my Ph.D. studies.

Dr. Jordi Moreno Gené, my supervisor showed signs of readiness and willingness to mentor me even before I left Ghana for Spain. He has served in all capacities as mentor, supervisor, tutor, financier, brother, friend, translator, guide etc. I cannot have words enough to express my sincere gratitude to him. I have learnt a lot from him and will continue to maintain and deepen my relationship with Jordi. Prof. Dr. José Luis Galizzo Larraz is a man of few words but full of action. I have really enjoyed the tutorship, mentorship and support in both academic and personal life. Within the Faculty of Law, Economics and Tourism, I have met nice people like Prof. Dr. Antoni Vaquer Alloy, Dr. Ramon Saldrigues, Laura, Yolanda, Anna. I am grateful for your contributions to my completion. I am highly indebted to Prof Annukka Jokipii (Vice Rector, University of Vaasa) for the opportunity, exposure, support and motivation I received from you and the department during my internship at the University of Vaasa. I am also grateful to Prof Federica Miglietta, Dra. Valeria Rancone, Prof. Valerio Poti, Grazia and Andrea all of University of Bari (Aldo Moro) for the support during the Global-Doc Project in Italy.

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ABSTRACT

The purpose of this thesis is to assess the relationship between internal governance and credit risk. In the first paper, the study sought to investigate which factors determine business loan default. Using primary data from business clients in all the branches of a universal bank in an emerging economy, the paper employed a binary logistic regression model. The results show that ownership characteristics, loan characteristics, borrower characteristics, lender characteristics are significant determinants of the probability of loan default. Macro-economic and bank-specific factors also significant determinants.

The second paper studied the effect of internal controls on credit risk among Spanish listed banks. The object of the study was to investigate the exposure of sampled banks to credit risk because of the effectiveness or otherwise of internal control practices. The paper uses the random effect model to confirm significant effect of internal controls on credit risk. The study found the existence of the agency problem, which is perceived to undermine internal control mechanisms thereby exposing Spanish listed banks to credit risk. The findings show significant effect of the elements of internal controls, bank-specific factors, and country characteristics on credit risks. We report that internal controls do not only address operational risks but also credit risks.

The third paper investigates the relationship between bank internal controls and credit risk in Europe. The paper expanded the theoretical and geographical scope of the second paper. The theoretical scope added the objectives of internal control framework, a proxy variable for the agency problem (which is a novelty) and the geographical scope covered European Union countries. The study used panel data from 2008-2014 on 91 banks within twenty-three (23) European Union countries. The estimation technique was a Generalized Least Squares (GLS) fixed effect model. The results show that effective internal control measures existed and significantly affect credit risk. The objectives of the internal control framework are achieved thereby suggesting effective internal control systems. However, contrary to prior studies, there is weak significant positive effect of the agency problem on credit risk. The significant internal control variables were risk assessment, control activities, performance and compliance objectives.

The fourth paper discusses how board characteristics and insider ownership affect non-performing loans in European banking. The study introduces a novelty classification of board characteristics into intrinsic and extrinsic characteristics. The paper uses among others, 2-stage least squares (2-SLS) instrumental variable and GMM to address endogeneity issues. The results show negative relation between gender diversity, board size and insider ownership on NPLs. There is however, a positive relation between average board age and board tenure on NPLs. The inclusion of insider ownership improves the significance of board characteristics therefore confirming a complementary instead of substitutable approaches in addressing bank risks. The paper confirms the agency theory justifying the use of managerial incentives to improve upon board monitoring functions.

RESUMEN

El propósito de esta tesis es evaluar la relación entre la gobernanza interna y el riesgo de crédito. En el primer trabajo, el estudio trató de identificar que factores determinan el incumplimiento del préstamo comercial. Para ello, se utilizaron datos primarios de clientes empresariales en todas las sucursales de un banco universal en una economía emergente. En el análisis se empleó un modelo de regresión logística binaria. Los resultados muestran que las características relativas a la propiedad, las características préstamo, las características del prestatario y las características del prestamista, son determinantes significativos de la probabilidad de incumplimiento del préstamo. Factores macroeconómicos y específicos del banco también se revelan como determinantes significativos.

A continuación, una segunda investigación estudia el efecto de los controles internos entre los bancos cotizados españoles. El objetivo de este estudio fue investigar la exposición de los bancos de la muestra al riesgo de crédito como resultado de la efectividad o ineffectividad de las prácticas de control interno. El estudio utiliza el modelo de efectos aleatorios para confirmar un efecto significativo de los controles internos sobre el riesgo de crédito. El estudio identificó que la existencia de problemas de agencia que se perciben socavan los mecanismos de control interno, lo que expone a los bancos españoles que cotizan en bolsa al riesgo crediticio. Los hallazgos muestran un efecto significativo de los elementos de control interno, los factores específicos del banco, y las características del país sobre los riesgos crediticios. Se aporta evidencia de que los controles internos no solo abordan los riesgos operativos, sino también los riesgos crediticios.

El tercer trabajo investiga la relación entre los controles internos de los bancos y el riesgo de crédito en Europa. En este sentido, la investigación amplía el alcance teórico y geográfico del trabajo anterior. En cuanto al alcance teórico, se agregan los objetivos del marco de control interno, así como una variable proxy para el problema de la agencia (lo que constituye una novedad), mientras que en relación al alcance geográfico, el nuevo análisis abarcó a los países de la Unión Europea. Concretamente, el estudio utilizó datos de panel de 2008-2014 en 91 bancos operativos en 23 países de la Unión Europea. La técnica de estimación fue un modelo de efectos fijos de mínimos cuadrados generalizados (GLS). Los resultados muestran que existían medidas efectivas de control interno y que afectan significativamente al riesgo crediticio. Los objetivos del marco de control interno se logran sugiriendo sistemas de control interno efectivos. Sin embargo, al contrario que en estudios anteriores, se observa un efecto positivo y débilmente significativo del problema de la agencia sobre el riesgo de crédito. Las variables de control interno identificadas como significativas fueron la evaluación de riesgos, las actividades de control, el desempeño y los objetivos de cumplimiento.

Por último, el cuarto trabajo discute cómo las características del consejo de administración y la presencia de la propiedad en el mismo afectan a los niveles de préstamos problemáticos en el sector bancario europeo. El estudio introduce una clasificación novedosa de las características tanto intrínsecas como extrínsecas del consejo de administración. El trabajo utiliza entre otros, una variable instrumental de mínimos cuadrados en dos fases (2-SLS) y el método de los momentos generalizado (GMM) para solventar cuestiones de endogeneidad. Los resultados muestran una relación negativa entre la diversidad de género, el tamaño del consejo y la presencia de la propiedad interna sobre los préstamos problemáticos. Sin embargo, existe una relación

positiva entre la edad media de la junta y la permanencia de la junta sobre los préstamos problemáticos. La inclusión de la propiedad en el consejo mejora la importancia de las características del mismo, por lo que se confirma que estos enfoques son complementarios en lugar de sustituibles para abordar los riesgos bancarios. El trabajo confirma la teoría de la agencia que justifica el uso de incentivos de gestión para mejorar las funciones de supervisión de la junta.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The financial services industry has suffered various forms of risks in recent times especially credit risk. Individual bank's credit risk has rippling effect on the entire financial system. As a way of innovative credit risk management, banks trade in various credit risk products such as Collateralized Loan Obligations (CLOs) and Credit Default Swaps (CDS). In a study, the authors report that, individual banks with these instruments are themselves not risky but they make significant contribution to the aggregate risk in the financial system (Nijskens & Wagner, 2011). This calls for serious attention from the regulator and stakeholders to ensure that firm-level risk control mechanisms are enforced through their internal governance systems. Within the banking industry, the conduct of some corporate employees has resulted in huge losses leading to the collapse of some institutions. These are evident in managerial opportunism, fraud and other misbehaviour. There appears to be loss of confidence in the banking system following events leading to the 2007 global financial crisis (Power, Simon, & Palermo, 2012) therefore calling for a cultural change in bank behaviour.

There are also weak corporate structures, systems and procedures in the conduct of business, which has also led to the loss of shareholder investments. Bank losses are directly or indirectly attributable to people, inadequate or failed internal processes, systems and external events (Basel Committee on Banking Supervision, 2010). These have generated so much interest and concern to stakeholders such as governments, international institutions, regulatory bodies, economic units and academia. In almost every continent or regional block, there is seemingly a fair share of such incidents leading to some crises of a sort. The situation is more devastating when it occurs within financial institutions. Europe has had its share of the financial crisis thus leading to the promulgation and enforcement of some rules. There have been changes in the regulatory landscape in the European banking sector to enforce new rules and prudential requirements. In averting the probability of further financial crisis and restoring confidence in the financial services industry, the European Central Bank has intensified efforts to ensure internal governance and control of banks and other financial institutions.

There is also the establishment of the Single Supervisory Mechanism (SSM), which focuses among other things on the role of internal controls and internal audit in credit institutions (EBA, 2015). The SSM is a Europe-wide banking supervision system to ensure market discipline and financial stability against the background that the area is an integration of various economies with its attendant systemic risks. Regulatory and legislative measures have been used to control the entrenched behaviours of shareholders which lead to loss of assets (Courteau, Di Pietra, Giudici, & Melis, 2017).

In recent times, there has been a paradigm shift from solely relying on regulatory approaches of managing risk to a holistic principle-based self-regulation to complement the use of regulations. The former is more prescriptive and a one-size-fits-all approach whilst the latter takes into consideration differences in bank-specific situations affecting risk conditions. Bank governance has been reported to have thrived well on sound internal control systems (International Federation of Accountants, 2006). Good bank governance with effective and reliable internal control systems deepens investor confidence and safeguarding of assets, which could prevent or minimize losses and risks the accumulation of which could lead to crisis. The European Parliament through one of its directives (Directive 2003/41/EC) mandated all institutions within its jurisdiction to maintain sound administrative and accounting procedures for adequate internal control mechanisms (Committee of European Insurance and Occupational Pensions and Supervisors, 2010). It is in response to these stances that this thesis seeks to study the relationship between internal governance and credit risk.

The thesis is a collection of four essays on aspects of internal governance and credit risk. Credit risk, usually measured by non-performing loans is a transformed set of defaulted loans. Series of loan defaults will make the portfolio non-performing before it gets to the stage of credit risk. Figure 1.1 shows the credit risk trajectory.

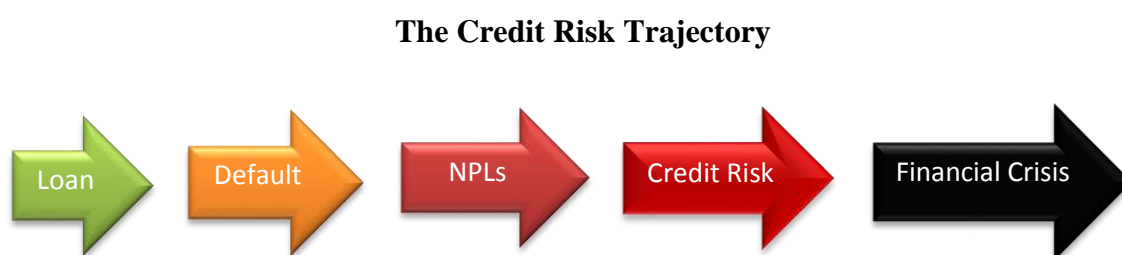


Figure 1.1: The Credit Risk Trajectory

Source: Author's construct

In this trajectory, unpaid loans transform into default, then prolonged default graduates into non-performing loans which leads to credit risk and eventually the effect on related market participants could lead to financial crisis. The final destination of this trajectory is financial crisis, which affects the wider industry players because of the interconnectedness of the banking model.

Internal governance covers the systems and mechanisms put in place to minimize losses within the limits of the bank. This branch of corporate governance uses internal control mechanisms, effective board systems and measures put in place to align the interests of the agent and the principal. Figure 1.2 illustrates the internal governance framework for dealing with credit risk.

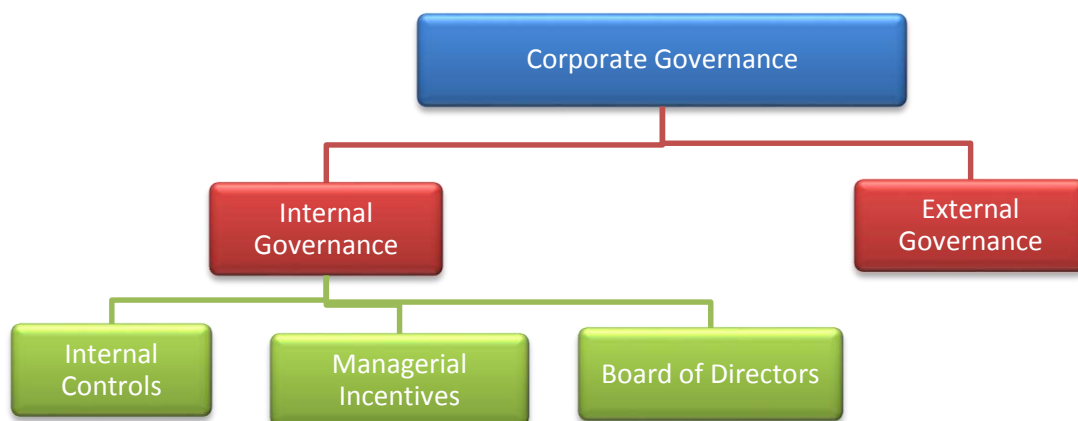


Figure 1.2: Internal Governance Framework

Internal governance stems from the broad corporate governance framework. This study uses three perspectives of internal governance namely; internal controls, managerial incentives and board of directors.

To make the study more holistic by way of scope (theoretical and geographical), the first paper focuses on the determinants of business loan default in an emerging economy (Ghana). The second paper delves into the effect of internal controls on listed banks in Spain. Among European countries that suffered greatly from the 2007 global financial crisis, Spain is believed to be one of such. The third paper takes the study higher in geographical by studying the relationship between internal controls and credit in Europe

using a quantitative approach. The fourth and final essay looks at other branches of internal governance, which is board characteristics. The paper investigates how board characteristics and insider ownership affect non-performing loans in European banking.

1.2 Motivation and problem statement

The motivations for this thesis hinges on three areas. One of these is the role of human factors in the rate of loss in the value of assets due to credit risk. The other motivations stem from the partial attribution of the 2007 global financial crisis to weak and failed internal processes and the significance of Europe as a hub for big banks. These situations create favourable conditions for research into the relationship between internal governance and credit risk.

Financial cost associated with employee fraud in the United States was estimated at around \$50billion annually (Coffin 2003 cited in Rae and Subramaniam, 2008). It was reported that in 2014, bank losses due to fraud cost \$64billion and out of this, 70% was internal and yet most remained undetected (Association of Certified Fraud Examiners, 2016). The situation is not getting better in a period where many economies are struggling to recover from the global financial crisis. Year-on-year cybercrime cases in the United States for 2014 increased by 141 percent (141%) with financial institutions reporting losses to the tune between \$10million to \$19million (Association of Certified Fraud Examiners, 2016). In the UK, financial fraud losses for 2016 accounted for £768.8million representing a 2% of the 2015 figure. Global report on bank operational loss indicate that for 98 banks signed onto the database, a total of more than 598000 events amounting to €390billion were lost between 2011 to 2016 (O.R.X. Annual Report, 2017). It is by advance detection through timely audit, compliance and risk consciousness, which are central to quality internal control systems that some of these unfortunate business practices could be averted.

Another closely related motivation stems from analysis of the 2007 global financial crisis. Arguably, review of the crisis pointed out that there were market and regulatory failures, poor supervision of banks, weak internal and external control systems and deficiencies in bank corporate governance functions (de Andres and Vallelado, 2008; Gualandri, 2011;

Gualandri et al., 2011; Kirkpatrick, 2009; Laeven, 2013). These created incentives for opportunism thus exacerbating moral hazards and agency problems within the financial services industry especially banks. It therefore becomes appetizing for a study into how internal controls have been efficiently been used to control bank risks following the aftermath of the crisis. In the opinion of Gualandri (2011), banks should embrace a new approach through effective enforcement and use of internal control mechanisms to manage and monitor risks. This laudable recommendation is given needed attention in this study. There have been several reforms in the banking industry after the global financial crisis to promote a more resilient industry in order to absorb the shocks of the distress (Laurens, 2012). However, Laurens concludes that, not the capital adequacy regulations and reforms of the Basel III will be enough to avert the failure of banks resulting from systemic crisis. The researcher is of the view that improving the quality of internal controls and strengthening control systems will help create a risk culture and consciousness which will revive the waning investor confidence.

There is also the contextual motivation about the use of Europe as a study area. Europe offers a strong environment in banking research. It has some similarities and differences with the US, Asia and Canada in terms of banking practices and internal control research. The European Union had its fair share of the devastations caused by the global financial crises after which the Union came out with concrete and pragmatic measures to correct and forestall such future occurrences. The state of non-performing loans in the EU have been worrying especially after the global financial crisis. Figure 1.3 illustrates a map of EU countries with figures for non-performing loans.

Europe as hub of some of the world's biggest banks: Risks of bank failure will have serious repercussions on the people's investments. The motivation stemming from the research context covers the EU as significantly crucial market and the home of big banks in the world. The motivations help identify the main gaps in research in order to refine the research problem.

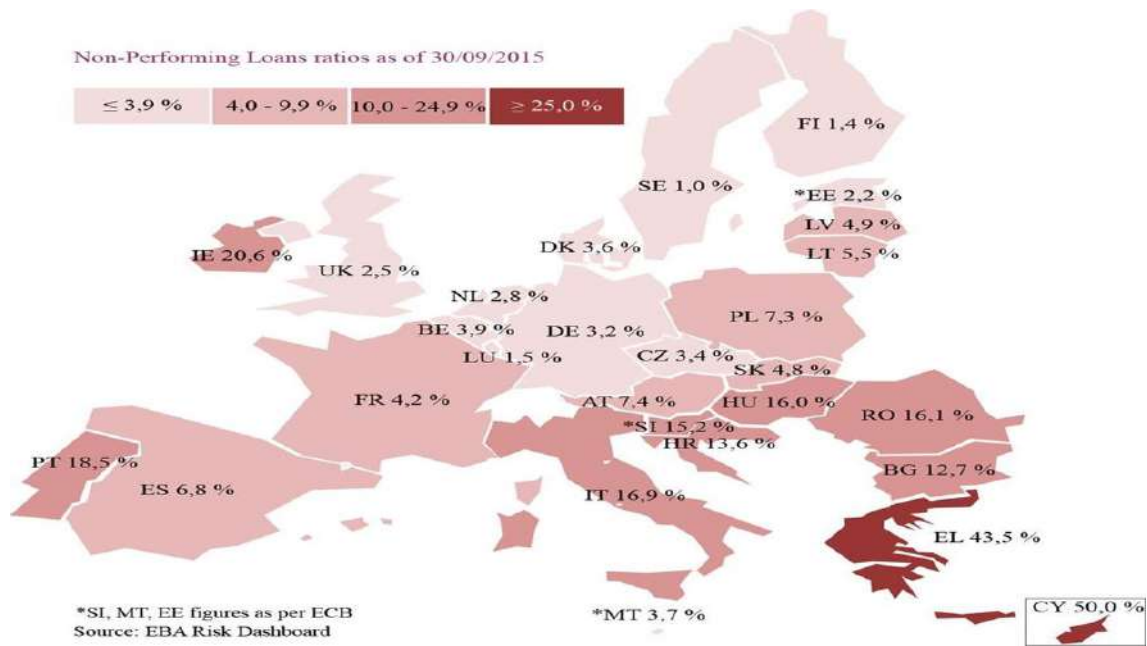


Figure 1.3: Non-Performing loans in the EU

Source: Copied from Mesnard et al. (2016)

Bank vulnerability to financial crises has been confirmed by authors such as Kashyap (2010) and Peltonen et al. (2015). Among the reasons to such vulnerability include bank financing function of most activities of economic units. It therefore becomes necessary for bank management to intensify strict control functions to minimize exposure to avoidable risks.

Studies on internal controls have followed a certain methodology and scope which the current study tries to deviate from. One of the areas of internal control research is financial reporting. In some circles, internal controls is narrowly and overly skewed towards financial reporting to the neglect of a broader risk management function which does not serve the supreme interest of stakeholders (International Federation of Accountants, 2006). There are debates about whether or not limiting managerial powers through internal controls improves financial reporting (Altamuro & Beatty, 2010). It is however not enough to appreciate the essence of internal controls only in the lenses of financial reporting. It is better to make internal controls more meaningful in the conduct of bank business before it is reported to relevant stakeholders. One important area of bank operations is the uncertainties surrounding business (risk) which this study seeks to focus attention. Lakis and Giriūnas (2012) reported that, internal control is an instrument used

to control risk within the enterprise to enable the achievement of goals and performance. The authors added that, internal controls purport to minimize or eliminate errors, mistakes and fraud from among individuals and organizations. Internal control systems must therefore control the conduct and ineptitudes of individual employees as well as the group behaviour of the organization.

Haq (2010) studied the determinants of bank risks in Europe and found bank characteristics and country-wide characteristics as strong determinants of various risks. Ross and Crossan (2012) found corporate governance structures as contributory factors to the banking crises in UK and Germany and proposed more comprehensive structures to address bank risks. Jin et al. (2013) found that banks reduce their risks through internal controls. This study seeks to add to the bank risk discourse by abstracting from these authors to build a comprehensive model that responds to current developments in bank research literature. The research is approached generically from an internal governance perspective so that bank-specific factors that trigger risks could be addressed through effective internal controls mechanisms. Not much has been seen as far as using quantitative data to study bank internal controls from a European perspective. This study uses the Basel Framework for internal controls to develop a conceptual framework for the study. This is done by quantitatively modelling the elements and objectives of internal controls to explore their relationship with bank risks. Other variables include bank specific variables, country-specific macroeconomic variables and stock market variables.

A very important area in research is the statement of a good research problem which leads to the formulation of central research questions; this is also sometimes referred to as the identification of the research gap (Dissanayake, 2013). A research gap is an area of research for which limited or missing information constrains the ability to make a meaningful conclusion for a research question (Robinson, Saldanha, & Mckoy, 2011). Such a gap creates a need which impairs decision makers' ability to make conclusive decisions. Gaps in research may be classified under context, knowledge or issue, theory, methodological and practical. The research gaps for this study can be found in the next section.

Context gap: Careful review of internal governance research reveals that there are gaps in cross-country studies thereby making it quite uncomfortable to generalize findings. In

the area of internal controls, studies have been made from the perspective of single countries such as Australia, Italy, Indonesia, UK, US, China etc (Cortesi, Tettamanzi, & Corno, 2009; Hunziker, 2017; Rae & Subramaniam, 2008; Rosenthal & Rotheram-Borus, 2005; Yurniwati & Rizaldi, 2015). Since the design of most recognized internal control frameworks are for international adoption, it is appropriate to test its applicability and use across different countries than single country contexts. Single country studies of internal controls have limitations in the generalization of findings, universal acceptance and adoption. It is against this background that this research proposes a cross-country study of internal controls within the European Union after an initial single country study in Spain. It is the hope of the researcher that this current work will fill the existing research context or research-setting gap identified with previous research. Overall, the thesis covers emerging economies, advanced economy and a cross-country study within Europe.

Knowledge or issue gap: There are various types of risks facing financial institutions and each type of risk has its own peculiar method of managing it. In these classifications of risk management, internal governance or control has been identified as effective in managing operational risks (Fernández-Laviada, 2007; Power, 2005; Scandizzo, 2005). Operational risk is defined as the risk of loss resulting from inadequate and failed internal processes, people and systems or from external events (Basel Committee on Banking Supervision, 2011). The design, implementation and evaluation of internal processes, systems and procedures is a periodic activity executed through the establishment of sound internal governance systems. What is not yet known in risk analysis is the relationship between internal controls and other risks such as credit risk. There is interconnectedness between operational and credit risks within the banking industry. The research conjectures that, internal controls can effectively deal with other types of risks apart from operational. The study explores the various aspects of credit risk such as default and non-performing loans in order to provide a broader and comprehensive picture of the concept. It is the expectation of this thesis to address this knowledge gap.

Theory gap: Theoretical explanations to internal governance research has taken single and narrower perspectives. As a complex management function, research in internal controls should be approached from a multi-dimensional perspective which merges or

compliment different but related theories (Filatotchev & Boyd, 2009). Some of the theoretical underpinnings of internal governance research are the agency theory (most popular), institutional theory, stewardship theory, stakeholders theory, resource dependency theory, contingency theory, social contract theory and organizational justice (Deumes & Knechel, 2008; C. Jensen & Meckling, 1976; Jokipii, 2010; Wiseman, Cuevas-Rodriguez, & Gomez-Mejia, 2012). It therefore makes it inconclusive as to the most widely accepted theory that explains corporate governance even though the agency theory seems to have dominated corporate governance research. This plethora of theories is explained by the many perspectives of looking at corporate governance such as ownership structure, monitoring, performance and compliance just to mention a few. A multi approach that blends closely related aspects of internal governance, which this study adopts, will address this theory gap in internal governance research. The agency, resource dependency and stakeholder theories provide explanations to this thesis.

Methodological gap: There are methodological gaps in internal governance research. Lots of studies used primary data through the administration of questionnaires to obtain information from respondents (Cerrone, 2014; Deumes & Knechel, 2008; Hermanson, Smith, & Stephens, 2012; Jokipii, 2010; Lansiluoto, Jokipii, & Eklund, 2016; Tunji, 2013). Such approaches suffer possible biases in the design of questions and from the respondents, test validity and reliability problems. In cases where quantitative data were used (Brown, Pott, & Wömpener, 2014; Chen, Dong, & Zhou, 2013; Cho & Chung, 2016), the concept was narrowly captured and did not cover all the core components of the framework. Thus, a panel data approach which collects data from different banks at different time intervals in order to ascertain a trend on the practice and test for effectiveness of internal control systems is what this study introduces. This quantitative approach enables the performance of various statistical tests and analyses.

Practical gap: Practical gap (the gap between research and practice) exist in the field of management science paradoxically because bridging the gap does not lie in the purview of researchers (Bansal, Bertels, Ewart, MacConnachie, & O'Brien, 2012). Effectiveness of internal governance systems have been in doubt in organizations thus making the difference between theory and practice very conspicuous. One common reason is the

heavy financial costs in successful implementation. The implicit or opportunity cost of not ensuring quality internal governance systems in banks far outweigh the financial costs. Complementing the theoretical with the empirical part provides enough practical implications in establishing the relationship between internal governance and bank risks. Again, the paper addresses practical gaps in the areas of corporate fraud, managerial abuse and opportunism and social irresponsibility (Letza, Sun, & Kirkbride, 2004).

The research gaps identified clearly defines the problem statement. Given the narrowly nature with which internal governance research has been conducted, the need for a broader holistic perspective of this complex system becomes inevitable. The narrow use of material weakness disclosure of internal controls provides a limited opinion of the multifaceted system of the framework. This study therefore proposes the use of a framework covering aspects of internal governance such as internal controls, board of directors' functions and managerial incentives. The researcher uses complementary theories in both single and cross-country studies. The first two articles were undertaken in single countries (Ghana and Spain) whilst the last two were conducted in Europe. The papers on internal controls went beyond the disclosure function which satisfies only the reporting objective (Hooghiemstra, Hermes, & Emanuels, 2015) to cover the compliance and efficiency functions of the Basel internal control framework. The use of a combined framework (Basel and COSO) in different countries using quantitative archival data to test the relationship between internal governance and bank risks is a novelty.

1.3 Research objectives

The objective of the research can be categorized into general and specific objectives.

1.3.1 General objective

The theoretical ground for this collection of essays is that, apart from the unexpected happenings of the banking business environment leading to asset losses, there are human and organizational system failures. The use of effective internal governance mechanisms can effectively minimize such bank asset losses. The general objective of this thesis is to explore the relationship between internal governance mechanisms and bank credit risk.

Banks have relied on prudential regulations and quantitative risk management practices to address credit risk issues. However, research has shown that corporate governance practices may affect bank risks positively or negatively. This is why this study seeks to assess how the internal governance aspect of corporate governance affects bank credit risk.

1.3.2 Specific objectives

In order to achieve the aim of the thesis, four broad objectives were set for the study and these are:

1. To investigate the determinants of loan default in emerging economies
2. To analyse the effect of internal controls on credit risk on listed banks in Spain.
3. To investigate the relationship between internal controls and credit among banks in Europe
4. To determine how board characteristics and insider ownership affect credit risk in European banking

1.4 Significance and scope of the study

Within the context of corporate governance research, this thesis provides practical answers to key issues that have led to impairment of investor confidence following events of the 2007 global financial crisis. This thesis provides a holistic approach to bank internal governance and risk. The in-depth review and syntheses provide theoretical support and justification for the key concepts whilst empirical evidence brings reality and pragmatism to the research. The significance of the study has implications for policy makers in the banking industry (international and central banks), board of directors, management, investors (including potential investors), shareholders, bank customers, the general public and the academia.

The study made new revelations and confirmed previous research on how internal governance affects not only operational risk as presented in most finance literature but also, credit risk. Thus, the findings from the research intend to give a broader perspective of the internal governance/credit risk relationship than it has previously been. The structure, quality and effectiveness of internal controls are evident in bank reporting. The

study reinforces prudence and cautiousness on the part of management even though the profit-maximizing objective cannot be shirked in the process of discharging a critical function such as asset generation. This study opens a grey area in the use of quantitative variables to study an area, which hitherto has seen the use of mostly primary data.

There are two areas covered under the scope of the study. These are the theoretical and geographical scopes. The theoretical scope of the study covers internal governance which includes internal controls, board characteristics and insider ownership (proxy for managerial incentives). Credit risk, viewed as a broad area has components like default and non-performing loans. These broad areas have been fully explored to unearth the underlying relationships between them. Variables derived are in accordance with the European Banking Authority's internal governance framework, the Basel Committee on Banking Supervision and COSO internal control frameworks. The similarities between these frameworks are elements and objectives of bank internal controls.

The geographical scope of the thesis covers emerging economies (Ghana), countries that have suffered from weak internal governance systems in the banking industry (Spain) and European Union (EU) countries. The Union (during the period of study) comprises twenty-eight (28) countries. As a group of countries, the EU has certain identifiable elements that define them as well as individual country-specific macroeconomic factors which uniquely identifies them and capable of influencing the conduct of bank business and the relationship on bank risks. Beside country-specific characteristics, bank-specific factors have also been covered in the study. The geographical scope of the cross-country studies covers all the countries in European Union.

1.5 Research questions and contributions of the study

In order to ensure in-depth coverage of the topic, the thesis sought to answer the research questions using empirical means. The first research question is what are the determinants of business loan default in emerging economies? This research question meant to find out the driving forces behind loan default, which later transforms into non-performing loans thereby leading to credit risk. The reason why this study was conducted in an emerging

economy like Ghana, was to give a holistic view of the topic thereby making the findings of the thesis more generalizable for emerging and advanced economies.

The second research question is what is the effect of internal controls on credit risk among Spanish listed banks? Spain is one of the four European countries most severely hit by the 2007 global financial crisis. There were some empirical evidences that cause of the financial crisis could partially be attributable to poor and failed internal processes. This was the motivation behind the second essay. The paper used the elements of the COSO internal control framework to address the second research question. The qualitative elements of internal controls were given quantitative measurements in a panel data study to determine their effects on credit risk.

In the third research question, the paper addressed the question; what is the relationship between bank internal controls and credit risk in Europe? In order to answer this question, the theoretical scope of the previous study was expanded to cover the elements and objectives internal control frameworks (COSO and Basel II) whilst the geographical scope covered Europe. Using a quantitative modelling of the variables, the work was an improvement of the previous paper and the findings were more generalizable than the previous paper.

The fourth research question attempted to look at the board of directors and managerial incentive aspect of internal governance. The research question was; how does board characteristics and insider ownership affect non-performing loans (NPLs) in European banking? Not only did this essay give another perspective of internal governance but also credit risk. Prolonged default makes such loans non-performing before leading to credit risk. The paper discussed the use of board monitoring and managerial incentive (through insider ownership) as tool for minimizing bank NPLs. The study thoroughly answered the research question, using a dynamic panel model to address endogeneity problems in board characteristics research.

This thesis has made significant contributions to research on bank internal governance and its relationship to risks. In all the papers, there was enough theoretical support for the agency theory. The theory confirms that, internal governance mechanisms minimize moral hazards among bank staff, which lead to the loss of value. Practically, apart from prudential regulations, central banks can use internal governance mechanisms to reduce

credit risk thereby creating value for stakeholders. Two main novelties from this collection of essays are: the use of quantitative variables to measure widely-used qualitative elements of internal control frameworks and the classification of bank boards into intrinsic and extrinsic characteristics.

1.6 Conceptual framework and Summary of essays

In this thesis, the framework for internal governance comprises internal controls, board characteristics and managerial incentives. This framework is consistent with Switzer, Tu and Wang (2018) who described internal governance by a range of variables including board composition, insider and institutional ownership. It is very important to ensure effective internal control mechanisms, align the mismatching interest of the agent and the principal through managerial incentives. These will end up reducing the agency problem, which is the main aim of internal governance. Figure 1.4 illustrates the conceptual framework. In order to understand the relationship between internal governance and credit risk, the study explores the determinants of the dependent variable (credit risk). Consistent with existing studies, we use loan default as proxy for credit risk. The study was undertaken in Ghana (an emerging economy).

INTERNAL GOVERNANCE

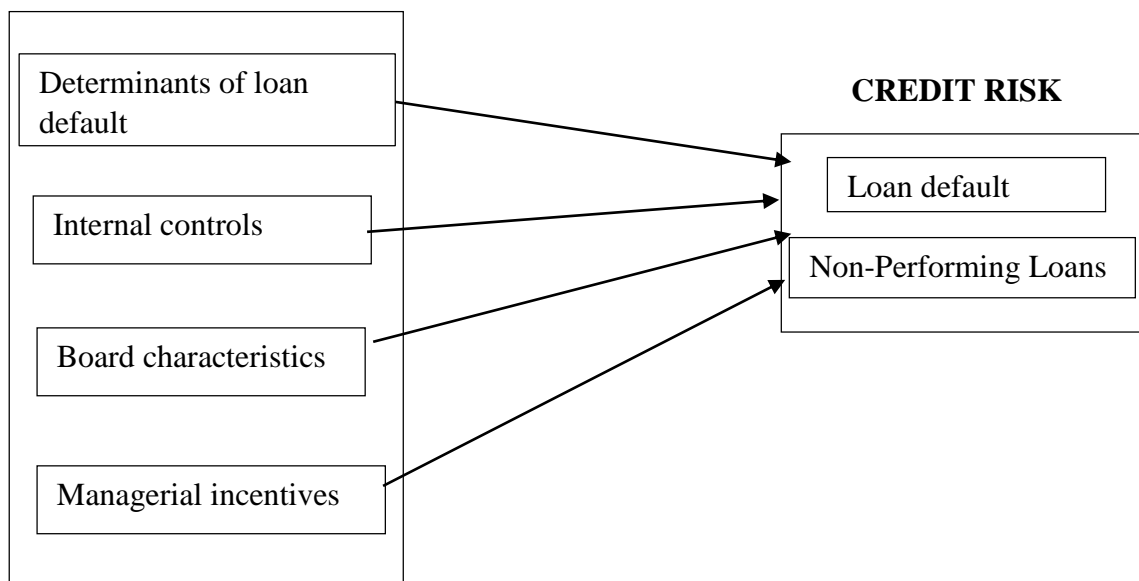


Figure 1.4: Conceptual framework

Source: Author's construct

In studying the relationship between internal governance and credit risk, the first paper explores the determinants of business loan default (credit risk). The paper uses primary data from clients of a universal bank in an emerging economy. All the branches of the bank were involved in the study, which employed a binary logistic regression. The study finds that ownership characteristics, loan characteristics, borrower characteristics, lender characteristics are significant determinants of the probability of loan default.

In the second paper, the central issue addressed is the effect of internal controls among Spanish listed banks. The study involved Spain because it was one of the four most affected countries by the 2007 global financial crisis. The object of the study was to investigate the effectiveness of internal control practices by examining the extent to which internal control objectives were achieved. Again, the paper investigated the whether Spanish listed banks were exposed to credit risk because of the effectiveness of internal control measures. The last objective sought to determine the effect of internal controls on credit risk. The study formulated hypotheses on internal control elements, bank-specific factors, country characteristics, and their effect on credit risks.

The third paper investigated the relationship between bank internal controls and credit risk in Europe. The paper expanded the theoretical and geographical scope of the second paper. The theoretical scope added the objectives of internal control framework and the geographical scope covered European Union countries. The study used panel data from 2008-2014 on 91 banks within twenty-three (23) European Union countries. The estimation technique was a Generalized Least Squares (GLS) fixed effect regression. The inclusion of the agency problem to the internal control framework is a novelty. The results show that effective internal control measures existed and significantly affected credit risk. The study confirmed the existence of the agency problem, which is contrary to literature because when there are effective internal control mechanisms, there should not be the agency problem. The significant internal control variables were risk assessment, control activities, performance and compliance objectives.

The fourth paper is on how board characteristics and insider ownership affect non-performing loans in European banking. The study introduces a novelty classification of board characteristics into intrinsic and extrinsic characteristics. Panel data from 2008-2014 among selected banks in Europe were involved in the study. The analysis includes

2-stage least squares instrumental variables and GMM models to address endogeneity problems. The results show negative relation between gender diversity, board size and insider ownership on NPLs. There is however, a positive relation between average board age and board tenure on NPLs. The inclusion of insider ownership improves the significance of board characteristics therefore confirming a complementary instead of substitutable approaches in addressing bank risks. The paper justify that managerial incentives improve the board monitoring functions and thus the agency relations in the analysed banks.

1.7 List of essays

1. Akwaa-Sekvi, E.K. & Bosompra, P. (2015). Determinants of Business Loan Default in Ghana. *Junior Scientific Researcher, Vol 1 (1)*, pp. 10-27
2. Akwaa-Sekyi, E. K. & Moreno, J. (2016). Effect of internal controls on credit risk among listed Spanish banks. *Intangible Capital, 12(1)*, 357-389.
3. Akwaa-Sekyi, E.K. & Moreno, J. (2017). Internal controls and credit risk relationships among banks in Europe. *Intangible Capital, 13(1)*, pp.25-50
4. Akwaa-Sekyi, E.K. & Moreno, J. How does board characteristics and insider ownership affect non-performing loans (NPLs) in European banking? *Unpublished*

1.8 Journals where essays have been published

The first article was published in Junior Scientific Researcher (JSR). The Junior Scientific Researcher is indexed in RePEc, MPRA, Directory of Open Access Journals, Scientific Indexing Service, Iseek, Open Academic Journals Index, Google School, Research Bible, Ulrichs WEB (Global Serials Directory, Polska Bibliografia Naukowa.

The second and third papers were published in Intangible Capital, a Scopus (SJR) Q3 journal which is indexed in Emerging Sciences Citation Index (ESCI Clarivate Analytics), H Google Scholar Metrics. It is also in databases such as Web of Science, Google Scholar, Arastirmax as well as repositories and directories such as Academic Journal Database, Crossref, DOAJ, EBSCO etc.

An extended preliminary version of the fourth paper was submitted as working paper to the publication *New trends in accounting and management*, which is edited by the Department of Business Administration of the University of Lleida, while the final version has been submitted to *Corporate Governance-An International Review* which is indexed in Q1 of Journal Citation Report (JCR).

CHAPTER TWO

RESEARCH METHODOLOGY

This section discusses the methodology used in the research. It covers the research philosophy, approach, strategy and methodology.

2.1 Research philosophy

Internal governance is a branch of corporate governance with emphasis on structured procedures for risk management and control within organizations. There is a paradigm shift in the enterprise risk management (ERM) framework towards an integrated approach where the agent and the principal are cooperatively involved in the design, analysis and mitigation of risks (Jacobus, 2015). It is out of these approaches that internal control mechanisms, role of board of directors and managerial incentives among others have emerged to strengthen the internal governance arm of bank risk management (European Central Bank, 2016). The philosophy of risk management requires that, players within the industry understand how risks may arise, the appetite and extent of tolerable risks, and how to deal with those risks so that its impact is not so catastrophic on the organization. Banks and other organizations execute internal governance mechanisms through internal controls, strategies to align the mismatching interests of the agent and principal, internal audit units, external audits and compliance with the directives of the regulator.

The banking industry is such a regulated industry that, studies on risk management and internal governance have not followed interpretive paradigms even though some authors have used qualitative methodologies. Such paradigms even though seem to have narrow coverage of concepts, researchers ended up providing detailed explanations leading to the in-depth understanding of phenomena. The new paradigm adopts self-assessment mechanisms and voluntary disclosure and reporting of material weaknesses in internal governance practices and systems. This thesis follows a positivistic epistemology disposition to test existing theories of corporate governance in order to make generalizations of the relationship to credit risk. Such objective approach provides justification for scientific research through replication and consistency of the research

methods. The research is a positivist philosophy because it follows structured, well-defined topics, hypotheses and research design.

2.2 Research approach

The research approach is mainly deductive. Following critical review of empirical works and theories, the study formulated four research questions to cover the broad areas of the four essays. In each of the essays, the study proposed and tested hypotheses on the relationship between internal governance variables and credit risk. There were theoretical underpinnings to each of the papers and the results provided confirmations to the theories and hypotheses stated.

2.3 Research strategy

The strategy for this research was the use of archival data from bank annual reports of banks and reputable databases. This strategy is a novelty in the internal governance research especially studies based on internal control frameworks. The use of quantitative (numerical) data mimics the qualitative variables they represent.

2.4 Research design

This thesis adopts a quantitative research method as can be seen from the analyses, tests and estimation techniques. The sampling technique was both probabilistic and non-probabilistic. All banks listed on the stock market during the period under review had equal chances of taking part in the study but where there was data unavailability for more than four years, such banks were dropped. Apart from the first essay on the determinants of business loan default, where the researcher used questionnaires to collect data on all branches of a universal bank in an emerging economy (Ghana), all the remaining three papers used panel data. Panel data combines cross-sectional and longitudinal (time series) data thus studying various banks over the period after the global financial crisis.

The research adopts a quantitative analyses methodology of the data using static and dynamic panel methods of analyses where various diagnostics, post-estimation techniques and robustness checks were performed. Figure 2.1 is a summary of the methodological flowchart.

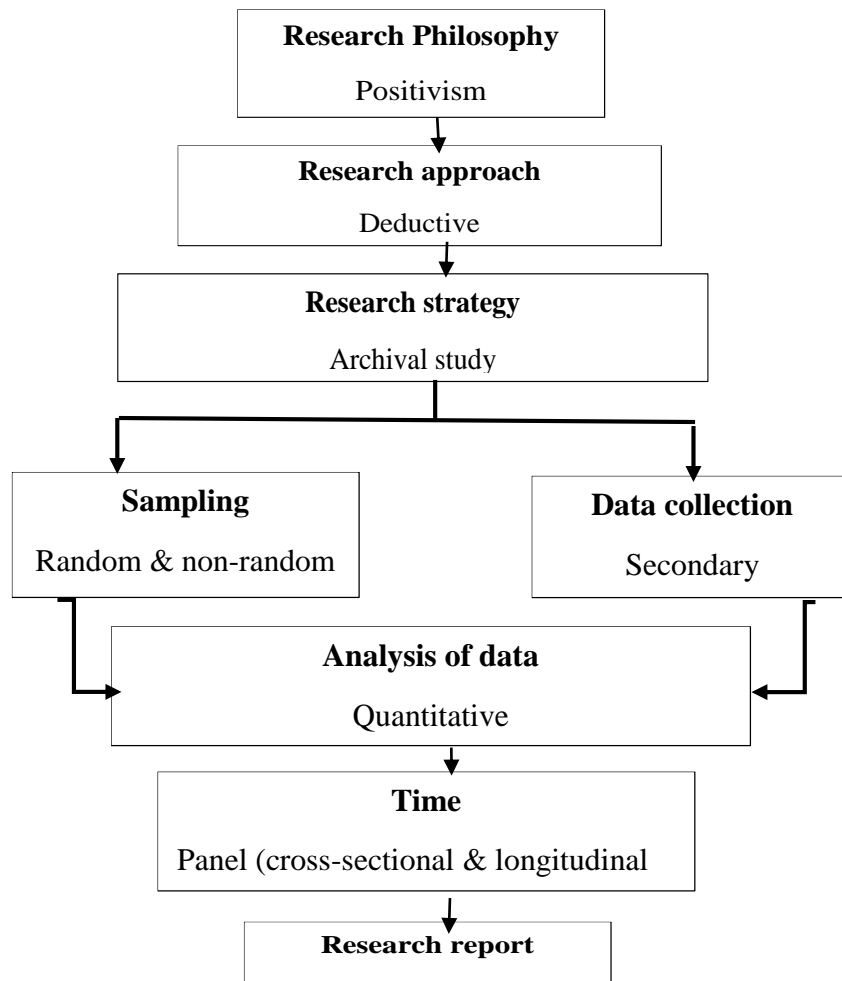


Figure 2.1: Research methodology flow chart

Source: Author's design

CHAPTER THREE

DETERMINANTS OF BUSINESS LOAN DEFAULT IN GHANA

3.1 Abstract

The initiation, funding, servicing and monitoring of loans by financial intermediaries has been done without regard to some critical factors, which could have averted the likelihood of default. The study aimed at measuring the extent that owner-specific, borrower-specific, loan and lender-specific characteristics could determine the probability of loan default. The study used logistic regression for 224 business customers of a bank in Ghana from its nation-wide branches. The study found that owner's extra income (ownership characteristics), multiple borrowing, diversion of loan purpose (borrower characteristics), loan price, loan purpose, loan age, repayment plan (loan characteristics) and underfunding (lender characteristics) significantly determined the probability of business loan default. The overall model predicted up to 78.5% of variations in the likelihood of default. The hierarchy of strong determinants given by their odd ratios were loan purpose (47.9 times), underfunding (19.2 times), diversion of loan purpose (11.7 times) multiple borrowing (9.4 times) and owner's extra income (8.2 times). The study can conclude that financial intermediaries should be wary of the credit granting process taking cognisance of ownership, borrower, loan and lender characteristics especially the significant predictors. Combining quantitative and qualitative variables as determinants of default could be considered in future.

Key words: *borrower-specific characteristics, default, financial intermediaries, lender characteristics, loan characteristics, ownership characteristics.*

JEL Classification: *G32, G21*

3.2 Introduction

Economic units will always engage in activities to satisfy their consumption of economic resources. Most of such activities are realized through the financial system. The financial system is the interaction of the activities of financial markets and institutions (Casu, Girardone & Molyneux, 2006). The financial system is made up of an interaction of market participants whose activities serve the needs of the other. Surplus units (lenders) and deficit units (borrowers) interplay through the exchange of contracts and transactions to satisfy and smoothen consumption after both parties have been duly rewarded either for the use of resources or for postponing consumption to a future date. The financial services sector especially banks have been lauded for their immense contribution to the

growth and development of the economy. They do so mainly by extending credit to economic units (individuals, households, firms and governments).

Apart from the traditional credit granting role of banks, they accept deposits, offer money transmission functions, offer business advisory services, help in implementing central bank monetary policies (Mishkin, 2006), acts as money-changers performing underwriting and brokerage functions (Madura, 2008). Banks have been seen to have superior informational economies which enable them to overcome the problem of information asymmetry which be-devils financial intermediation. In order to safeguard investments and ensure confidence in the financial system, central banks and international bodies recommend prudent measures in the conduct of business. The recent financial crisis has heightened the call for financial market discipline the greatest of which include loan default. The problem of loan default is prevalent in the US (Ghosh, 2015), Europe (Jiménez, Lopez, & Saurina, 2013) and other advanced economies (Fukuda, Kasuya, & Akashi, 2009) because the occurrence is a major contagion to the unsuspecting economic units who might have nothing to do directly with it.

A critical look at most bank balance sheets suggest that loans single-handedly support the greatest proportion of the bank's uses of funds (assets). At the macro level, loans and advances constitute 31.3% of total bank assets in Ghana (Bank of Ghana Annual Report, 2014). In emerging economies where banking activities don't seem to be very much deepened and diversified, banking activities and products mainly centre on loans and advances. This situation places heavy reliance on loans for bank revenues and expectations from shareholders. It is also seen that business clients have very large loan portfolios as compared to individual clients. Thus banks have greater incentives to make funding opportunities available to business clients and some banks have departmentalized a section that concentrates on dealing with business customers. These dynamics leave the banks with no option than to be extra cautious in the origination, funding, servicing and monitoring of business clients during the loan granting exercise.

In economies where the private sector is vibrant, there is the tendency for the creation of jobs and possible increase in GDP. This has been the success story behind most developed nations and governments in emerging economies are leaving no stone unturned to develop a vibrant private sector to support their economies. The successes of private businesses have thrived on meeting their financing needs of which the greatest proportion comes

from banks (Dixon, Ritchie, and Siwale, 2007). More often than not, bank loans go bad, the cause of which is attributable to a mix of bank-specific factors, borrower characteristics and other macro-economic factors (Louzis, Vouldis, & Metaxas, 2012). Such factors go a long way to increase the likelihood of loans default. When financial institutions take cognisance of these factors, cases of default which is attributable to such factors can be eliminated completely. Most research on default have focused on individual type of customers but it is about time business clients are also given the attention they deserve since they contribute so much to grow the economy.

The menace of loan default has attracted the intervention of international organizations and institutions through the Basel Committee on Banking Supervision (Basel I, II, III). The committee requires that, banks should have risk management committees, standardized procedures and acceptable ways of granting credit. The reliance of these risk-based approaches do not provide a panacea to loan default but some level of due diligence on the part of financial institutions and not being oblivious of research empirical factors that provide incentive for default. Borrower characteristics has been found to have significant effect in determining the probability of default (Knapp & Seaks, 1992). The study by Knapp and Seaks was about individual personal loans. Jimenez and Saurina (2003) found that collateralized loans have higher probability of default. The same was found for close bank-borrower relationship by the authors.

According to them, a close bank-borrower relationship increases the willingness to take more risks. The initiation, funding, servicing and monitoring of credit creates opportunistic tendencies of the parties involved (borrower and lender). There is usually an incentive for ex-post moral hazard issues that endangers the theory of financial intermediation (Andrieş, 2009). The studies by various authors who used non-performing loans as proxy for default in Europe concentrated on macro level factors very interesting results (Khieu, Mullineaux, & Yi, 2012); Makri et al., 2014; Messai and Jouni, 2013). The need for similar studies in emerging economies is very paramount. In cases where studies have done in developing economies, the concentration has been on individual or household clients (Awunyo-Vitor, 2012). The current study aligns with studying emerging economies but approaches it from business client's perspective. This is because the development of the private sector has incentive to boost economies through the

creation of jobs and improvement in living standards of the people (Ghana Banking Survey, 2013).

With about sixteen branches operating nation-wide, the bank used for the study has operated as a universal bank for over eight years. The bank varied diversified products for its individual, business and corporate clients in and outside Ghana. The bank has a core mission to expand business development through financial intermediation in the best way possible to impact lives in emerging economies through customer-centric and shareholder value maximization. The rest of the section is organized into background, methods, analysis and results and conclusions.

3.3 Background

This section of the write-up covers a description of the Ghana banking industry, theoretical framework for the study, factors that have the probability of causing loan default.

3.3.1 Banking industry in Ghana

The regulator of banking business in Ghana (Bank of Ghana) introduced the universal banking concept in September 2003 and banks have since diversified their portfolios and activities to make them financial super markets. The banking industry in Ghana consists of 27 universal banks dominated by foreign ownership. The breakdown of banks and their market shares for the past three years can be found in Table No.1.

Table 3.1 Bank ownership source and market share distribution

Banks	2012		2013		2014	
	Number	Market share(%)	Number	Market share(%)	Number	Market share(%)
Foreign:	14	55	14	58.2	14	53.9
Europe	3	20.1	3	18.1	3	15.7
Pan Africa	10	34.5	10	39.7	10	37.8
Others	1	0.4	1	0.4	1	0.4
Domestic:	12	45	12	41.8	13	46.1
State-owned	4	22.8	3	18.5	4	19
Private	8	22.2	9	23.3	9	27.2
Total	26	100	26	100	27	100

Source: Bank of Ghana Annual Report 2014

The ownership structure exposes the banking industry to shocks from parent countries and international financial system especially with regards to counterparty relationships. The industry has close relation with allied support systems like credit reference bureaus and collateral registry which help minimize potential loan defaults (Bank of Ghana Annual Report, 2014). Credit in the form of loans and advances has been progressive in the past years with the year 2014 recording a 40% increase from the previous year. Figures from the Bank of Ghana Annual Report (2014) indicate that total credit to the private sector increased from 28.6% in 2013 to 42.3% in 2014.

3.3.2 Theoretical framework

Loan default, credit risk, non-performing loans are expressions with same connotation described as among the biggest source of bank worries (Al-Tamimi & Al-Mazrooei, 2007); (M. Haq, 2010); (Mamiza Haq, Faff, Seth, & Mohanty, 2014). Default is the likelihood that a borrower misses payment or does not meet the conditions of an agreement or indenture (Sobehart, Keenan and Stein, 2001). Loan default has been reported in many economies including advanced (Fukuda et al., 2009); (Jiménez et al., 2013); (Saurina & Jimenez, 2006) and the consequences have been unpleasant. Excessive cases of loan default impair the reputation of the bank (Mamiza Haq et al., 2014). Research on loan default has been approached by different authors from several perspectives. Among the theories used include the financial accelerator theory used by Bernanke and Gertler (1995) and Kiyothaki and Moore (1997). Life-cycle consumption theories used by Lawrence (1995) as theoretical framework have been applicable to individual consumer type of loans. The theoretical support for the study is derived from the theory of financial intermediation and agency theory. According to Casu et al. (2006), the theory of financial intermediation answers the question of ‘why do banks exist?’

Twentieth century researchers on the theory of financial intermediation have chastised the theory’s basis for explaining the invaluable role of financial intermediaries in reducing the cost of transactions and information asymmetry (Andrieş, 2009; Claus and Grimes, 2003; Scholtens and van Wensveen, 2003). They argue that the advent of technology, deregulation and deepening financial markets reduce intermediation costs thus making financial intermediaries useless. Scholtens and van Wensveen contend that financial

intermediaries do not create value as being touted and thus the theory fails to provide satisfactory reasons for the existence of financial intermediaries. The problem of loan default has exacerbated (Mamiza Haq et al., 2014) and lenders have not been unquestionably efficient even with the advent of sophisticated technology, heavily deregulated financial environment and the existence of efficient financial markets. According to Casu et al. (2006), banks exist for five main reasons thus describing their core functions for which they are seen to have superior advantage as compared to direct finance where there are no intermediaries. These functions are: delegated monitoring, liquidity transformation, information production, consumption smoothing and commitment mechanisms.

The dynamics of market activities, participants and sophisticated demand for finance calls for some dynamism in the traditional view of the theory of financial intermediation (Andries, 2009). Indeed transaction costs and information asymmetry have been minimized through financial intermediaries (Claus & Grimes, 2003), but the issue of who monitors the intermediary creates an incentive to take a second look at the traditional theory (Claus & Grimes, 2003). When the financial intermediary exploits its informational economies, the tendency for the agency problem is eminent in favour of the lender (Andrieş, 2009). Such incentives could motivate reckless credit granting processes (M. Haq, 2010), which could lead to swelling non-performing loans which endangers confidence in the financial system (Jiménez et al., 2013). The current study aligns with the theory of financial intermediation, but takes cognisance of the agency theory and possible exploitation of information asymmetry (Bolton and Freixas, 2000). To this end, lender and loan-specific factors have been explored so that a more holistic approach is given to address the issue of default which is a menace and believed to be the cause of major global financial crises (Cornett, McNutt, Strahan, & Tehranian, 2011); (Ivashina & Scharfstein, 2010).

3.3.3 Factors leading to loan default

The issue of loan default should not be mistaken for a deliberate act. There might be genuine reasons beyond the control of the borrower which might lead to default. Brehanu and Fufa (2008) classified them as voluntary and involuntary causes of loan default. However, the interest of this study is to delve into those factors which are avoidable and

traceable to the borrower or lender. Lending institutions will normally have to assess their capability to grant credit to their clients (Bastos, 2010). This is done by giving due consideration to the credit-worthiness of clients, availability of funds for onward transmission, adequacy of borrower collateral and existing regulations regarding the granting of loans by internal and external regulators (Barry, Mann, Mihov and Rodriguez, 2008). The probability of loan default is caused by many factors which could be clustered together as borrower characteristics, lender characteristics and loan characteristics (Abid, Ouertani, & Zouari-Ghorbel, 2014); Glennon and Nigro, 2005; (Ghosh, 2015). We include another type of classification based on ownership characteristics, since this study is about business clients.

Ownership characteristics: Coravos (2010) reported that the kind of business ownership or ownership structure could bring about default. Usually, sole proprietors are more susceptible to higher default as compared to ownership types with more members. The kind of collateral an owner has, has the probability of causing default (Jimenez and Saurina, 2003). The writers reported positive relation between the owner's collateral and the likelihood of loan default. In cases where the owner has other source of income or any extra income, the possibility of default might be positive (Brehanu and Fufa, 2008). When the borrower has extra income apart from the business source, the tendency for reckless financial management is possible and default might occur. We therefore hypothesize from the above deliberations that:

H₁: Ownership characteristics can determine possible loan default

Borrower characteristics: The location or distance between borrower and lending institution was used as determinant of demand for collateral (Jiménez, Salas and Saurina, 2009), but we try to test it for probability of default. Usually, when the borrower is located very close to the lender, monitoring is easier and might reduce the likelihood of default. The age of the borrower was also determined by Mokhtar, Nartea, and Gan (2012) as possible cause of default. When the business has been in existence for long, they have enough experience to ensure sound financial management practices which could avert possible default. At times, over reliance on experience leads to financial indiscipline which could result in default. In the work of Mokhtar et al. they found strong positive

correlation between multiple borrowing (which they referred to as extra loan) and the probability of default. The same result was found by Jimenez and Saurina (2003). Multiple borrowing increases the stress on the resources of the business which can result in default. The size of the business can determine default. Usually, small businesses default more frequently than large ones (Brehanu and Fufa, 2008). It was reported by Jimenez and Saurina (2003) that the kind of relationship a borrower has with the lender has the tendency to trigger default. They found a positive relation between borrower-lender relationship and probability of default. Borrowers with good relation have disincentive to default especially when the default is borrower-caused. This leads to our second hypothesis that:

H₂: Borrower characteristics can predict the probability of business loan default.

Loan characteristics: There are several loan-specific factors that can lead to possible default (Foster & Zurada, 2013); (Khieu et al., 2012). The length of time to maturity of the loan described by some authors as loan age, or loan term has the probability of causing loan default. Loans that have longer period to maturity have higher probability of default (Roslan and Abd Karim, 2009). Even though their study was with individual clients within the microfinance industry, their finding is applicable to this current study. Mokhtar, Nartea and Gan (2012) found that the loan schedule could bring about default. Depending upon the frequency with which money flows into the business, servicing of loans should match the timing of the flow of money. It is most advisable for business loans to be serviced in periods less than one month intervals. The purpose of the loan could result in default. When the purpose is mostly different from expanding the business or adding up to direct production or provision of services, default looks very unavoidable (Herrington and Wood, 2003). The price of loan (interest rate) determines the probability of loan default (Salas & Saurina, 2002). The writers found from the Spanish banking industry that interest margin determined delinquency. We therefore hypothesize that:

H₃: Loan characteristics determine the probability of business loan default

Lender characteristics: Certain factors that are traceable to the lending institution can bring about default (Abid et al., 2014); (Louzis et al., 2012). Faulkender and Petersen (2006) reported that the timing of loan approvals play critical role in the repayment

capabilities of borrowers. When loan processing takes unnecessarily long time, borrowers might miss opportunities which might be time-bound and may lead to a diversion of the loan purpose. Herrington and Wood (2003) reported that shortages in the amount applied for by the borrower could bring about default. When financial institutions approve an amount lesser than what the applicant sought for, the purpose for which the loan was intended becomes difficult to accomplish and borrowers might divert the usage of the loan which can result in failure and possible default. The probability of loan default increases when borrowers divert the purpose for which the loan was sought (Claessens, Krahnen, and Lang, 2005). It is therefore the duty of the bank to ensure that there is evidence of the loan purpose before it is approved. The interest charged which is the known as the price of the loan can increase default probability. Exorbitant interest rates put heavy demands on the borrowing thus making servicing of the loan very difficult. Coravos (2010) reported that high interest rates increase the probability of loan default. In this study, interest is mentioned as loan price. The deliberations above leads to the hypothesis that:

H₄: Lender characteristics lead to business loan default.

3.4 Methods

Various authors have used different approaches to address the issue of default by approaching the study from either qualitative or quantitative approaches, studying individual clients or business clients, use of secondary or primary data. This study uses primary source of data studying business clients in a quantitative research design. The researchers used a survey design which allowed for careful design and scrutiny of the research instrument as has been emphasized by Robson (2011). Although the study has the attribute of a case study design where one universal bank was studied, the nation-wide coverage of the branches allows for variability and possible generalization of the findings. The myriad of research designs employed in this study is to enable the objectives of the study be realized. Among the objectives of the study include determining ownership-specific factors, borrower factors, loan and lender factors that have the tendency to trigger business loan default. These objectives were addressed through the test of four hypotheses which are stated below:

H₁: Ownership characteristics lead to business loan default

H₂: Borrower characteristics lead to business loan default

H₃: Loan-specific factors lead to business loan default

H₄: Lender characteristics lead to business loan default.

The sample covers eleven branches spread across four regions of Ghana. The sampling techniques were both probabilistic and non-probabilistic strategies. The non-random sampling technique was the quota sampling technique where branches with higher number of business clients were given larger participation to reduce possible biases. After determining the number of business clients in a particular branch, random sampling technique was employed to give each business client equal chance of being selected for the study. Systematic random sampling technique was used where a random number was chosen (between 1-10) depending upon the quota given to each branch and the '*n*th' random number chosen was selected from the loan files till the quota was exhausted. Out of three hundred (300) questionnaires distributed to various business clients of the bank, two hundred and fifty (250) were returned but two hundred and twenty-four (224) were fully answered. The fully answered questionnaires were used for the analysis thus representing a response rate of about 75%.

We use a binary logistic regression to determine the factors that signal the probability of business loans default. The data was coded into SPSS version 20 and the results analyzed. Most of the predictor variables that had more than two response alternatives in the questionnaire were re-coded in their categorical binary forms to satisfy the conditions for a binary logistic regression. The summarized list of variables, their expected signs or directions of influence and their associated authors has been presented in Table 3.2.

Table 3.2 Variables and expected signs

Variable	Expected sign	Author
Owner-specific characteristics		
Ownership type (Business structure)	+/-	Coravos (2010)
Owner's collateral	+	Jimenez and Saurina (2003)
Extra source of income	+	Brehanu and Fufa (2008)
Borrower-characteristics		
Business age	+	Coravos (2010)
Business size	+/-	Brehanu and Fufa (2008)
Relationship with lender	+	Jimenez and Saurina (2003)
Multiple borrowing	+	Jimenez and Saurina (2003)
Business location	+/-	Jiménez, Salas and Saurina, (2009).
Diversion of loan purpose	+	Claessend, Krahnem, and Lang, 2005
Loan characteristics		
Purpose of loan	+/-	Herrington and Wood (2003)
Age of loan (term)	+	Roslan and Abd Karim (2009)
Repayment plan/schedule	+/-	Mokhtar, Nartea and Gan (2012)
Loan price	+	Coravos (2010)
Lender characteristics		
Underfunding	+	Herrington and Wood (2003)
Delays in loan processing	+	Faulkender and Petersen (2006)

Source: Compiled by authors based on research in November 2015

3.5 Model specification

The logistic probability function is expressed as

$$(1) \quad P(Y = 1) = \frac{1}{1 + e^{-z_i}}$$

Taking the natural logarithm

$$(2) \quad Z_i = \ln\left(\frac{\hat{P}}{1 - \hat{P}}\right) = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n$$

Using a generalized logistic regression model to include the error term, the logit model for our study is expressed as

$$(3) \quad \ln\left(\frac{\hat{P}}{1 - \hat{P}}\right) = \alpha_0 + \beta_1 X_1 + \Phi_2 X_2 + \psi_3 X_3 + \lambda_4 X_4 + \varepsilon$$

where ln = the logarithm of the likelihood of the event

\hat{P} = a binomial proportion

X = explanatory variables

$\alpha, \beta, \phi, \psi, \lambda$ = parameters of the logistic model for constant, ownership characteristics, borrower characteristics, loan characteristics and lender characteristics respectively.

We introduce our variables into the general model for a logistic regression as:

$$(4) P(\text{default}) = \alpha_0 + \beta_1 \text{OwnXtics} + \phi_1 \text{BorrwXtics} + \psi_1 \text{LoanXtics} + \lambda_1 \text{LendXtics} + \varepsilon$$

Where; default = 1 if a borrower misses a payment contrary to the loan agreement

OwnXtics = Ownership characteristics listed in Table No.1

BorrwXtics = Borrower characteristics

LoanXtics = Loan characteristics

lendXtics = Lender characteristics (found in Table No.1)

ε = Error term

Expanding the equation to include all the variables to be estimated;

$$(5) P(\text{default}) = \alpha_0 + \beta_1 \text{OwnTyp} + \beta_2 \text{OwnCollat} + \beta_3 \text{OwnExtInc} + \phi_1 \text{BusAge} + \phi_2 \text{BusSize} + \phi_3 \text{RelaWitLend} + \phi_4 \text{MultBorrow} + \phi_5 \text{BusLoc} + \phi_6 \text{DiverofPurp} + \psi_1 \text{LoanPurp} + \psi_2 \text{LoanAge} + \psi_3 \text{RepayPlan} + \psi_4 \text{LoanPrice} + \lambda_1 \text{Underfund} + \lambda_2 \text{DelaysinProc} + \varepsilon$$

The explanations to the variables can be found in Table No.1

3.6 Goodness of fit tests

The Omnibus and Hosmer-Lemeshow tests were run to test the ‘goodness of fit’ of the model. The H-L test provides a Chi-Square test of whether or not the model is ‘adequate fit’ to the data. The null hypothesis is that the model is a ‘good enough’ fit for the data and it is always appropriate that a significance value that rejects this null hypothesis be obtained for a good fit. The test of the predictive power of the set of individual coefficients of the model also known as the ‘goodness of fit test’ is shown by the Omnibus test. A highly significant value is most preferred. It can be seen that the model is highly significant at 95% confidence interval given significance value of 0.000 (meaning $p < 0.0005$). The Chi-square value is 186.1 with 15 degrees of freedom. This means the model is able to distinguish between respondents who defaulted from those who did not experience default of any kind. A further ‘goodness of fit’ test is the Hosmer and

Lemeshow test which prescribes that a significance value less than 0.05 is an indication of poor fit. The Chi-square value for the Hosmer-Lemeshow test is 12.192 with 8 degrees of freedom and a significance value of 0.143. The significance value is far above 0.05 therefore indicating support for our model.

Table 3.3 Goodness of fit tests

Goodness of fit Tests of Model Coefficients			
Omnibus test	Chi-square	df	Sig.
Step	186.102	15	.000
Block	186.102	15	.000
Model	186.102	15	.000
Hosmer-Lemeshow test	12.192	8	.143

Source: Field survey, 2013

The model is able to accurately predict the correct category which in this case is the probability that a borrower defaults in loan repayment. The result indicates that the model is able to predict by 94.7% accurately that a borrower might default in one way or the other in the repayment. This prediction accuracy shows the sensitivity of the model. The non-defaulters are predicted by 83.8% (Appendix 3.2) accuracy and this indicates the specificity of the model. The overall accuracy prediction is 91.1% which is very good for a study of this kind. There were weak correlation coefficients (less than or equal to 0.5) in a correlation matrix which indicates the absence of multicollinearity. None of the predictors had correlation coefficients more than 0.5.

3.7 Results and discussions

There were 224 business customers studied out of which 67% indicated default of a kind. The binary coding of the variables for the purpose of the logistic regression can be found in Appendix 3.1. The model summary provides more reliable information usefulness of the general model. The Cox & Snell R Square and the Nagelkerke R Square (Appendix 3.2) reports on the amount of variation of the outcome variable (default) explained by the model ($0 < p < 1$). These values do not represent the true R square but the pseudo R square statistics since logistic regression does not measure linearity per se. The result indicates that, between 56.4% to 78.5% of variations in the probability of a business client defaulting in loan repayment is explained by the set of ownership, borrower-specific, loan-specific and lender specific variables. Out of the fifteen predictor variables included

in the model, nine of them were significant predictors at 95% confidence interval. The significant variables fell under each of the categories of predictors.

Owner's extra income (beta coefficient=2.102; sig=0.006) was the only ownership characteristic that showed significant positive relation with the probability of default. The odds ratio shown under B(EXP) column reports that owner's extra income could determine the probability of default by more than 8 times. The result is not different from that of Brehanu and Fufa (2008) who reported a non-directional relation between the two variables.

There were three borrower characteristics that show significant positive relationships with the probability of default. The size of the business (Wald test=6.833; B=2.023) which were coded as small or large had significance value of 0.009 and odds ratio 7.558 meaning it could predict default as many as over 7 times. Brehanu and Fufa (2008) reported that usually small businesses are potential defaulters than large size businesses. The same is confirmed in this study because about 52% of the businesses involved were small scale types and it is not surprising they show significantly positive relation with default probability. The study again reports that multiple borrowing (Wald test=9.517; S.E=0.726; B=2.241; sig=0.002) show significant positive relation with default probability predicting default probability by about 9times. When customers have loans with other institutions, there is too much pressure and demand on the resources of the business and defaulting becomes an option for such a borrower. Jimenez and Saurina (2003) found same result in their study. Diversion of loan purpose (Wald test=5.568; B=2.461; sig=0.018) showed positive significant relation with default probability and could predict the outcome variable by about 12times. The result is consistent with Claessend, Krahn and Lang (2005). When loans meant for business expansion are used for other purposes, it is more likely that the motivation to repay promptly will be jeopardized.

All the four loan characteristics variables showed strong significance with default probability. The purpose of loan (Wald test=19.188; sig=0.000; B=3.870) which were coded as for expansion (67.4%) and other purposes (32.6%) significantly determined the probability of loan default with as many 48times prediction determined from the odds ratio (47.944). Herrington and Wood (2003) reported that loan purpose can significantly determine the probability of default. We confirm a significant positive relationship from

our study. Interestingly, all the other loan characteristic variables reported significant negative relation with probability of default but very low and weak odds ratios less than 1. The result on cost of fund or loan price ($B = -2.297$; $\text{sig} = 0.005$) is inconsistent with the works (Salas & Saurina, 2002) and Coravos (2010) who rather found a positive relation with default probability. The odds ratio is very low and weak (0.101). The result on correlation coefficient is not surprising, because about 69% of the respondents indicated lower cost of loan, which is contrary to a perceived high interest rate. The respondents indicated that loan age ($B = -2.001$; $\text{sig} = 0.015$) was of short term (72%) nature meaning it was one year or less. Usually, long term loans are prone to default more than short term ones and since there were more short-term loan respondents, reporting negative marginal effect is not surprising. Again, we find a contrary report by Roslan and Abd Karim (2009) who rather found a positive relation. The repayment plan for business loans should be quite short and regular. We find significant negative relation between loan repayment plan ($B = -5.090$; $\text{sig} = 0.001$) and the probability of loan default. Mokhtar, Nartea and Gan (2012) predicted a non-directional relation, but we report a negative relation. Most respondents were paying their loans monthly, a situation which is uncommon with most small scale short term business loans.

The only significant lender characteristic was underfunding ($B = 2.953$; $\text{sig} = 0.000$; Wald test = 17.183). Usually, during loan assessment, the lender can recommend the approval of loan amount in shortage of the applied sum. This was found to have significant positive marginal effect thereby increasing the probability of default in a direct manner. The odds ratio reports 19 times ability to predict default probability. We find consistency with the work of Herrington and Wood (2003).

3.8 Conclusions

The study used a logistic regression to predict the determinants of business loan default. Fifteen variables categorized under ownership, borrower, loan and lender characteristics were involved out of which nine determinants were found to be significant. The nine variables fell under all the four broad classifications thus sustaining the alternate hypotheses that ownership, borrower, loan and lender characteristics predicted the probability of loan default. Most bank business customers operate the sole proprietorship ownership structure and the businesses are of small scale nature located not very near to

the banks. This calls for effective and constant monitoring in order to minimize loan default thereby making sense of the theory of financial intermediation. Such customers apply for short term loans for the purpose of expanding their businesses. This calls for the design of loan products tailored to meet such needs of business clients. Ownership characteristics, borrower characteristics, loan characteristics and lender characteristics have significant marginal effects on determining the probability of business clients defaulting in the loans applied for. The individual determinants are owner's extra income (ownership characteristics), size of business, multiple borrowing, diversion of purpose (borrower characteristics), purpose of loan, age of loan, repayment plan, loan price (loan characteristics) and underfunding (lender characteristics). The significant determinants of the probability of business loan default when arranged in hierarchy of their predictive strength is as follows: loan purpose, underfunding, diversion of loan purpose, multiple borrowing, owner's extra income, size of business, loan age, loan price and loan repayment plan.

The limitations we can report is the fact that the data was collected two years ago (2013) which could make some of the responses not as current as it would have been in 2015. Again, there was no robust test of multicollinearity but the use correlation coefficients in a correlation matrix. However, this does not cast any doubt about the originality and reliability of the results. The study has implications for financial intermediaries to be very mindful of ownership, borrower, loan and lender characteristics that determine loan default. It is not enough for credit institutions to use credit rating quantitative models alone in financial intermediation. A holistic approach to minimize the loan default is a myriad of approaches including the determinants identified (especially significant ones) and even macro-economic factors which could be captured as error term. Bank customers will find this research useful, because being aware of factors that relate to borrowers and observing them profile them as good clients whose loan applications cannot be turned down. This will help make the private sector, seen to be the engine of growth of emerging economies, function fully to contribute to the growth of GDP.

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APPENDICES

Appendix 3.1 Categorical Variables Coding			
		Frequency	Parameter coding
			(1)
Ownership Structure	Other forms of ownership	71	.000
	Sole Proprietor	153	1.000
Size of business	Large	108	.000
	Small	116	1.000
Location of business from bank	Near	71	.000
	Far	153	1.000
Relationship with bank	Long	122	.000
	Short	102	1.000
Diversion of loan purpose	No	173	.000
	Yes	51	1.000
Cost of funds	Low	154	.000
	High	70	1.000
Loan Age	Short term	161	.000
	Long term	63	1.000
Loan repayment plan	Short	30	.000
	Long	194	1.000
Multiple borrowing	No	135	.000
	Yes	89	1.000
Delays in loan processing	No	69	.000
	Yes	155	1.000
Extra Source of Income apart from business	Yes	67	.000
	No	157	1.000
Underfunding	No	98	.000
	Yes	126	1.000
Collateral Provided	Yes	186	.000
	No	38	1.000
Purpose of loan	Expansion	151	.000
	Other purposes	73	1.000
Duration in Business	Not New in Business	135	.000
	New in Business	89	1.000

Source: Field survey, 2013

Appendix 3.2 Variables in the Equation								
	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Ownership characteristics								
Business ownership	-1.168	.829	1.982	1	.159	.311	.061	1.581
Owner's collateral	-.085	.838	.010	1	.919	.918	.178	4.746
Owner's extra income *	2.105	.771	7.451	1	.006	8.204	1.810	37.180
Borrower characteristics								
Age of Business	.604	.650	.864	1	.353	1.829	.512	6.536
Size of Business *	2.023	.774	6.833	1	.009	7.558	1.659	34.439
Business Location	.240	.627	.147	1	.702	1.272	.372	4.349
Bank relationship	.113	.660	.029	1	.864	1.120	.307	4.083
Multiple borrowing *	2.241	.726	9.517	1	.002	9.404	2.264	39.053
Diversion of Purpose *	2.461	1.043	5.568	1	.018	11.715	1.517	90.446
Loan characteristics								
Purpose *	3.870	.883	19.188	1	.000	47.944	8.486	270.867
Loan Price *	-2.297	.821	7.829	1	.005	.101	.020	.503
Loan Age *	-2.001	.819	5.963	1	.015	.135	.027	.674
Repayment Plan *	-5.090	1.251	16.567	1	.000	.006	.001	.071
Lender characteristics								
Underfunding *	2.953	.712	17.183	1	.000	19.170	4.744	77.458
Delays in Processing	-.016	.823	.000	1	.985	.984	.196	4.940
Constant	.782	1.491	.275	1	.600	2.185		
<i>-2 Log likelihood</i>	<i>98.123</i>							
<i>Cox & Snell R Square</i>	<i>0.564</i>							
<i>Nagelkerke R Square</i>	<i>0.785</i>							
<i>Overall % prediction</i>	<i>91.1%</i>							
<i>Total observations</i>	<i>224</i>							
*significant variables in the model								

CHAPTER FOUR

EFFECT OF INTERNAL CONTROLS ON CREDIT RISK AMONG LISTED SPANISH BANKS

4.1 Abstract

Purpose: The paper examines the effectiveness of internal control systems, explores the exposure of Spanish banks to the dangers of default as a result of internal control systems and establishes a relationship between internal controls and credit risk.

Design/Methodology/Approach: Quantitative research approach is used to test hypotheses on the relationship between internal controls and credit risk among listed banks in Spain. Data from Bankscope and company websites from 2004-2013 were used. Generalized Least Squares (random effect) econometric estimation technique was used for the model.

Findings: We find that internal control systems are in place but their effectiveness cannot be guaranteed. This exposes Spanish listed banks to serious default situations. There is significant effect of internal controls on credit risk especially the control environment, risk management, control activities and monitoring. The non-disclosure of material internal control weakness is a contributory factor to the ineffective internal control systems. There is however a perceived board ineffectiveness which does not augur well for effective internal control systems. Board characteristics for Spanish banks confirm the agency theory.

Research Limitations and Implications: Data unavailability for certain years, variables and many inactive banks did not permit a larger sample size than expected. The use of quantitative variables lacks flexibility.

Practical Implications: Bank management will find the work useful to ensure strict enforcement of internal control mechanisms and see it as both credit risk and operational risk issues. Central bank should hurry to compel banks to disclose material internal control weakness as provided in the reviewed COSO framework.

Social Implications: Ineffective internal controls lead to credit risks, bank closure and loss of investments. Society suffers a lot from such losses and contagion. Disclosure of material internal control weakness is a social responsibility of banks.

Originality/Value: The authors are yet to come across the use of purely quantitative variables to model the effect of elements of internal controls on credit risk. This study opens and adds a new dimension of internal controls not only to be seen as operational risk issue but also credit risk.

Key words: Agency problem, Banking, Credit risk, Internal controls

4.2 Introduction

In the wake several corporate scandals, market failures and loss of investments, there is clarion call to ensure market discipline especially on the part of industry players. As much as possible, losses should be unanticipated than purposely orchestrated as is seen in many corporate organizations. The possible adoption of soft-laws, self-regulation and high sense of ethical behaviour has gained much prominence in the world of business. Financial intermediation is the flow of funds from surplus to deficit units. The units also known as market participants are made up of individuals, households, institutions or firms, governments and foreigners (Casu et.al 2006). One important issue bedeviling financial intermediation is information asymmetry. This menace has the tendency to lead to moral hazards and adverse selection. Most financial institutions have suffered from moral hazards on the part of clients expressed through default.

As most important financial intermediaries in developing and industrialized economies, banks have come under the microscopic eyes of regulators, central banks and direct and indirect stakeholders since their failure have damming consequences on the economy. Over the past decades, banks have suffered various forms of crises and the effects have descended down on firms of all categories causing total halt in such economies which make banks a major source of contagion especially during periods of crisis. Ensuring bank stability has taken both micro and macro dimensions. It sounds quite refreshing to hear of macro-prudential regulation of banks but bank self-regulation, internal discipline,

compliance and building of stakeholder confidence through internal controls will be better embraced.

Developments in the financial services industry especially with financial intermediation have been so rapid in recent times. New product development and innovation, diversification of financial services products, excessive competition, crave for significant market share through excessive branching into new geographical areas and desires to benefit from economies scale and scope have unnecessarily exacerbated the risk exposure of financial institutions and for that matter banks.

Shareholder value maximization- the prime objective of the firm requires that institutions minimize their risks as much as possible. In contrast to this, managerial risk aversion hypothesis which is traced from the agency argument holds that management will more often than not pursue actions to minimize their personal risks. Managers therefore engage in actions that may endanger the maximization of shareholder wealth. Irrespective of whether ensuring shareholder value maximization or managerial risk aversion, the issue of risk management must be addressed. This attempt to align the two divergent stances of shareholders and management is achieved through effective internal controls. Shareholders and other indirect stakeholders have confidence in an effective and efficient internal control system. It is also in the interest of management to see internal controls as a managerial tool rather than to antagonize the introduction of all forms of internal control measures.

Olatunji (2009) studied the impact of internal control system in banking sector in Nigeria but limited the scope of internal controls to fraud which is found under operational risk. Lakis and Giriunas (2012) also described internal controls as a measure to deal with fraud. Our present study builds on already existing works to provide a wider view of internal controls covering all the elements globally accepted and used like COSO and Basel Committee on Banking Supervision. Bedard (2011) used the US Sox internal controls which focus on financial reporting. Ji, Lu, and Qu (2015) focused on Chinese Sox internal controls which added among others organizational structure and human resource management. We use a broader scope of internal controls (COSO model) which covers five broad areas namely control environment, risk assessment, control activities, monitoring and information and communication systems.

In cases where other authors have used the COSO framework of internal controls, the main type of data has been primary sources collected through the use of questionnaires. We use purely secondary data to enable a more statistical analysis and a quantitative approach to model internal controls which the authors are yet to come across. Moreover, most risk management literature identified internal controls as operational risk issue but we extend the discourse to see if internal controls have any relation with credit risk. This approach provides another dimension of the relationships between internal controls and credit risk to add up to the already existing good works of the authors cited.

Jin et al. (2013) found that if banks comply with internal controls, they reduce their risk taking behaviour and are less likely to experience failure. The ramifications of credit risk for banks extend beyond the investors, to the industry, the nation and the international community. Credit risk issues have monetary implications and seriously jeopardize bank market discipline (Delis & Karavias, 2015). The aftermath of the global financial crisis has been very devastating for many nations including Spain. The banking industry has been hardest hit by Spain's economic downturn and the situation was described by Carballo-Cruz (2011) as the worst crisis the country has faced in the last fifty years. The volume of non-performing loans has been on the increase and many banks have collapsed bringing the number of savings banks from 45 in 2009 to 7 in 2014 (Chislett, 2014). Chislett reported that non-performing loans ratio moved from 0.6% in 2007 to more than 25% in 2014. The situation is a recipe for investigation hence the choice of the study area.

The purpose of this study is to examine the effectiveness of internal control mechanisms among Spanish banks, investigate exposure of Spanish listed banks to default risk as a result of poor internal control mechanisms and determine how internal controls affect credit risk.

The study will go a long way to make new revelations and confirm previous research on how internal controls affect not only operational risk as presented in most finance literature but also credit risk. The structure and effectiveness of internal controls is evident in the reporting of banks and this is explored to unveil its relationship with a core function of banks which is making loans. Thus the study reinforces prudence and cautiousness on the part of management even though the profit maximizing objective cannot be shirked in the process of discharging a critical function. This study opens a grey area in the use

of quantitative variables to study an area which hitherto has been studied with the use of primary data. The rest of the paper covers literature review, hypotheses and variables, design/methodology/approach, findings and conclusion.

4.3 Literature Review

The supply of funds from surplus to deficit units and vice versa should be an ongoing activity to ensure effective resource allocation. The financial system does this job better and financial institutions of which banks constitute the largest have a crucial role in this financial intermediation process. Banks are asset and risk transformers, liquidity providers and tools for implementing government financial and economic policies (Casu et.al, 2006; Mishkin, 2006). The Spanish banking industry comprise mainly three types of banks; commercial banks, savings banks and credit unions (Alama et.al, 2014). Unfortunately, the industry has witnessed very unpleasant moments in recent times for which Carballo-Cruz (2011) had no better way of describing than to say the worst crisis the country has experienced in the last five decades. Tracing the evolution of the crisis, the writer thinks it is an extension of the international financial crisis but emphasizes that internal imbalances in the pre-crisis period prepared fertile grounds for the crisis to escalate.

In an earlier study, Lozano-Vivas (1998) described the Spanish banking industry as so competitive that commercial banks had to adjust their deposits and loan rates. Unjustifiable adjustment of cost of funds have serious implications for the kind of credit market products and the processes of initiating, negotiating, funding, servicing and monitoring loans. The immediate effect of the crisis became evident at the demise of 38 savings banks within five years when their number reduced from 45 in 2009 to 7 in 2014. Chislett (2014) reported the abnormal rise in non-performing loans from 0.6% in 2007 to more than 25% in 2014 thus warranting an European Stability Mechanism for a bailout where about €100 billion was injected into the industry as a form of capitalization. The regionally based unlisted banks known as *Cajas* accounted for around half of the loans in the domestic banking system and are touted as orchestrators of the crisis. These *Cajas* exploited an existing weak and relaxed market coupled with political interference,

incompetent board of directors, reckless banking practice through over branching and over-ambitious investments (Chislett, 2014).

Ironically, as these *Cajas* were collapsing, they dissipated into commercial banks in the form of mergers and acquisitions thus infesting the commercial banks with their canker. In some cases, seven *Cajas* had to merge to form a bank. However, analysis from recent figures shows improvement in the books of the banking sector thus providing some light at the end of the tunnel. Profits for largest six banks have increased more than four times higher than 2012 and sharp drops in provision for loan losses. Non-performing loans are still higher but the increase is at a decreasing rate in relative terms. There have been efforts to enforce market discipline through the tripartite effort of Banco de España (BdE), Fondo de Garantía de Depósitos (FGD) and Fondo de Reestructuración Ordenada Bancaria (FROB). The Ministerio de Economía y Competitividad is also providing cooperation and support to come out with a framework for regulation (IMF, 2012). The IMF country report affirms the need to come out with stricter laws on internal governance that conforms to international standards. The picture about the Spanish banking industry makes it appropriate for study especially on the issue of bank internal governance (controls) and the resultant huge non-performing loans (credit risk). The situation is purely a managerial failure which is not uncommon in banking literature especially where the internal control system is weak for possible exploitation.

From a behavioural compliance theory approach, managers should do all they can to profile the company in a manner that consolidates a positive reputation which are inclined to sound corporate governance pedestals. Given new names such as soft laws and soft regulations (Morth, 2004; Sahlin-Anderson, 2004) managers should learn by intuition, to oblige to principles and best practices. The behavioral compliance theory draws motivation from efforts to rally support from stakeholders by raising the reputation of the company through compliance to corporate governance principles. Attempts to avert any negative profiling of companies or engaging in acts to ruin the reputation of the company on the part of managers are enforced through sound and established internal controls.

From the agency theory, managers may engage in actions that perpetuate their personal aggrandizement. Hart (1995) contends that there is a trade-off between incentives and risk sharing. The cost associated with possible conflict of interest between agents and

principals are known as agency costs. These according to Hart are traceable to auditing, budgeting, compensation and other forms of internal controls instituted to check management and employee misbehaviour. According to Letza et al (2008), the argument underlying the agency theory is that, managers will only act to maximize shareholder value if only it is not in conflict with his or her own personal self-interest. Managers or employees may carelessly initiate, originate and fund potentially unsuccessful loans if internal controls are not religiously adhered to. The many cases of credit risk expressed in non-performing loans, delinquencies and all forms of loan restructuring which makes the loan books dirty are traceable to poor adherence and non-compliance to established loan granting procedures. Some loan defaults are employee-caused, others are bank-caused and others are client-led. Internal controls seek to address the employee and bank-led causes of default. The deliberations above support the fact misbehaviour on the part of management (which in this case carelessly contracted loans is being cited) could be controlled with proper internal controls.

Most corporate governance literature underscores the indispensable role of internal controls in strengthening the governance structure of organizations (Maijoor, 2000). The long-term confidence of stakeholders-government, suppliers, investors, customers in the areas of reporting, accountability and reliable information is fortified with effective internal control systems (Rittenberg & Schwieger, 2001). The Committee on Sponsoring Organizations (COSO) (1992) defines internal controls as the process affected by the entity's board of directors, management and other personnel designed to provide reasonable assurance regarding achievement of effectiveness and efficiency of operations, reliable financial reporting and compliance with applicable laws and regulations. Following numerous corporate scandals, the US Congress passed a law which gave birth to the Sarbenes-Oxley Act 2002 which was seen as an improvement upon the COSO framework thus giving emphasis to monitoring and reporting. It is therefore not surprising to find most internal control research directed towards financial reporting. The SOX Act requires that management reports material internal control weakness to the board and external auditors. The adequacy of internal control systems and the attestation by independent auditors on the report by management is provided in the Act.

Basel Committee on Banking Supervision (2012) defined internal controls as ensuring that senior management establishes and maintains an adequate and effective internal control system and processes. The system and processes should be designed to provide assurance in areas including reporting (financial and operational), monitoring compliance with laws, regulations and internal policies, efficiency and effectiveness of operations and safeguarding of assets. After an extensive theoretical study of internal controls, Lakis and Giriunas (2012) defined internal controls as that part of enterprise management system ensuring the implementation of goals, effective economic-commercial performance of the enterprise, observation of accounting principles and effective control of work risks that enables the organization minimize the number of intentional and unintentional mistakes, to avoid frauds in the process of enterprise performance made by authority or employees. Their definition emphasizes effective risk management just as the Basel Committee on Banking Supervision definition.

In responding to changes in the business environment, the COSO framework has been revised in the year 2013 which pays attention to some of the SOX Act provisions. The new framework which was represented in a cubic shape covers the five elements (control environment, risk assessment, control activities, information and communication and monitoring), the objectives (operations, reporting and compliance) and level (entity, division, operating unit and function) (McNally, 2013). The revised framework identifies seventeen principles under the five broad elements. The control environment covers demonstration of commitment to integrity and ethical values, exercising oversight responsibilities, establishing structures, authority and responsibility, demonstrating commitment to competence and enforcing accountability. Under risk management, companies should specify suitable objectives, identify and analyse risks, assess fraud risk and identify and analyse significant change. The control activities comprise selecting and developing control activities in general and over technology and deploying policies and procedures. The next internal control element is information and communication and this covers the use of relevant information and communicating internally and externally. The final element is on monitoring and this is about conducting on-going and/or separate evaluations and evaluating and communicating deficiencies (McNally, 2013). This new framework is a combination of the SOX provision of communicating material internal control weakness.

From the deliberations, we try to define internal controls as a managerial tool which covers all set of daily activities in all areas of the organization, at all levels towards safeguarding the assets, ensuring compliance and transparency, communicating material weakness, protecting stakeholder interest in order to achieve the long-term goals of the organizational. We see internal controls as such a comprehensive activity that it covers the entirety of all that goes on in an organization. Even though external controls could be seen as a separate discipline, effective internal control systems should ensure that everything including external controls are religiously adhered to.

The benefits of observing internal controls are unchallenged. Although Bhagat and Jeffers Jr (2002) outline external governance and other factors as capable of aligning the interests of managers and owners, internal governance does this better and goes a long way to deepen ethical behaviour on the part of managers. Legislation provide a one-size-fits-all approach to curb misbehaviour, internal controls have proven very successful in the world of business as capable of minimizing the pursuit of opportunistic tendencies by management. Internal controls minimize the agency costs and therefore increase profits and sales of companies who invest in it (Alves & Mendez, 2004; Fernandez-Rodrogez et al. 2004; Gonchairu, Werner & Zimmermann, 2006). Internal controls enhance the reputation of listed companies which has the tendency to affect share price positively (Fombrun & Shanley, 1990). This was confirmed by Hart (1995) who contended that reducing agency costs increase firm value.

The essence of internal controls is to reduce information asymmetry, promote best practices in transparency and protect shareholders against the power of rulers (Salhi & Boujelbene, 2012). A critical look at most bank financial statements reveal very alarming figures anticipated as loan losses. This has been identified by American Institute of Certified Public Accountants (AICPA) (2006) as the top on the list of bank deficiencies. The observation of sound and effective internal controls is a major driver to investor confidence and earns the institution significant amount of reputational capital. The carelessness with which credit are initiated, funded, serviced and monitored has the tendency to trigger default, crisis and bank failure. Jim, Kanagoretnam and Lobo (2013) found that banks without proper internal controls could grow temporarily but they have higher likelihood of failing in the near future. This defeats the going concern concept of organizations of which banks are no exception. In tracing the path to bank failure, the first

stop point is credit risk which experienced through borrower default before liquidity and insolvency sets in. There is no bad borrower but always a bad lender. The trajectory of bank failure follows that credit risk leads to liquidity risk then to insolvency, bankruptcy and then failure. When banks fail, there is a greater disincentive to depositors, investors and the externalities on other banks.

The effectiveness of internal controls have been studied along the dimensions of the efficiency and effectiveness of activities, reliability of information and compliance with laws and regulations (Jokipii, 2006). Internal control systems were developed by the Basel Committee on Banking Supervision to ensure prudence and stability in the financial system. Anecdotal evidence from numerous bank failures and even the quite recent financial crisis gives support to the fact that credit is a major contributory factor to these failures. Banks benefit from transforming their liabilities into assets thus an incentive for optimal risk benefit behaviour is pursued but bank managers owe their principals a duty of care (fiduciary relationship).

Moral hazards and adverse selection emanates from the exploitation of informational economies by counter parties and can be best be minimized if management is extra careful in its asset creation function. There is much empirical support to the fact that loans constitute the greatest proportion of bank assets (Casu et.al, 2006; Mishkin, 2006). Ellul and Yerramilli (2013) reported that financial institutions with strong internal risk controls are able to survive financial crises and refute the claim that the financial crisis did not affect all institutions the same way as speculated by some experts in finance. It is not uncommon to find bank managers over-ambitiously creating very risk assets (credit facilities) in the name of higher return expectation. Although there is a myriad of factors that contribute to credit risk, the most avoidable ones could be dealt with if there are sound and religiously-adhered-to internal controls within the institutions.

The rate of credit defaults has been so alarming in all areas of the financial services industry. GAO (1994) expressed worries about a seemingly unjustifiable provision for loan losses which lack evidence. Although the work of (Altamuro & Beatty, 2010) addressed this conservative attitude, they did not study the exact relationship between internal controls and credit risk. It was reported in separate in separate studies that weak internal controls affect loan loss provision (GAO 1991;1994).

The study has been presented in the conceptual framework that combines all the necessary elements of internal controls widely used by researchers in this field.

4.4 Conceptual framework

The framework for the study comprehensively encompasses all the elements of internal controls which are control environment, risk assessment, control activities, monitoring and information and communication systems. The key objectives of internal controls are effectiveness and efficiency of operations, reliability of financial reporting and compliance with applicable laws. These cardinal objectives of internal controls and attributes which are preventive, detective and curative have all been covered in the study.

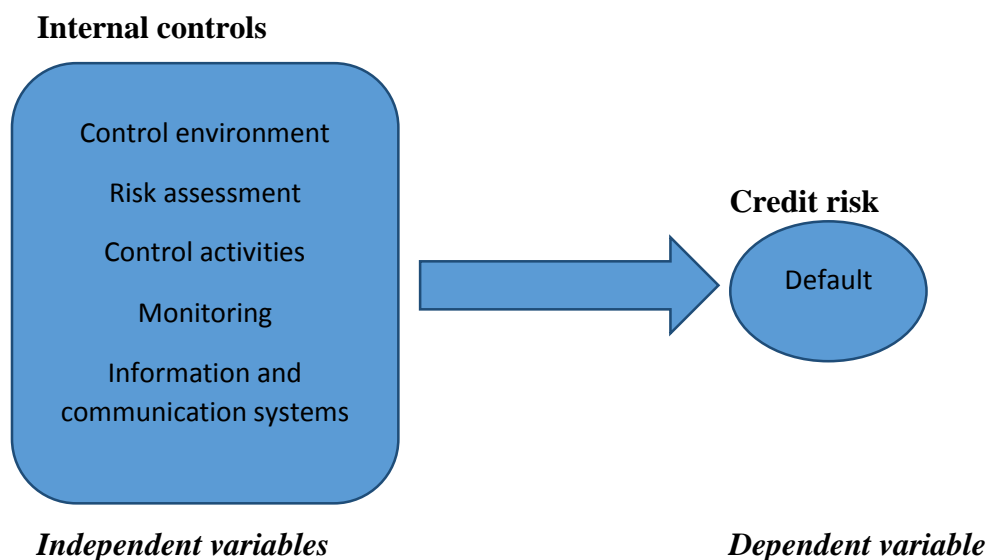


Fig 4.1: Effect of internal controls on credit risk (Author's construct)

4.5 Variables and hypotheses

Credit Risk

It is gradually becoming alarming the amount of provision for loan losses. This has been identified by AICPA (2006) as the number one deficiency of banks. Hassan Al-Tamimi and Mohammed Al-Mazrooei (2007) studied UAE banks and reported that among three most important risks facing the banks was credit risk. Credit risk is the likelihood of a

borrower or counter party defaulting in the conditions of a loan agreement, contract or indenture either in part or in full (Sobehart, Keenan & Stein, 2001). Banks stand to enjoy benefits of enjoying reputation capital, attracting more investments and being more profitable if they take risk management very serious. There is evidence that banks which have paid particular attention to risk management have benefited from credit availability which led to the creation of better bank assets and profitability (Cebenoyan & Strahan, 2004). Banks in Japan have had souring figures in the amount of non-performing loans and provision for loan losses which are normally used as proxies for credit risk (Fukuda et al., 2009). The writers reported of the warning from the Japanese government on the need for banks to reduce non-performing loans since it has seriously affected the financial health of the banking industry.

Salas and Saurina (2002) studied Spanish commercial and savings banks and found that credit risk measured by non-performing loans is by bank size and rapid credit expansion. Further evidence is provided about Spanish banking industry that lenient credit terms among other factors determines non-performing loans (Saurina & Jimenez, 2006). The cases of rapid credit expansion and lenient credit terms are traceable to weak internal control structures. Credit risk affect the bank reputation and translate to other risks especially in situations where internal governance mechanisms are very weak (Mamiza Haq et al., 2014). This makes credit risk an important issue for banks to deal with and we therefore use it as the dependent (outcome) variable around which internal controls and other bank specific factors revolve. From the discussions above, we conjecture a relationship between internal controls and credit risk and therefore hypothesize that:

There is significant relation between internal controls and credit risk.

Board Size

The size of the board of directors have influences over deliberations and control over management (Aliyu, Jamil, & Mohamed, 2014). There are different schools of thought as to whether large or small board sizes positively affect performance of firms. Small board size reduce the agency cost associated with large board size (Eldenburg, Hermalin, Weisbach, & Wosinska, 2004). (Uwuigbe & Fakile, 2012) chastised large board size for

ineffectiveness and possible lack of coordination as compared to smaller board size. On the other hand (C. H. Chen & Al-Najjar, 2012) confirmed that large board size contributes positively to the performance of firms. Although this study is not about board size and performance, the bottom-line is the board's ability to contribute to deliberations, provide reliable information and avoid manipulations in board decisions. We therefore hypothesize that:

Board size significantly affects credit risk.

Board Expertise in Finance

The numerous corporate scandals that occurred at the blind side of the board of directors of affected companies has brought caution to board composition. Some authors refer to it as board experience. Most board members especially for banks require that at least a good number of them should have some form of expertise in Banking and Finance. This requirement is given emphasis in the Sarbanes-Oxley Act of 2002. (Burak Güner, Malmendier, & Tate, 2008) reported that board members with finance background significantly affect capital budgeting and capital structure decisions and policies of non-banks. We abstract from this finding and expect that with their expertise, board members with finance background should be capable of taking good risk assessment decisions which is a major pillar of internal control systems. Interesting and varying results on board expertise in finance were discovered in the pre and peri crisis period on the stock performance of banks (Settlements, 2010). We hypothesize from the above that:

Board expertise in finance significantly affects credit risk.

Management Experience

Apart from the board being experienced in finance, management should also be on top of their jobs. The agency problem rests so much on managerial decisions. The experience of management will go a long way to determine the kind portfolios they construct as well as other critical investment decisions (Burak Güner et al., 2008). The risk management element of internal controls requires that management become very experienced to ensure

effective risk management and internal control. (Ikpefan & Ojeka, 2013) cited Central Bank of Nigeria (2006) that management and board expertise were vital corporate governance requirement to ensure effective internal governance. We therefore hypothesize that:

Management experience has significant relationship with credit risk

Revenue Diversification

Bank managers in their quest to be more profitable diversify their investments to have revenues from non-loan sources. The nature of financial intermediation has changed and banks have diversified their revenues tremendously (Mamiza Haq et al., 2014). The incentive for banks to diversify, stems from related factors like bank size, management and board expertise and competition within the industry. Within the internal control framework, the extent and nature of diversification is captured as an important element which could be bring about management misbehaviour(S. J. McNally, 2013). There are mixed reports about the effect of diversification on non-performing loans and in some cases no relation is reported at all (Hu, Li, & Chiu, 2006). We anticipate a significantly positive relationship between diversification and credit risk since the incentive to be more profitable increases the risk exposure of banks as they expand and diversify. We hypothesize that:

Revenue diversification has significant positive effect on bank credit risk

Board Independence

One of the internal control elements is monitoring which is mostly performed by the board of directors. This means that if the board is very independent, there is the tendency for a better monitoring function. The ability for an independent board to be more efficient in monitoring management is given support from literature (Eling & Marek, 2009); (Pathan, 2009). Eling and Marek found that monitoring had significant effect on risk taking behaviour of insurance companies in the UK and Germany. An earlier report by (Agrawal & Mandelker, 1990)) revealed that monitoring should be actively done and that board

members can be large in numbers and independent but not active. We therefore hypothesise that:

Board independence significantly affects bank credit risk

Compliance, Prudence and Safety

Banks are the most heavily regulated institution because of the risky nature of their business (Mishkin, 2006). Not all deposits are allowed to be given out as loans hence some reserve requirements should be kept against liquidity problems. Such practices ensure prudent bank management and safe keeping of bank assets (Casu et.al, 2006). Internal control systems ensure compliance with such regulatory requirements. We hypothesize that:

Compliance, prudence and safety significantly affect credit risk

Audit Quality

The whole discipline of internal control falls within the domain of auditing. The audit committee performs a monitoring function to ensure sound and acceptable financial reporting and corporate accountability. Audit committees perform internal governance function to protect the company from impairment suffered from reputational risks (Y. Zhang, Zhou, & Zhou, 2007). It is expected banks with good audit quality will enhance effective internal control systems and therefore reduce credit risk. We hypothesize that

Audit quality has significant relationship with credit risk

Quality and reliability of financial information

Stakeholders would want to express confidence in the timeliness and reliability of financial information management present. Especially with regulators, compromises with this condition attract fines and sanctions. Reliable financial information is an audit function banks would want to engage first class auditors to earn the organization some reputational capital (Zhang et al., 2007).

The quality and reliability of financial information significantly affect credit risk.

Apart from the independent variables, there are some variables which can influence credit risk but are not directly captured as internal control variables. These variables are controlled in the study and can be seen below.

Bank Size

There is enough literature support for bank size to affect decisions of internal controls and bank operations (Laeven & Levine, 2008); (Laeven & Levine, 2009). There is the tendency for large banks to be more very mindful of internal controls than small size banks. Size can determine the variety of credit products available to a financial institution (Eling & Marek, 2009). Small firms are likely to have lesser incentive to improve internal controls (Ashbaugh-Skaife, Collins, & Kinney, 2007); (Doyle, Ge, & McVay, 2007) whilst larger banks might be well-resourced to invest in internal controls. Bank size was found to have negative relation with credit risk measured by non-performing loans (Hu et al., 2006). We therefore control for bank size and hypothesize that:

Bank size significantly affects credit risk

Bank Age

Age of business affect the kind of investment and financing decisions. So much experience is acquired and companies which have been in business for long have good links and access to a lot of opportunities than new and upcoming ones. It is reported firms that have existed for long have less material internal control weakness (Tang, Tian, & Yan, 2014). We hypothesize that:

Bank age significantly affect credit risk

Profitability intent (Net Interest Margin)

Altman (1968) and Hillegeist et.al (2003) found that a company could probably fail if it is unprofitable and highly leveraged. In a bid to avoid failure, banks pursue efforts to be very profitable (Shumway, 2001). There are various measures of profitability but the nature of the study focuses so much on loan activities so the most appropriate measure of profitability is net interest margin. We argue that the tendency to maximise profits which is very common with management could affect the kind of assets created. We therefore hypothesise from these abstractions that:

Net Interest Margin significantly affects credit risk

Corporate restructuring

When companies are restructured through a merger or acquisition or by any kind, the rules of engagement may change including internal controls. Chen et.al (2013) found evidence of relation between corporate restructuring and internal control practices. It is therefore likely that after a restructure, internal control systems might improve or deteriorate which can affect the loan decisions and credit risk. We therefore conjecture that:

Corporate restructuring significantly affects credit risk

Leverage

The composition of debt in a bank's capital structure exposes it to some consequences and especially when default rate is high, servicing these debts becomes a problem. Corporate failure could emanate from high leverage (Altman, 1968; Hillegeist et.al, 2004). We therefore hypothesize that:

Leverage significantly affects bank credit risk

4.6 Design/Methodology/Approach

The study design is purely a quantitative approach to establish the relationship between internal controls and credit risk. The statement and statistical test of hypotheses makes our study a deductive approach. Secondary data was obtained from Bankscope for eight banks listed on the Spanish Stock Exchange which had data available on over fifteen variables from the period 2004-2013. The sample description can be found in Table 4.1.

Table 4.1: Description of sample and variables

Variable	Number of observations		
	Required	Actual	Missing
Bank	80	80	
Year	80	80	
NPL/TotLoans	80	75	5
Loan/Deposit	80	78	2
Loans/TotAssets	80	78	2
NonEarningAsset/TotAssets	80	78	2
TotalAssets	80	78	2
Boardindependence	80	73	7
BoardExpertiseinfinance	80	73	7
ManagementExperience	80	73	7
BoardSize	80	73	7
AuditQuality	80	75	5
AgeofBusiness	80	75	5
NetInterestMargin	80	75	5
Newbranches	80	75	5
CorporateRestruc	80	75	5
DebtTotalAssets	80	75	5

The table above shows the variables, the expected number of observations, actual observations available for analysis and the missing values.

We also obtained corporate information about board members and management from the company websites. The banks involved in this study had been operative for at least seven years within the ten-year study period. Our sample period covers some pre-crisis period to post-crisis period to ensure some balance even though we did not use any baseline period. We used listed banks because these are the banks that report major internal control information for public use. There are basic requirements about corporate governance and board characteristics of listed companies which is very crucial in this study. The unavailability of data for certain years on certain variables makes the data unbalanced, however basic assumptions regarding the use of panel data were met thus justifying the study.

4.7 Empirical models

We propose a general equation for the study that credit risk is a function of internal controls. This equation is further decomposed to arrive at the overall model that contains all the independent and control variables using their proxies. From equation (1)

$$CR_{it} = f(INTCONT) \dots\dots\dots (1)$$

Where

CR_{it} = Credit risk for bank i for the time period t

$INTCONT$ = *internal controls*

The equation (1) above covers the topic that credit risk is a function of internal controls which means that there is a linear relationship between internal controls and credit risk. We decompose equation (1) to obtain the variables representing internal controls to obtain (2)

$$INTCONT = f(bodindp, bodexpfin, bodsize, mgtxp, lns/dep, lns/totass, nea/totass, , audqua, nwbrnch) \dots\dots\dots (2)$$

Internal controls as explained by the COSO report cover five broad elements which are control environment, risk assessment, control activities, monitoring and information and communication systems (Chen, Dong, Han, & Zhou, 2013). These elements have been

represented by the variables like board independence (*bodindp*), board expertise in finance (*bodexpfin*), board size (*bodsize*), management experience (*mgtxep*), loans to deposit ratio (*lns/dep*), loans to total assets(*lns/totass*), non-earning assets to total assets (*nea/totass*), audit quality(*audqua*), new branching (*nwbrnch*). These variables which cover all the five broad domains of internal controls found in the conceptual framework constitute the independent variables for the study.

We indicate that there are bank-specific and other variables which could affect the dependent variable in one way or the other and must be controlled. These variables are bank size (*Bnksz*), bank age (*bnkage*), profitability intent (*NIM*), corporate restructuring (*corpres*) and leverage (*lev*). When all the independent and control variables are included in the regression model, we obtain equation 3.

$$LLP/TL_{it} = \beta_{0it} + \beta_{1it}bodindp + \beta_{2it}bodexpfin + \beta_{3it}bodsize + \beta_{4it}mgtxep + \beta_{5it}lns/dep + \beta_{6it}lns/totass + \beta_{7it}nea/totass + \beta_{8it}audqua + \beta_{9it}nwbrnch + \beta_{10it}bnksz + \beta_{11it}bnkage + \beta_{12it}nim + \beta_{13it}corpres + \beta_{14it}lev + \varepsilon_{it} \dots\dots (3)$$

where the subscripts *i* denotes Spanish Listed Banks (*i= 1,2,3,4..... 71*), *t* represent time period (*t= 2004, 2005, 2006.... 2013*), $\beta_1, \beta_2, \beta_3, \dots, \beta_{14}$ are the parameters to be estimated and ε represent the idiosyncratic error term.

The independent variables which are the elements of internal control and the control variables have been included in equation (3) for the general model.

Although the data is not perfectly balanced panel due to data unavailability for some banks in some years for some variables, the data passed reliability tests thus making the results very reliable. We use Generalized Least Squares regression to estimate the econometric model. Two main estimation techniques are used for GLS which are random effect and fixed effect models. Usually, for panel data (times series cross-sectional data) fixed effect models controls for all time-invariant differences between the individuals so the estimated coefficients cannot be biased hence fixed effect model estimation is not ideal for time-invariant causes of the dependent variables (Torres-Reyna, 2007). For random effect estimations, the assumption is that the entity's error term is not correlated with the predictors thus allowing for time-invariant variables in the explanatory variables.

Torres-Reyna reported that random effect allows for generalization of inferences beyond the sample used. Hausman's test was performed to ensure reliability of data sets and also help select the most appropriate between fixed and random effects. Hausman's test tests whether the unique errors are correlated with the regressors. The Hausman's test suggested the use of random effect results for the regression. The random effect technique is robust to first order autoregressive disturbances (if any) within unbalanced panels and cross-sectional correlation and or heteroskedasticity across panels (Pathan, 2009). A summary of the dependent, independent and control variables with their exact measures and expected signs have been provided in Table 4.2.

Table 4.2: Definition of variables

Internal control element	Variables	Proxy variables	Expected Signs
Dependent Variable			
	Credit risk	Non-Performing Loans to Total Loans	
Independent variables			
Control environment	Board size	Number of board members	+/-
Risk assessment	Board expertise in finance	Number of board members with banking or finance background as ratio of total board members	+/-
	Risk exposure	Ratio of Non-earning assets to total assets	+/-
	Management experience	Number of management members with at least five years' experience	+/-
Control activities	Diversification	Number of yearly new branches	+/-
	Ensuring credit limits	Loans to total assets ratio	+/-
	Compliance and Prudence	Loans to deposit ratio	+/-

Monitoring	Board independence	Number of independent board members as a ratio of total board members	+/-
		Use of top six auditing firms	+/-
	Audit quality		
Information and communication systems	Reliability of financial reports	Timeliness of financial information and adherence to international standards	+/-
Control Variables			
	Bank size	Logarithm of total assets	+/-
	Bank age	Number of years in business	+/-
	Profitability intent	Net Interest Margin	+
	Corporate restructuring	Dummy variable of 1 if bank has restructured and 0 if not	+/-
	Leverage	Debt to total assets	+/-

Table 4.2 shows the definition of dependent variable, elements of internal controls, our main independent variables and control variables. In all cases, some proxy variables were used to suit the nature of the study and these can also be found including the expected signs.

4.8 Descriptive statistics

The descriptive statistics covers the dependent, independent and control variables used in the study over the ten-year period.

Table 4.3: Descriptive statistics

variable	mean	max	min	sd	skewness	kurtosis	p50
NPLTotLoans	3.793453	19.56	.27	4.073303	1.995312	7.492439	2.66
LoansDeposit	1.074995	1.497998	.6033253	.178887	.1513604	2.868119	1.077153
LoansTotAs~s	.6926197	.8606263	.5223484	.0952179	.0155338	1.763342	.6896575
NonEarning~s	.0698189	.1550488	.0154269	.0337686	.2425023	2.408426	.0727355
TotalAssets	3.59e+08	1.68e+09	1483779	4.63e+08	1.611447	4.553111	1.42e+08
Boardindep~e	.4579452	.786	.19	.1511041	.4903246	2.634548	.45
BoardExper~e	.8990064	1	.5238095	.1171934	-1.534463	4.646694	.9333333
Management~e	.9978256	1	.9444444	.0106035	-4.661183	22.84297	1
BoardSize	14.9589	21	8	3.878138	-.1801839	1.65548	15
AuditQuality	1	1	1	0	.	.	1
Ageofbusin~s	80.45333	156	0	56.69389	.0671837	1.412734	80
NetInteres~n	1.91596	2.95	.094	.5678443	-.1342021	3.022213	1.906
Newbranches	118.3733	2212	-612	380.7738	2.358308	14.12196	55
Corporater~g	.36	1	0	.4832324	.5833333	1.340278	0
DebtTotalA~s	.9418331	.9656088	.91568	.0107296	.2103136	2.917855	.941469

A critical look at the mean (3.79%) and standard deviation (4.07%) for the dependent variable NPL shows relatively lower mean for the sample compared to the national current average of about 13%, there is so much variability as can be seen from the standard deviation. It can also be seen that the dependent variable is positively skewed and peaked with reference to the skewness and kurtosis. The means for the board characteristics like board independence and board expertise in finance and management experience are very encouraging with the ratios very close to one. The mean board size of almost 15 is an indication of relatively higher board size. However, apart from management experience, the skewness and peakness of the board and management characteristics are normal. The mean loans to total asset of almost 70% indicate over-reliance of loans as the core of bank assets. The mean age and number of new branches of banks sampled is 80 years and 118 respectively. Mean bank profitability intent of approximately 2% and the minimum, maximum and median values are consistent with normal practice and acceptable. A detailed display of the descriptive statistics which covers the mean, maximum, minimum, standard deviation, skewness, kurtosis and median can be found in Table 4.3. The study reports strong positive correlation between

the number of years a bank has existed and the control environment, risk management, control activities, profitability intent and bank size. The association between the other variables can be found in the correlation matrix which can be found in Appendix 4.1. The explanations of the abbreviated forms of the variables which is a key to the Pearson's correlation matrix also found in Appendix 4.2.

4.9 Findings

The study sought to examine the effectiveness of internal control systems, explore the exposure of Spanish listed banks to default problems and establish the relationship between internal controls and credit risk. The effectiveness of internal controls is seen from the descriptive statistics. The mean values for control environment, risk assessment, control activities and monitoring are indications of attempt to make provision for effective internal control systems. There is high board independence, large board size, experienced management and high quality auditors. The study reveals that there is excessive desire to expand through over branching. This has serious implications for cost of maintaining branches and controlling activities. There is the tendency for head office to lose control in monitoring effectively what goes on in all branches at all times.

When there is proliferation of bank branches in specific geographical areas, credit pollution through multiple borrowing is likely to occur since the same clients will receive duplicated credit services from different branches (Steinwand, 2000). The loan to deposit ratio of more than one (1) indicates that all deposits are absorbed by loans a situation which could trigger liquidity problems should there be any delay in the servicing of the loan. There is over-reliance on loans as the major asset component. This does not commensurate with the long years of existence and experience and expertise of board and management. Bank profitability intent is maintained within normal practice there is the need to compliment it with good banking practices in order to keep credit risk in control.

Variables like loans to deposit ratio debt to total asset ratio cast doubts on risk assessment function of top management and board. The encouraging figures for the characteristics of the board, management and auditors do not reflect the figures for monitoring, control environment, risk management, control activities and information and communication.

This confirms (Agrawal & Mandelker, 1990) who emphasized board effectiveness and not necessarily board characteristics. The conditions created exposes Spanish banks to so much credit risk conditions. Risk taking decisions should be done upon careful risk assessment, measurement, implementation and evaluation. There were no evidence of reporting material internal control weakness and this seriously increases the risk exposure of banks.

The study finds very encouraging positive results for the independent variables. The results show that internal controls explain credit risk very much. The R-squared value indicates that 72% of variations in credit risk is attributable to internal controls. This can be found in Table 4.4. The result indicates that internal controls are capable of determining credit risk. The result confirms the works of (Ashbaugh-Skaife et al., 2007) who found some association between internal controls and several risk measures like idiosyncratic risks and higher systematic risk. We find an improvement in the works of Kim, Song, and Zhang (2011) who reported no relation between internal control weakness and credit risk. It was reported by Chen, Dong, Han, et al. (2013) that effective internal control system ensures good financial reporting and increases the confidence of investors on the capital market. In the case of banks as found in this case, if effective internal control systems are enshrined, the already waning public confidence in the Spanish banking industry as a result the collapse of several savings banks and over-indebtedness could be repaired to some extent. The emphasis on effective internal controls was found by Ellul and Yerramilli (2013) who reported that financial institutions with strong internal risk controls survive financial crisis. This is confirmed in our study looking at the explanatory power of internal controls to credit risk. The result is again in tandem with the findings of Tang et al. (2014) who found that internal control material weakness increases credit risk of firms. The authors established some relationship between internal controls and credit risk as has been found in our study.

Looking at the individual explanatory variables, seven of them significantly explain credit risk at least at 95% confidence interval. Board size falls under the purview of control environment in the internal control framework. It is found that board size significantly affect credit risk. This finding agrees with (Aliyu et al., 2014) who reported that board size influences good decisions and control. An effective control environment created by

the board as a result of their size ensures segregation of duties and good human resource capacity.

Table 4.4: Random effects, fixed effects and Hausman's test results

Variables	(1) Fixed effects	(2) Random effects	(3) Hausman test
LoansDeposit	-4.247 (4.166)	-8.888** (3.739)	-8.888** (3.739)
LoansTotAssets	-14.116 (12.055)	13.822* (8.147)	13.822* (8.147)
NonEarningAssetTotAssets	70.676*** (26.055)	122.642*** (17.166)	122.642*** (17.166)
TotalAssets	0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Boardindependence	5.109 (5.092)	10.149** (4.099)	10.149** (4.099)
BoardExperticeinFinance	6.333 (7.676)	13.016** (6.251)	13.016** (6.251)
ManagementExperience	-11.938 (35.714)	-27.099 (36.456)	-27.099 (36.456)
BoardSize	0.601* (0.337)	0.514*** (0.169)	0.514*** (0.169)
Ageofbank	0.076* (0.044)	-0.034** (0.015)	-0.034** (0.015)
NetInterestMargin	-4.538*** (1.222)	-4.304*** (1.102)	-4.304*** (1.102)
Newbranches	-0.001 (0.001)	-0.002* (0.001)	-0.002* (0.001)
Corporaterestructuring	0.235 (0.870)	0.828 (0.896)	0.828 (0.896)
DebtTotalAssets	-42.671 (54.149)	-21.349 (49.283)	-21.349 (49.283)
Constant	47.236 (62.060)	29.993 (58.239)	29.993 (58.239)
R-squared	0.724		
Sample size	73.00	73.00	73.00

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The positive correlation between control environment and credit risk rather confirms that larger board sizes do not necessarily ensure sound control environment (Uwugbe & Fakile, 2012) contrary to the claim by Chen and Al-Najjar (2012) that larger board sizes

ensure effective monitoring. In the study of Tunisian banks, (Salhi & Boujelbene, 2012) found same positive relation between board size and bank risk taking.

It is found that loan-to-deposit ratio which is a proxy variable for compliance and prudence found under the control activities element of the internal control framework significantly explained variations in bank credit risk. Control activities include ensuring approval limits are observed, minimizing conflict of interest and ensuring segregation of duties (Basel Committee on Banking Supervision, 2010). Although the result shows very significant relation between control activities and credit risk, the correlation coefficient surprisingly shows a negative relationship. This is contrary to our expectation and might be an indication of improper enforcement of these internal control mechanisms as reported by (Agrawal & Mandelker, 1990). They attribute such weaknesses to inactive board of directors.

Board expertise in finance and non-earning assets to total assets were used as proxy variables for risk management component of the internal control framework. The results show significant effect of risk management decisions on credit risk but report a positive relationship which is contrary to our expectation. The risk management function of board and management members is a function of their expertise and experience. The expertise of top management and board goes a long way to minimize internal control weakness (Ikpefan & Ojeka, 2013). The study confirms the assertion by Ikpefan and Ojeka since all the two variables for risk management were significant on the dependent variable. The result converges with the findings of (Burak Güner et al., 2008) that board members with finance background significantly influence investment (including credit) and financing decisions. It is however interesting to find that a strong positive correlation existed between the risk management function of board and management on one side and credit risk. It stand to suggest that, these provisions are made but the implementers are not being effective as reported by (Agrawal & Mandelker, 1990). The result seem to disagree with (Settlements, 2010) who did not find the influence of board finance expertise in his study.

Board independence which falls under the monitoring component of the internal control framework significantly affects credit risk. The ability of independent board members to significantly affect risk taking behaviour, corporate decisions and overall performance has been confirmed (Eling & Marek, 2009); (Pathan, 2009) and the result adds up to those

schools of thought. It was reported by (Erkens, Hung, & Matos, 2012) that financial firms with large board independence increased their risk taking behaviour. This is not different from the positive relation our study has found between board independence and credit risk.

How long the bank has been in existence significantly affected credit risk and the correlation was a negative one which means that the longer the years in business, the better the bank can minimize credit risk and vice versa. This was an expected result and confirms the findings of who found that the longer the years in business, the better the internal control system and vice versa (Tang et al., 2014). The study found that the intention to be profitable (measured by net interest margin) significantly affected credit risk (Shumway, 2001). This could lead to over-ambitious credit facilities which might eventually go bad. However, our expected negative correlation between profit intention and credit risk was not sustained.

It was found that all the banks used the top six international auditing firms so audit quality was dropped for collinearity in the running of the results. Again, financial information was reported on timely basis and as required so there was no need including that in output. The result confirms earlier studies on the relationship between internal controls and risk. (Ashbaugh-Skaife, Collins, Kinney, & Lafond, 2009) found that weak internal control systems significantly resulted in higher idiosyncratic and systematic risks of firms.

4.10 Conclusion

The formalities of ensuring that internal control mechanisms are in place is unquestionable about Spanish banks as it can be seen that at least four of the internal control elements were significant predictors of credit risk. However, their effectiveness cannot be guaranteed because their correlation coefficients do not depict that there are effective internal control systems. Where there are effective controls, there should be inverse relationships between internal control variables and credit risk but the reverse was the case in our study. Large board size, very independent board and high expertise and experience of board and management could not ensure control of excessive branching thus resulting in increasing non-performing loans. The situation does not guarantee for

effective internal controls. It is possible that since independent board members have no investment to protect, they were caught by the usual agency problem.

The seemingly ineffective internal control systems and the absence of strict enforcement of disclosure of material internal control weakness exposes the listed Spanish banks to major risks. This is because credit risk is a starting point for potential liquidity risk, insolvency and possible failure as have been witnessed in Spain. It is not surprising to see quite some number of banks no longer in operation; a situation that impairs public confidence in the banking system.

There is significant effect of internal controls on credit risk. The control environment, risk management, control activities and monitoring significantly affect credit risk. Board independence, expertise, large size and management experience does not guarantee effective internal controls. The agency problem still exists with independent board members who are not motivated to protect shareholders' investments. Internal control is not only under the purview of operational risk but also credit risk. When internal governance is effective, credit risk could be minimized. It is therefore not out of place to say that there is no bad borrower but a bad lender. Given that internal control systems were effective, some of the catastrophes (collapse of banks) could have been avoided. The situation whereby Spanish banks do not report material internal control weakness is not in the best interest of stakeholders and a full adoption of the revised COSO internal control framework that emphasizes reporting material internal controls will improve upon the situation.

4.11 Limitations/implications

The absence of data in certain years did not make the data a balanced panel data set. Inactiveness of some banks in recent times did not allow the involvement of a larger number of banks thereby limiting the sample size. In any case, the sample size satisfied basic assumptions of the linear regression model. Data was not available on certain planned variables although there were proxy variables used. The use of quantitative variables for such a study does not allow for much flexibility and in-depth scrutiny of internal control systems. The study compliment research with primary sources of data

therefore providing a systems approach to investigating internal controls. These limitations do not cast doubts about the results though. The study has implications for policy makers, the Spanish Central Bank, potential investors and the general public as a whole. There are various schools of thought on the need to enact laws on internal controls (especially on reporting material internal control weakness) as can be found in the US, Britain and China. The study provides insight for such steps in to be initiated in Spain and other parts of Europe which might find this call worthy.

4.12 Practical implications

Banks have existing internal control systems and observe some of the principles. The study found that financial reporting and involvement of high class auditors was the practice of all the banks. Some banks are no longer in business leading to the involvement of only eight banks which was not the situation in Spain some few years ago. Practically, the result provides much confirmation as to how effective internal control systems could help minimize credit risk. This brings on board a new dimension of establishing the relationship between credit risk and operational risk because most risk management research classifies internal controls under operational risk. Bank management should not only consider internal controls as an operational risk issue but also credit risk. Again, it is not enough just to have the control mechanisms in place but the full implementation thereof. Shareholders should be wary of independent board members for their lack of motivation to protect the interest of shareholders (agency problem).

4.13 Social implications

Banks through financial intermediation keep the economy running. Banks owe it a social responsibility to stay in business. The failure of banks affects depositors through the loss of investments which brings serious externalities on other banks. When one bank fails, the confidence of public in banks is seriously impaired. The study emphasizes the social capital banks gain through effective and reliable internal control systems especially when material internal control weaknesses are reported.

4.14 References

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Appendix 4.1

Pearson's correlation coefficients (Pair wise 2 sided)

	AB	BEF	BI	BS	CR	DTA	LD	LNTA	LTA	ME	NB	NEATA	NIM	NPLTL	TA
AB	1														
BEF	0.46*	1													
BI	0.631*	0.1361	1												
BS	0.0387	-0.603*	-0.064	1											
CR	0.3352*	0.1991	0.2076	0.1231	1										
DTA	-0.03	0.1812	0.1196	-0.296*	0.0046	1									
LD	-0.248*	0.3381*	-0.369*	-0.326*	0.1016	-0.134	1								
LNTA	0.638*	0.3654*	0.2262	0.0971	0.3204*	-0.261*	-0.135	1							
LTA	-0.495*	-0.065	-0.294*	-0.093	-0.188	0.062	0.582*	-0.771*	1						
ME	0.0356	-0.086	0.1098	-0.167	0.0288	0.1488	-0.259*	0.017	-0.282*	1					
NB	0.2093	0.1064	-0.051	0.1492	0.2412*	0.1482	0.007	0.178	-0.156	0.039	1				
NEATA	0.6599*	0.2719*	0.2397*	0.0917	0.209	-0.368*	-0.203	0.6975*	-0.62*	0.1812	0.1854	1			
NIM	0.5508*	0.1764	0.4022*	0.2969*	0.0605	-0.408*	-0.163	0.3288*	-0.11	-0.255*	-0.025	0.3647*	1		
NPLTL	0.0648	-0.023	0.0757	0.0931	0.1497	-0.104	-0.181	0.1254	-0.201	0.1516	-0.036	0.4724*	-0.161	1	
TA	0.6521*	0.0488	0.2635*	0.341*	0.0771	-0.194	-0.412*	0.7774*	-0.725*	0.1151	0.2596*	0.6569*	0.4667*	0.0101	1

NOTE:

* indicates $p < 0.05$

APPENDIX 4.2

Key for abbreviated variables

NPL_Tot Loans	NPLTL
Loans_Deposit	LD
Loans_Tot Assets	LTA
Non-Earning Asset_Tot Assets	NEATA
Total_Assets	TA
Natural Logarithm of Total Assets	LNTA
Board independence	BI
Board Expertice in Finance	BE
Magement_Expertise	ME
Board Size	BS
Age of business	AB
Net Interest Margin	NIM
New branches	NB
Corporate_restructuring	CR
Debt_Total Assets	DTA

CHAPTER FIVE

**INTERNAL CONTROLS AND CREDIT RISK RELATIONSHIP AMONG
BANKS IN EUROPE**

5.1 Abstract

Purpose: The study purport to investigate the effectiveness of internal control mechanisms, investigate whether evidence of agency problem is found among banks in Europe and determine how internal controls affect credit risk.

Design/methodology/approach: Panel data from 91 banks from 23 European Union countries were studied from 2008-2014. Hausman's specification test suggest the use of fixed effects estimation technique of GLS. Quantitatively modelled data on 15 variables covering elements of internal controls, objectives of internal controls, agency problem, bank and country specific variables were used.

Findings: The study finds effective internal control systems because objectives of internal controls are achieved and they have significant effect on credit risk. Agency problem is confirmed due to significant positive relation with credit risk. There is significant effect of internal controls on credit risk with specific variables as risk assessment, return on average risk weighted assets, institutional ownership, bank size, inflation, interest rate and GDP.

Research limitations/implications: Missing data prevented the use of strongly balanced panel. The lack of flexibility with using quantitative approach did not allow further scrutiny of the nature of variables. However, statistical tests were acceptable for the model used. The study has implications for management and owners of banks to be wary of agency problem because that provides incentive for reckless high risk transactions that may benefit the agent than the principal. Management must engage in actions that profile the company better and enhances value maximization. Rising default risk has tendency to impair corporate image leading to loss of reputational capital.

Originality/value: The study provides the use of quantitative approach to measuring certain phenomena within the discipline of internal controls. The study adds to a previous study by same authors and confirming the agency problem in a different approach.

Key Words: Agency problem, Credit risk, Internal controls

JEL Codes: G21, G32

5.2 Introduction

Stakeholders in the financial system have revised their risk preferences, perceptions and consciousness after the global financial crisis. Much awareness, attention and concern have been shown in the operations of banks following lessons the global financial crisis in 2007 (Shin & Kim, 2015). Specifically, participants in the banking industry have demonstrated keen interest in the activities of banks especially their asset, liquidity and risk transformation functions. In the credit granting process, banks officials may exhibit opportunistic tendencies which could lead to the risk of default. Management at times exploit their informational economies to the disadvantage of the organization thus deepening the agency problem. The consequences of such misbehaviour could surface initially in the form of rising non-performing loans, financial distress, insolvency, bankruptcy and failure. The aggregate result of such unpleasant situations at the firm, country and international levels could bring about financial crisis globally. This is because investments could be lost at each point of these trajectory of difficulties banks go through. Bank systemic risks are interconnected and their effect extend beyond the industry to the domestic and international economies. The failure of a single financial institution creates failure in other parts of the financial system (Rötheli, 2010). The global financial crisis is a typical case in point. Within the financial services industry, there are many identifiable risks. Doerig (2003) stated that almost all activities of financial institutions have human interface thus exposing the institution to various human-related risks.

There have been several developments in the banking industry emanating from policies from the European Central Bank which have affected the demand and supply of credit within the region. Credit rationing of various forms have surfaced in the post-crisis era in

attempt to control the devastating effect of credit losses which occurred during the crisis (Balcerowicz, Rzoca, Kalina, & Łaszek, 2013). The writers report that the credit risk of companies increase whenever it becomes too risky to lend to government. This is exactly the situation in the European Union area because some countries are not attractive to seek credit from banks thus compelling the European Central Bank to put in place series of measures and monetary policies to hold them in check. Banks within the EU region are deleveraging than de-risking until between 2013 and 2014 which has seen upsurge in the total risk weighted assets (European Banking Authority Risk Assessment Report, 2015). There are some impeccable results being achieved in some portions of asset quality of banks within the region, some critical areas still need to be tightened to ensure full recovery from credit losses.

From the year 2009 -2014, the EBA Risk Assessment report reveal that impairments on financial assets to total operating income reduced from a weighted average of 26.6% to 17.5%. Other ratios like impaired loans and past due to total loans and advances and impaired financial assets to total assets saw marginal increases from 5.1 to 6.6 and 1.6 to 2.0 respectively from 2009-2014. Mesnard, Margerit, Power and Magnus (2016) reported that at the end of September 2015, the two countries which had to implement strict capital controls, Greece and Cyprus, reported NPL ratio of more than 40%. Bulgaria, Croatia, Hungary, Ireland, Italy, Portugal, and Romania all report gross NPL ratio between 10% and 20%. These developments makes it necessary to enforce measures to minimize credit risk exposure of banks of member countries. In a related post-crisis study in Europe, Caselli, Gatti and Querci (2016) were concerned about how bank capitalization decisions affect their risk behaviour. This study follows the same line but shows interest in how internal controls affect credit risk. It is always the goal of management to maximize its risk-adjusted rate of return by maintaining credit risk within acceptable limits or parameters. Apart from the traditional loan granting activity banks engage in some off-balance sheet transactions that increases their credit risk exposure. Regulatory approaches to credit risk management have not always been exhaustive in their use hence the need to enforce self-regulatory practices used by management. One of such managerial tools is internal controls.

Modern day firms find themselves in a dispensation where so much focus is on cooperative behaviour or relationship between the owners (principal) and management

(agent) to ensure maximization of firm value. This connotes that the two parties should share common goals to the extent that the individual personal interests are not significantly different between the principal and the agent. The rationality theory enshrines the probability of individuals exploiting their opportunistic tendencies by substituting the goals of the organization for their personal ones. The existence of partial rationality and cognitive limitations on the part of individuals call for systemic coordination of divergent visions and goals in order to establish congruence in the goals. Internal controls systems have been widely used by most organizations to bring the divergent goals of management and owners to a point of convergence. Most of the studies on bank credit risk focus on managing credit risk with various models rather than the use of internal control mechanisms. The work Building on earlier works on internal controls such as Olatunji (2009) and Lakis and Giriunas (2012) who focused on fraud, we provide a wider view of internal controls covering all the elements globally accepted and used like COSO and Basel Committee on Banking Supervision.

Bedard (2011) used the US SOX internal controls which focus on financial reporting. Using internal governance for internal controls, it was found that bank internal governance determined its performance and risk reduction (Dedu & Chitan, 2013). In a study on bank internal control weakness and loan loss provision (a measure of credit risk), it was found that banks with internal controls weakness but with sound policies reduced their loan loss provisions with time (Cho & Chung, 2016). Their study did not use the elements of internal controls even though a relationship between internal controls and credit risk was studied. This work is an extension of the study by Akwaa-Sekyi and Moreno (2016) whose work was limited to Spain and elements of internal controls in geographical and theoretical scopes respectively. This particular study extends the scope geographically to the European Union countries and theoretically covers the elements and objectives of internal controls using the revised COSO framework. The variables used in the model have all been quantitatively measured, a situation which is a deviation from the usual primary data approach to studying internal controls. The current study touches hardly-researched area in risk analysis and challenges the notion that internal controls is only seen to relate to operational risk and not credit risk.

Banks reduce their risk taking behaviour and are unlikely to experience failure if they comply with internal control mechanisms (Jin, Kanagaretnam, Lobo & Mathieu, 2013).

The paper examines the effectiveness of internal control systems, investigates whether evidence of the agency problem exist among banks within the European Union countries and establishes a relationship between internal controls and credit risk. The existence of the agency problem or otherwise will be confirmed. The study will go a long way to make new revelations and confirm or contrast previous research on the relationship between internal controls and credit risk. The structure and effectiveness of internal controls is evident in the reporting of banks and this is explored to unveil its relationship with credit risk. Thus the study reinforces prudence and cautiousness on the part of management even though the profit maximizing objective cannot be shirked in the process of discharging bank critical functions. This study explores hardly researched area in the use of quantitative variables to study an area which hitherto has been studied with the use of primary data. The rest of the paper covers literature review, hypotheses and variables, design/methodology/approach, findings and conclusion.

5.3 Literature Review

Individuals are limited by their cognitive abilities hence cannot act beyond their levels of cognition. Earlier research which believed in human relation theories discouraged the control of individuals. When individuals from various backgrounds with their differences find themselves in an organization, the need to ensure congruence of the various individual goals to the organizational goals call for a system that moderate lifestyles. The situation calls for controlling behaviour at a micro level (individuals) and then at a macro level (institution). Thus two contrasting but complementary theories provide foundations for this research. These are the agency theory (micro and individual level) and institutional theory (macro level of organizational behaviour). The agency theory is accredited to Jensen and Meckling (1976) and later by Fama and Jensen (1983). The core of the theory is the aligning of conflicting interests through separation of ownership from control within the organization. Jensen and Meckling explains the agency relationship as a contract where one party (principal) engages the services of another (agent) to perform a service on the former's behalf. The trade-off between incentives and risk sharing is confirmed by Hart (1995). The cost associated with possible conflict of interest between agents and principals are known as agency costs. A managerial tool put in place to check

management and employee misbehaviour through auditing, budgeting, compensation and other forms of control have proven successful in minimizing the agency costs.

According to Letza, Kirkbride, Sun and Small (2008), the argument underlying the agency theory is that, managers will only act to maximize shareholder value if only it is not in conflict with their own personal self-interest. The agency problem can be linked to bank credit risk instances. Bank managers in their effort to originate, fund, service and monitor credit supply may engage in certain actions or inactions that will impair the loan portfolio leading to the loss of assets. It is to avert such occurrences that effective internal control systems that minimize such losses should be in place and effectively enforced.

The institutional theory dates back in the 1970s. It is a complex view of the organization and how it responds to normative pressures from the internal and external environment that compels the organization to take legitimate stance to respond to such pressures. The theory is popular in economics, sociology and political studies (Lynne, 1987). Institutional theories emphasize standard systems and procedures for the conduct of business to ensure survival of the organization. Seeing individuals as actors and creatures of behaviour, they produce and influence social change whenever they come together (Meyer, 2006). Hence it is not enough to control behaviour in an individualistic approach (Jepperson & Meyer, 2007). Realist institutionalism believes that some fundamental institutional principles must be in place for organizations to function effectively. This is what we ascribe to, and propose internal controls as a key fundamental practice that all organizations especially banks must have in place and follow the provisions thereof. The study draws theoretical support from the agency and institutional theories maintaining that, if there are measures put in place to neutralize the entrenchment of managerial self-interest, control group behaviour at institutional level through effective internal control systems, credit risk could be minimized.

Stakeholders seem to have some level of confidence in firm transparency through reporting, accountability and reliable information which is enforced through effective internal control systems (Rittenberg & Schwieger, 2001). The Committee on Sponsoring Organizations (COSO) (1992) defines internal controls as the process affected by the entity's board of directors, management and other personnel designed to provide reasonable assurance regarding achievement of effectiveness and efficiency of

operations, reliable financial reporting and compliance with applicable laws and regulations. Cases of numerous corporate scandals compelled the US Congress passed a law which gave birth to the Sarbenes-Oxley Act 2002. This law was seen as an improvement upon the COSO framework thus giving emphasis to monitoring and reporting. It is therefore not surprising to find most internal control research directed towards financial reporting. The SOX Act requires that management reports material internal control weakness to the board and external auditors. The adequacy of internal control systems and the attestation by independent auditors on the report by management is provided in the Act.

Basel Committee on Banking Supervision (2012) defined internal controls as ensuring that senior management establishes and maintains an adequate and effective internal control system and processes. The systems and processes should be designed to provide assurance in areas including reporting (financial and operational), monitoring compliance with laws, regulations and internal policies, efficiency and effectiveness of operations and safeguarding of assets. After an extensive theoretical study of internal controls, (Lakis & Giriunas, 2012) defined internal controls as that part of enterprise management system ensuring the implementation of goals, effective economic-commercial performance of the enterprise, observation of accounting principles and effective control of work risks that enables the organization minimize the number of intentional and unintentional mistakes, to avoid frauds in the process of enterprise performance made by authority or employees. Their definition emphasizes effective risk management just as the Basel Committee on Banking Supervision definition.

International Auditing Standards define internal control as a drafted process implemented by people in governance, management and other persons in authority in order to give reasonable assurance that objectives of the organization regarding credible financial reporting, efficiency and efficacy of operations and are in compliance with existing laws and regulations (Briciu, Dănescu, Dănescu, & Prozan, 2014). The definition focuses on the micro level of viewing the organization and limits the definition to control of the individuals within the organization. Internal control is a managerial tool which covers all set of daily activities in all areas of the organization, at all levels towards safeguarding the assets, ensuring compliance and transparency, communicating material weakness,

protecting stakeholder interest in order to achieve the long-term goals of the organizational (Akwaa-Sekyi & Moreno, 2016).

The business environment is dynamic hence changes, reviews and reengineering in policies to reflect the changing trends are necessary. It is for no reason that the COSO framework for internal controls has been revised in the year 2013 which pays attention to some of the SOX Act provisions. The new framework which was represented in a cubic shape covers the five elements (control environment, risk assessment, control activities, information and communication and monitoring), the objectives (operations, reporting and compliance) and level (entity, division, operating unit and function)(McNally, 2013). The revised framework identifies seventeen principles under the five broad elements. This new framework is a combination of the SOX provision of communicating material internal control weakness. The other dimension of internal controls in the revised framework is the objectives. The three objectives of internal control systems are performance and operational, reporting and compliance objectives (McNally, 2013). The last dimension of internal control system is the level at which the control systems are being applied or enforced.

Generally, internal controls minimizes the loss of revenues, wastage of resources and unanticipated losses (Abbas & Iqbal, 2012). Internal controls reduces information asymmetry, promote best practices in transparency and protect shareholders against the power of rulers (Salhi & Boujelbene, 2012). The observation of sound and effective internal controls is a major driver to investor confidence and earns the institution significant amount of reputational capital. Jim, Kanagoretam and Lobo (2013) found that banks without proper internal controls could grow temporarily but they have higher likelihood of failing in the near future. This defeats the going concern concept of organizations of which banks are no exception. When banks fail, there is a greater disincentive to depositors, investors and the externalities on other banks.

What constitute internal control effectiveness are measured in terms of the efficiency and effectiveness of activities, reliability of information and compliance with laws and regulations (Jokipii, 2006). It is only when the objectives of internal control mechanisms are achieved that one can be sure of its effectiveness. If internal controls are unable to ensure operational efficiencies, report appropriately to internal and external stakeholders

and comply with regulatory demands, it cannot be said to be effective. Internal control systems were developed by the Basel Committee on Banking Supervision to ensure prudence and stability in the financial system. Anecdotal evidence from numerous bank failures and even the quite recent financial crisis gives support to the fact that credit is a major contributory factor to these failures (Doerig, 2003). There is the human element of the credit granting process and that is what internal controls seek to ameliorate.

Banks benefit from transforming their liabilities into assets thus an incentive for optimal risk benefit behaviour is pursued but bank managers owe their principals a duty of care (fiduciary relationship). Moral hazards and adverse selection emanates from the exploitation of informational economies by counter parties and can best be minimized if management is extra careful in its asset creation function. Ellul & Yerramilli (2013) reported that financial institutions with strong internal risk controls are able to survive financial crises and refute the claim that the financial crisis did not affect all institutions the same way as speculated by some experts in finance. It is not uncommon to find bank managers over-ambitiously creating very risky assets (credit facilities) in the name of higher return expectation. It is not to say that lack of effective internal control measures is the sole cause of credit risk but there are many avoidable factors which can be eliminated through strict enforcement of internal control systems among banks.

5.4 Hypotheses and variables

The explanatory variables for the study have been classified under internal control elements, objectives, agency problem, bank-specific and country specific variables. These classifications are meant to holistically deal with all the objectives of the study. The outcome variable of interest to this study is credit risk.

5.4.1 Dependent variable

The dependent variable for the study is credit risk.

Credit risk

Banks for International Settlement (BIS) provide a set of principles to enable banks manage credit risk. The areas covered in the set of principles include establishing

appropriate credit risk environment; operating under a sound credit granting process; maintaining an appropriate credit administration, measurement and monitoring process; and ensuring adequate controls over credit risk. These principles have semblance with the elements of internal controls which comprises control environment, risk assessment, control activities, information and communication and monitoring. There are overlaps in ensuring that principles of credit risk management and internal control practices are fully implemented by bank management. Credit risk has been identified as the major deficiency to bank management and among the three major risks facing banks (Al-Tamimi & Al-Mazrooei, 2007; Maltritz & Molchanov, 2014). Credit risk is defined as the likelihood that a borrower or counter party will default in the conditions of a loan agreement, contract or indenture either in part or in full (Sobehart & Keenan, 2001). Banks stand to enjoy benefits of enjoying reputation capital, attracting more investments and being more profitable if they take credit risk management very serious.

Banks have had unpleasant experiences with rising default rates and impairment to entire loan portfolio (Fukuda et al., 2009). The writers reported of the warning from the Japanese government on the need for banks to reduce non-performing loans since it has seriously affected the financial health of the banking industry. In the Spanish banking industry, it was found that lenient credit terms among other factors determines non-performing loans (Saurina & Jimenez, 2006). The cases of rapid credit expansion and lenient credit terms are traceable to weak internal control structures. The reputation of banks is impaired by credit risk and translate into other risks especially in situations where internal governance mechanisms are very weak (Mamiza Haq et al., 2014). It is not for no reason that the European Central Bank has put in place series policies and regulatory mechanisms to keep credit risk very minimal among member countries. This makes credit risk an important issue for banks to deal with and we therefore use it as the dependent (outcome) variable around which internal controls and other bank specific factors revolve. From the discussions above, we conjecture a relationship between internal controls and credit risk and therefore hypothesize that:

H₁: Internal controls significantly reduce credit risk

5.4.2 Elements of internal controls

The elements of internal controls are control environment, risk assessment, control activities, information and communication and monitoring.

5.4.2.1 Control environment

The control environment sets the tone to control the consciousness of people within the organization to adhere to best practice, be ethical in the conduct of business and operate within the confines of rules (Coca-Cola Amatil, 2011). This element of internal controls cover demonstration of commitment to integrity and ethical values, exercising oversight responsibilities, establishing structures, authority and responsibility, demonstrating commitment to competence and enforcing accountability. We measure the control environment by board size. It was reported that board characteristics improves upon enforcement of internal control mechanisms and helps reduce firm risk behaviour (Ahmad, Abdullah, Jamel, & Omar, 2015). Board size influences the effectiveness of supervisory board or senior management with mixed report in favour of large board size (Chen & Al-Najjar, 2012) and others against large board size (Uwuigbe & Fakile, 2012). We hypothesize that:

H₂: Control environment minimizes credit risk among banks

5.4.2.2 Risk assessment

Under risk management, companies should specify suitable objectives, identify and analyse risks, assess fraud risk and identify and analyse significant change. Organizations must be familiar with the very risks that hinders it from achieving its objectives (Abbas & Iqbal, 2012). The expertise and experience of management and board members and their ability to identify, measure, monitor and evaluate risks goes a long way to reduce the consequences of bank risks. It was found that risk assessment significantly affected credit risk among banks in Spain (Akwaa-Sekyi & Moreno, 2016). We measure risk assessment by the ratio of risk weighted assets to total assets and hypothesize that:

H₃: Risk assessment reduces credit risk

5.4.2.3 Control activities

The control activities comprise selecting and developing control activities in general and over technology and deploying policies and procedures. It concerns taking precautionary measures and determining acceptable risk tolerance levels through policies, checks and balances (Abbas & Iqbal, 2012). Bank control activities was found to significantly minimize credit risk (Akwaa-Sekyi & Moreno, 2016). We measure control activities by staggered board which is a policy to minimize the dilution of board composition and hypothesize that:

H₄: Control activities has significant negative effect on credit risk

5.4.2.4 Information and communication

The next internal control element is information and communication and this covers the use of relevant information and communicating internally (to functional areas) and externally (stakeholders) through various reports (Abbas & Iqbal, 2012). Banks earn reputational capital when they are able to provide reliable timely information to internal and external stakeholders (Y. Zhang et al., 2007). We measure this variable with how prompt company annual reports are released. We hypothesize that:

H₅: Information and communication significantly affects bank credit risk

5.4.2.5 Monitoring

Monitoring is about conducting on-going and/or separate evaluations and evaluating and communicating deficiencies (McNally, 2013). It is expected that management and board demonstrate capacity to ensure that internal control systems are followed. The managerial tool used to monitor the organization is the reporting of material internal control weakness (Basel Committee on Banking Supervision, 2010). We measure monitoring with bank's ability to report material internal control weakness and hypothesize that:

H₆: Monitoring significantly reduce bank credit risk

5.4.3 Objectives of internal controls

The objectives of internal controls are efficiency and operational performance, reporting and compliance objectives. Internal control systems have objectives of ensuring higher performance through sustainable levels of profitability (McNally, 2013). The achievement of performance, reporting and compliance objectives is an indication of effective internal control systems. Managerial efficiency is seen in their ability to manage cost in proportion to income and it is the only way the firm can survive and be sustainable. Within the European Union, it was reported that profitability, capitalization, efficiency and liquidity are inversely and significantly related to bank risk (Balcerowicz et al., 2013).

We measure the objectives of internal controls by cost to income ratio, return on risk weighted assets and loan to deposit ratio. Return on risk weighted assets reflect how bank returns are changed through the economic cycle (Papa, 2015). He reports a declining return on risk weighted assets in the European Union between 2005 and 2012 which he attributes to the region's shift from Basel I to Basel II requirements. In other studies, return on risk weighted assets is said to be the single most reliable measure of bank performance (Sinn, D'Acunto, & Oldrini, 2013). The desire for higher returns and profitability have incentives for engaging in risky transactions and hence increase bank credit risk whilst efforts to ensure compliance with regulations, internal laws and limits turn to reduce credit risk (Akwaa-Sekyi & Moreno, 2016). We make three hypotheses on the objectives of bank internal control systems:

H₇: Return on risk weighted assets significantly increase bank credit risk

H₈: Performance objective increases bank credit risk

H₉: Compliance objectives reduces bank credit risk

5.4.4 Agency problem

The agency problem is the conflict of interest between the principal (owners) and agent (management). It is the bedrock for the institution of internal control systems. Better investor protection measures like institutional ownership and insider ownership may lead to taking riskier but value maximizing decisions in the firm (John, Litov, & Yeung, 2008).

Banks engage in further actions to align the divergent interests of management and shareholders (Lee Weon, 2011). Lee provide further evidence that insider ownership does not only reduce risk taking behaviour but also increases the value of the firm. This they do by having insider ownership so that management will be motivated to profile the company in an enviable way and safeguard the assets of the company (Goncharov, Zimmermann & Jochen Werner, 2006). Where there is insider ownership, it is supposed to be inversely correlated to credit risk. Usually when there are institutional owners, the extent of corporate practice, adherence to rules and regulations, ethical behaviour is higher than when there are no institutional owners. Ellul and Yerramilli (2011) did not find institutional ownership to significantly affect bank internal risk control but García-Marco and Robles-Fernández (2008) found otherwise. We measure agency problem by the percentage of institutional and insider ownership and state two hypotheses that:

H₁₀: Institutional ownership inversely relate to credit risk

H₁₁: Insider ownership reduces bank credit risk

H₁₂: There is no agency problem among banks in the European Union.

5.4.5 Bank-specific factors

Banks have certain characteristics that makes them unique among others in the industry. These unique characteristics determine their exposure to risks and its attendant consequences (Haq, 2010). In his study of fifteen European countries, Haq found that bank characteristics significantly determined their risks especially equity risk and credit risk. In this study, the bank characteristics considered are bank size and bank age. Larger banks have the potential to absorb the shocks of credit risk better than smaller banks. It was reported that larger banks have better internal control systems (Laeven & Levine, 2009), variety of credit products for its clients (Eling & Marek, 2009) whilst smaller firms do not have incentive to improve upon internal control mechanisms (Ashbaugh-Skaife et al., 2007). It is the same with the age of the bank. Banks that have been in operation for long might engage in some activities that will minimize or increase the effect of credit risk. Experience in the business terrain insulates them from certain risks which new entrants may hardly escape. Banks that have long years of existence have lesser signs of

material internal control weakness than new ones (Tang et al., 2014). We therefore hypothesize that:

H₁₃: Bank-specific factors significantly reduce credit risk

5.4.6 Country-specific variables

There are country-specific characteristics that affect bank credit risk. Inflation, interest rate and GDP are major factors that affect the demand and supply of credit in the financial system. The gross domestic product of a country has relationship with demand and supply of credit and its attendant risk. It was reported by Darvas, Pisani-Ferry and Wolff (2013) that when credit becomes expensive or decline in supply, it stifles the growth of a country's GDP. There are other views that when a crisis is preceded by a boom in the credit industry, there is almost no correlation between bank credit and recovery of economies (Takáts & Upper, 2013). It was reported that macro-economic factors had significant relation with credit risk of a country (Jakub, 2007).

H₁₄: Gross Domestic Product of a country affect credit risk

H₁₅: Rate of inflation in a country affect credit risk

H₁₆: Interest rates in a country affect credit risk

5.5 Design/Methodology/Approach

The study design is purely a quantitative approach to establish the relationship between internal controls and operational risk. The statement and statistical test of hypotheses makes our study a deductive approach. Secondary data was obtained from Bankscope, SNL Financials, World Bank Reports, country central bank reports and bank annual and corporate governance reports for 91 banks from 23 countries from the period 2008-2014. Although the data is not a perfectly balanced panel due to data unavailability for some banks in some years for some variables, the data passed reliability and robustness tests thus making the results very reliable. Again, the correlation matrix does not show multicollinearity because the independent variables weakly correlated among themselves.

We perform robustness checks in order to deal with heteroskedasticity. Reliability of information and communication was a constant term because all the banks were prompt with the release of their annual reports and other communications.

5.6 Empirical models

We propose a general equation for the study that credit risk is a function of internal controls. For panel data analysis, the generalized least squares regression using random or fixed effect model, a general equation that encompasses individual and time-specific effects is proposed. Bank heterogeneity is accounted for by fixed or random effects. Fixed effect models account for time-invariant omitted variables that can affect the dependent variable with the assumption that individual entity (bank) error term correlates with the predictor variables (Torres-Reyna, 2007). The sample of 91 different banks from 23 countries have different unique characteristics such as national and firm policies, severity of impact of global financial crisis, macroeconomic policies and investor protection policies to minimize agency costs.

However, fixed effects of time-invariant variables can only be controlled but their coefficients cannot be estimated with fixed effect. Time-invariant characteristics of entities are perfectly collinear with entity's dummies. If individual error terms are correlated, then fixed effect model might not be appropriate but random effect. Random effect model assumes that the variation across entities is random and uncorrelated with the predictors (Green, 2008). Random effect models assume that differences across entities may affect the dependent and allows for the inclusion of time-invariant variables in the model. The controversy over choice is resolved by running a Hausman test to confirm which model is appropriate. This equation is further decomposed to arrive at the overall model that contains all the independent and control variables using their proxies. From equation (1)

$CR_{ikt} = \alpha_{0ikt} + \beta_1 \lambda_{ikt} + \Phi_2 \lambda_{ikt} + \lambda_3 \lambda_{ikt} + \psi_4 \lambda_{ikt} + \varepsilon$	(1)
--	-----

where $\alpha, \beta, \Phi, \lambda, \psi$ = parameters for the constant, internal control elements and objectives, agency problem, bank-specific factors and country-specific characteristics respectively

$CR_{ikt} = \alpha_{0ikt} + \beta_{1ikt}IntCont + \Phi_{2ikt}Agency + \lambda_{3ikt}BankXtics + \psi_{4ikt}CountXtis + \varepsilon$	(2)
$IntCont = f(contEnvt, RiskAss, ContAct, InfComm, Monit, OpPerf, Compl)$	(2.1)
$Agency\ problem = f(instiOwn, InsidOwn)$	(2.2)
$Bank\ characteristics = f(Bank\ Size, Bank\ Age)$	(2.3)
$Country\ characteristics = f(Inflation, Interest\ rate, GDP)$	(2.3)

We superimpose all the variables into a general equation

$CR_{ikt} = \alpha_{0ikt} + \beta_{1ikt}ContEnvt + \beta_{2ikt}RiskAss + \beta_{3ikt}ContAct + \beta_{4ikt}InfComm + \beta_{5ikt}Monit + \beta_{6ikt}OpPerf + \beta_{7ikt}Compl + \Phi_{1ikt}instiOwn + \Phi_{2ikt}InsidOwn + \lambda_{1ikt}BankSize + \lambda_{2ikt}BankAge + \psi_{1ikt}Inflation + \psi_{2ikt}Interstrate + \psi_{3ikt}GDP + \varepsilon$	(3)
--	-----

where CR_{ikt} = credit risk for bank 'i', from country 'k' at time period 't'

the subscripts **i** denotes banks (**i= 1,2,3,4..... 91**), **k** represent country (**1,2,3,4...23**), **t** represent time period (**t= 2008, 2009, 2010.... 2014**) $\alpha, \beta, \Phi, \lambda, \psi$ are the parameters to be estimated (explained above) and ε represent the idiosyncratic error term.

Table 5.1: Variables description and measurement

Category	Variables	Proxy variables	Expected sign
Dependent variable	Credit risk	Non-Performing Loans/Total Loans	
Independent variables			
<i>Internal elements</i>	<i>control</i>		
	Control environment	Board size measured by number of board members	-
	Risk assessment	Risk Weighted Assets/Total Assets as reported by SNL Financials	-
	Control activities	Staggered board= dummy (1) if a bank has staggered and (0) if it has not	-
	Information and communication	Timeliness of financial information and adherence to international standards	-
	Monitoring	Reporting material internal control weakness= dummy (1) if a bank reported material	-

		internal controls and (0) if they did not	
<i>Internal objectives</i>	Operational performance	Return on average risk weighted assets as reported by SNL Financials	+
	Managerial efficiency	Cost/Income ratio	+
	Compliance	Loans to deposit ratio	-
<i>Agency problem</i>	Institutional ownership	Percentage of institutional owners	-
	Insider ownership	Percentage of insider owners	-
<i>Bank characteristics</i>	Bank size	Logarithm of total assets	+/-
	Bank age	Number of years in business	+/-
<i>Country characteristics</i>	Inflation	Country reported figure	+/-
	Interest rate	Country reported figure	+/-
	GDP	Country reported figure	+/-

Table 5.2: Sampled countries

Country	Frequency	Percent
Austria	8	1.5
Greece	35	6.4
Hungary	14	2.6
Ireland	7	1.3
Italy	105	19.2
Macedonia	7	1.3
Malta	7	1.3
Netherlands	7	1.3
Poland	63	11.5
Portugal	14	2.6

Romania	14	2.6
Bulgaria	6	1.1
Slovakia	6	1.1
Spain	46	8.4
Sweden	12	2.2
UK	23	4.2
Croatia	14	2.6
Cyprus	12	2.2
Czech	7	1.3
Denmark	84	15.4
Finland	12	2.2
France	22	4.0
Germany	20	3.7
Total	546	100.0

5.7 Descriptive statistics

The mean non-performing loans for the countries about 10.4% which is comparatively reducing, even though Mesnard, Margerit, Power and Magnus (2016) have reported huge figures for some individual countries in Europe. The standard deviation and errors shows relatively smaller variability apart from cost/income (23.6%) institutional ownership (23.9%) and risk weighted assets to total assets (20.5%), the dataset on credit risk is peaked around the mean. It could generally be seen from the dataset that apart from dummy variables, other metric variables show consistency between the two central tendencies (mean and median). Banks within the region have better investor protection mechanisms through institutional ownership (23.1%), insider ownership (1.2%) and also report material internal control weakness. There is relatively about 1% return on average risk weighted which was reported by (Papa, 2015) as the true measure of bank performance.

Table 5.3: Descriptive statistics

variable	mean	sd	skewness	p50	se(mean)
npltotlns	.1040574	.1182512	2.557788	.0643212	.0050653
lnassets	17.14862	2.243848	-.097068	17	.0961159
retonavrwa	.0913945	3.498769	-4.068971	.56	.1498708
costincome	62.8271	23.62745	3.600408	60.53	1.012089
rwaassets	57.75028	20.45898	.0953036	58.62	.8763664
insiderown	1.216881	5.952638	6.193854	0	.254983
instituwown	23.10998	23.90675	1.25429	17.46	1.026883
staggbod	.2697248	.4442245	1.037704	0	.0190285
bodsize	12.48059	5.198833	.5158252	12	.2235153
repointco-r	1.025735	.4886176	.0629172	1	.0209493
lnbnkage	4.07705	1.231731	-.8439257	4.510859	.0527616
inflation	2.092517	1.651676	.6638115	2.085357	.07075
interestrate	3.212263	3.065807	1.289607	2.489167	.1319313
gdp	-.1532955	2.792719	-.6504892	.2795653	.1197369

5.8 Findings

In order to decide on which estimation model to choose between fixed or random effect, Hausman test was run. This specification test basically tests whether unique errors are correlated with the regressors, with the null hypothesis saying they are not (Green, 2008). The test pre-sets a null hypothesis that random effect is preferred over the alternative fixed effect and the criteria is a rejection of the null hypothesis if the probability value is less than the set confidence interval.

The hypothesis predicts that random effect is same as fixed effect. To perform the test, fixed effect model is run where the dependent variable (credit risk measured by npl/total loans) is regressed over the set of internal control elements, objectives, agency problem, bank and country characteristics. The result is stored and the random effect model is also run. Hausman specification test is run over fixed and random and the result will which model is appropriate. It can be seen from the result that the test is significant at 1% confidence interval ($p=0.0000$). This means that we reject the null hypothesis that unique errors are not correlated with the regressors. The result suggest a choice of fixed effect over random effect since the test that the difference in coefficients are not systematic is rejected.

Table 5.4: Hausman specification test results

. hausman fixed random

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
lnassets	-.0308062	-.0163707	-.0144354	.0122007
retonavrwa	-.0045774	-.0063118	.0017344	.
costincome	.0002491	.0000367	.0002124	.
rwaassets	-.0017965	.0000519	-.0018484	.0002851
instituwown	.0014951	-.0005545	.0020496	.0012897
bodsize	-.0017997	-.0025021	.0007024	.0015342
reponintco~r	-.0128986	.0113266	-.0242252	.0411768
lnbnkage	.0286635	-.0032921	.0319556	.0187622
inflation	-.0174204	-.0195175	.0020971	.
interestrates	-.0068347	.0006575	-.0074922	.001244
gdp	.0032943	.0030867	.0002076	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(11) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
 = 102.47
 Prob>chi2 = 0.0000
 (V_b-V_B is not positive definite)

The result of the test suggest that fixed effect model will be better than random effect. There are upcoming works that have challenged the Hausman specification test claiming its biasness towards to fixed effect (Bell & Jones, 2015) claiming that what fixed effect can do, random effect can even do better. We seem to agree with such school of thought to some extent. This is because the random effect gives better prediction power and significant levels for key variables of interest in our case but the Hausman test suggest otherwise. Rejecting the use of random effect for fixed effect seem to us like throwing away the water in the pan with the baby.

We control for heterogeneity with fixed effect model by running a robustness check on the standard errors. The result of the fixed effect regression can be found in Table 5.5. There were 91 banks with 534 observations with average observation per group of 5.9 in the panel. The robust fixed effect model omits two variables (insider ownership and staggered boards). The errors are correlated with the regressors (-0.5933). The F-test shows whether all the coefficients in the model are different from zero. It could be seen

from the significance level (0.000) that the coefficients are different from zero thus confirming a good model.

Table 5.5: Robust GLS fixed effect regression results

```

note: insiderown omitted because of collinearity
note: staggbod omitted because of collinearity

Fixed-effects (within) regression              Number of obs   =    534
Group variable: bankcode                      Number of groups =    91

R-sq:  within = 0.3037                        Obs per group:  min =    1
        between = 0.0069                       avg =    5.9
        overall = 0.0064                       max =    8

corr(u_i, Xb) = -0.5933                       F(11,90)        =    6.89
                                                Prob > F         =    0.0000

                                (Std. Err. adjusted for 91 clusters in bankcode)

```

npltotlns	Robust					[95% Conf. Interval]	
	Coef.	Std. Err.	t	P> t			
lnassets	-.0308062	.0150238	-2.05	0.043	-.0606536	-.0009587	
retonavrwa	-.0045774	.0014022	-3.26	0.002	-.0073631	-.0017918	
costincome	.0002491	.0001876	1.33	0.188	-.0001236	.0006219	
rwaassets	-.0017965	.0007869	-2.28	0.025	-.0033598	-.0002332	
insiderown	0	(omitted)					
instituwown	.0014951	.0004687	3.19	0.002	.0005639	.0024262	
staggbod	0	(omitted)					
bodsize	-.0017997	.0023415	-0.77	0.444	-.0064515	.0028522	
reponintcontr	-.0128986	.0094975	-1.36	0.178	-.0317669	.0059698	
lnbnkage	.0286635	.0188954	1.52	0.133	-.0088755	.0662025	
inflation	-.0174204	.0039781	-4.38	0.000	-.0253235	-.0095172	
interestrate	-.0068347	.0034796	-1.96	0.053	-.0137475	.000078	
gdp	.0032943	.0013937	2.36	0.020	.0005256	.0060631	
_cons	.664605	.2809101	2.37	0.020	.1065281	1.222682	
sigma_u	.12354209						
sigma_e	.06337491						
rho	.79167107	(fraction of variance due to u_i)					

The intra-class correlation measured by ‘rho’ suggest that 79.2% of the variance is due to differences across panels. The ‘t-value’ test the hypothesis that each coefficient is different from zero and this hypothesis is rejected when the t-value is higher than 1.96 for 95% confidence interval. It is only in this case that the variable can be said to be significant and important in explaining the dependent variable. This means, the higher the t-value, the better for that particular variable. It could be seen from the result that each of the category of variables in the model significantly affect credit risk. The internal control elements, internal control objectives, agency problem, bank characteristics and country characteristics all have significant effect on credit risk. The internal control element, risk assessment is significance (0.025) and negatively affect credit risk even though the correlation is weak. The result confirms earlier research that good risk assessment reduces

risk exposure (Abbas & Iqbal, 2012) but contrary to an earlier study by Akwaa-Sekyi and Moreno (2016) who rather found a positive correlation.

The effectiveness of internal controls is determined by its ability to achieve the objectives. It is found from the study that operational performance objectives of internal controls is significant but inversely related to credit risk which is contrary to our hypothesis. The result is rather in tandem with the claim that profitability and efficiency is inversely related to bank risks (Balcerowicz et al., 2013). Institutional ownership shows high significance to credit risk. It is rather interesting to find that it is positively related to credit risk. It was expected that a significant negative relation exists between agency problem variables and the dependent variable. The result is not different from the situation in Spain when it was found that good board characteristics could not reduce credit risk of banks (Akwaa-Sekyi & Moreno, 2016). The hypothesis that there is no agency problem among banks in Europe cannot sustained. Bank characteristics shows significant negative effect on credit. Measured by bank size, the result shows that larger banks are able to minimize credit risk than smaller banks. The result confirms previous research that bank size significantly reduce bank risk taking behaviour (Haq, 2010).

Again, the report that smaller banks have disincentive to enforce internal control mechanisms (Ashbaugh-Skaife et al., 2007) as compared to larger ones is confirmed. All the country-specific variables showed significant negative relation with credit risk apart from GDP which was positive. There is reason to agree that macroeconomic environment has significant relation with credit risk within a country (Jakub, 2007). The explanatory power of the model provides better results for the within than the overall. The model shows that 30.4% of changes in a bank's credit risk is explained by internal controls. Interesting, the results for between and overall explanatory power of the model is about 1%. This is not strange in regression results and does not suggest the model is not good because necessary assumptions and tests have suggested suitability of the model.

5.9 Conclusions

It can be concluded from the study that there are effective internal control systems among banks in Europe because the objectives of operational performance and compliance are

achieved. Normally, when internal controls are effective, there should be no evidence of the agency problem. Contrary to this, there is the agency problem existing among banks in Europe and this support our earlier finding about banks in Spain. The study provides no guarantee for effective internal control systems as panacea to the absence of agency problem. There seem to suggest more and subtle conflict of interest among banks within Europe. Significantly, internal control elements, objectives, agency problem, bank and country characteristics affect credit risk. The revised COSO framework for internal controls provides a comprehensive approach to dealing with loss of assets. It is however not exhaustive but could be complemented with specific approaches to minimizing the agency problem. The inclusion of the agency problem in this model gives credence to our assertion. The study has implications for managerial and shareholder decisions regarding how to safeguard assets of banks. The social cost of loss of investments through credit risk and the possible of businesses is worth knowing.

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CHAPTER SIX

HOW DOES BOARD CHARACTERISTICS AND INSIDER OWNERSHIP AFFECT NON-PERFORMING LOANS (NPLs) IN EUROPEAN BANKING?

6.1 Abstract

Manuscript type: Empirical

Research question/issue: The state of non-performing loans (NPLs) poses serious threat to the European financial market and this has increased pressure on board of directors to intensify their monitoring functions to safeguard shareholder assets. Yet there is a dearth of research that complement board characteristics with managerial incentives to address NPLs. We examine 102 banks from 22 European countries to ascertain how board characteristics and insider ownership affect NPLs.

Research findings/insight: We find that whilst gender diversity, board size and insider ownership have negative relation with NPLs, average board age and board tenure show positive relation. The inclusion of insider ownership improves the significance of board characteristics therefore confirming a complementary instead of substitutable approaches in addressing NPLs. We report significant differences in the intrinsic board characteristics of diversified and non-diversified banks.

Theoretical/academic implications: We contribute to existing literature by providing empirical support for the stakeholder and agency theories in safeguarding assets of shareholders and indirect stakeholders (society).

Practitioner/policy implications: Our study adopts an incentivizing approach to risk management and provides a framework for dealing with moral hazards in bank management, which lead to loan losses. Again, our findings justify the European Banking Authority's policy of the mandatory 40% female independent directors among member countries.

Key words: Board Characteristics, Corporate Governance, European Banking, Insider Ownership, Non-Performing Loans

6.2 Introduction

The focus of this study is to answer the question of how board characteristics and insider ownership affect non-performing loans (NPLs forthwith) in European banking. The global financial crisis negatively affected public confidence in the financial services industry (especially banks). It is believed that poor governance among other factors were latent or significant causes of the 2007 crisis (Gualandri, Stanziiale, & Mangone, 2011; Gualandri, 2011; Andres & Vallelado, 2008; Kirkpatrick, 2009; Laeven, 2013). In the opinion of these authors, the exercise of powers over banks has fallen below expectation and has exacerbated bank risk exposure. The only way to restore trust and confidence in a financial system is through corporate governance (Farber, 2005) which uses board of directors as a major operational channel. Bank risk consciousness has increased in recent times which has deepened the pressure on board of directors in their monitoring and control functions on key bank activities (Bebchuk, Cohen, & Spamann, 2010; Muller-Kahle & Lewellyn, 2011; Srivastav & Hagendorff, 2016). The situation is very much mentioned in Europe as can be seen from the European Central Bank's assiduous efforts to address risk issues through various directives and structures within the financial system. A study of this nature in Europe is eminent because European banks are reported to contribute more to global systemic risk due to poor loan portfolios and their interconnectedness to the rest of the global financial system (Bostandzic & Weiß, 2013).

Globalization has made financial markets more liquid and large (Europe not exception) with complex market participants, risks and governance mechanisms. Banks exist to provide financial intermediation functions, which help to smoothen consumption through the supply of credit (Casu, Girdorne, & Molyneax, 2015). One key function of bank management which, is also a major source of shareholder income, is the generation of assets through loans. The state of NPLs has been reported as posing a threat to major financial markets like Europe (Barisitz, 2013; Erdinç & Abazi, 2014; KPMG, 2017), China (D. Zhang, Cai, Dickinson, & Kutan, 2016) and the US (Ghosh, 2015). Such loan losses impair shareholder value thereby increasing agency costs (Kanagaretnam, Lobo, & Mathieu, 2003). The agency problem existing between shareholders and managers are addressed through corporate governance strategies such as hostile takeovers where the agent lose their jobs, internal mechanisms through stock ownership options or through close monitoring by independent board members (Kaymak & Bektas, 2008). This study

takes a holistic approach by combining the interest-aligning and close monitoring mechanisms of addressing this long-standing conflict which has been a threat to the global financial environment. The board of directors owe it a duty to minimize information asymmetry and possible losses for ordinary shareholders whose interest they first represent (Bhagat & Bolton, 2007; Fama & Jensen, 1983) and also other stakeholders (Zagorchev & Gao, 2015); but in the case of alarming trends in NPLs (such as reported in Europe), there seem to be a perception of ineffective monitoring on the part of the board. Some factors which contribute to high non-performing loans stem from ineffective functioning of the board of directors and poor managerial incentives (Faleye & Krishnan, 2017; Mamatzakis, Zhang, & Wang, 2017). This paper takes up the challenge by investigating how board characteristics and insider ownership affect NPLs in European banking.

There are international issues regarding board governance which mirror national institutional settings and capital market development (Aguilera, 2005). These trans-national influences are major input in developing various governance frameworks such as board composition, structures and functions. Among international issues that affect board structure and functions are rule of law, investor protection and financial market laws which act as complements or substitutes to board governance especially as wealth protectors or creators (Kim & Ozdemir, 2014). European corporate governance system has board structures which are unitary, two-tier (management and supervisory boards) or both (Farag & Mallin, 2017; Hopt & Leyens, 2004). For instance, in Germany, France and Netherlands, it is a requirement for listed firms to operate two-tier boards.

The characteristics of boards determine the expected performance and their effectiveness (Pablo de Andres, Azofra, & Lopez, 2005; Desender, Aguilera, Crespi, & Garcíá-cestona, 2013; Zona & Zattoni, 2007) and how a board is composed determines its function and effectiveness (Sur, Lvina, & Magnan, 2013). Zona and Zattoni (2007) studied Italian firms and reported that board demographic variables determine three performance dimensions namely service, monitoring and networking. It was reported that board characteristics impacted on board decision processes with negative effects for risk management decisions (Lewellyn & Muller-Kahle, 2012; Muller-Kahle & Lewellyn, 2011) but the focus of this paper is NPLs which is a by-product of loan generation. In the work of Desender et al. (2013), it was established that firm ownership influences the

monitoring function of boards. However, the proxy variables for board of directors were board independence and CEO duality and this is one area where we differ by providing an extended and comprehensive view of board of directors by looking at the intrinsic and extrinsic characteristics. Desender et al. (2013) used concentrated and dispersed ownership whilst we use insider ownership as complementary to board characteristics. Existing studies have not thoroughly and conclusively established how the characteristics of board of directors affect the outcome of loans (a key function of banks) in European banking. This gap needs to be addressed, thus the focus of this study.

Opportunistic management behaviour (agency problem) is minimized through insider or managerial ownership (Coles, Daniel, & Naveen, 2006; Lafond & Roychowdhury, 2008). These moral hazards are exhibited by managers in credit creation, loan loss provision and non-performing loans reporting (Moro & Fink, 2013; D. Zhang et al., 2016) and also found to be a determinant of non-performing loans (Louzis et al., 2012). We conjecture that insider ownership will complement effective board monitoring to check some reckless behaviour of the agent which leads to the loss of assets through non-performing loans. However, there is little to show in a single study that delves into the relationship between board characteristics and insider ownership on bank non-performing loans (credit risk) from a cross-country perspective in Europe. In fulfilling their corporate governance responsibilities, board of directors play key roles in strategic decision making, monitoring executives/management and ensuring full disclosure and reporting (Petrovic, 2008). This paper emphasises the board monitoring function aspect of corporate governance and interest-alignment mechanism of the agent and the principal to address a market failure in European banking. We posit that **insider ownership improves board risk monitoring function than otherwise. The study therefore tests two models where insider ownership is included and another where it is dropped.** Bank insider ownership and intrinsic and extrinsic characteristics of board of directors should maximize shareholder value by reducing loan losses.

The study draws motivation from the works of Hagendorff, Collins, and Keasey (2010) and Sur, Lvina, and Magnan (2013) who propose complementary approaches to research on board characteristics. Hagendorff et al. (2010) propose combining board monitoring with external regulations but our study adopts board monitoring (through board characteristics) with managerial incentives. Sur et al. (2013) concluded that board

composition and ownership structure should be issues of complementary rather substitutable governance mechanisms. Creating value for firm implies an optimal mix of board effectiveness and minimization of the agency problem. We ascribe to the complementary model approach but differ on the choice of variables. Closely related to this motivation is on methodological grounds where the authors concluded that board characteristics is effective if it is moderated by the presence of non-convergence of shareholder and manager interests (Stockmans, Lybaert, & Voordeckers, 2013). We share in the position of the authors and therefore propose a model that confirms the relevance of controlling managerial opportunism. However, their research focussed on CEO non-duality, proportion of outside directors and the relationship with earnings management.

In another study which motivates this paper, the authors reported that material internal control weakness which stem from ineffective board monitoring and other corporate governance deficiencies give rise to escalating loan losses and loan loss provisions (Cho & Chung, 2016). When board monitoring functions are intensified and made effective, internal control weaknesses, agency problems and possible loan losses will be minimized. We propose board characteristics and insider ownership to address board monitoring and agency problems respectively and how they can jointly minimize non-performing loans. Another strong motivation for the study emanates from the European Central Bank's (ECB) declaration of NPLs as a major problem to the union (KPMG, 2017). The KPMG report indicates that as at 2016, European banks had about €1 trillion worth of NPLs. Non-Performing Loans do not only constitute loss of assets and drain in profitability but also inhibits the continuous flow of the credit cycle and the financial intermediation function. As part of pragmatic measures to resolve the worrying NPLs, the ECB directed that the losses should be absorbed by shareholders and other investors to avoid moral hazards (KPMG, 2017). Thus, a call on board of directors to intensify their monitoring and control functions to protect the assets of investors (shareholders, creditors and society) becomes inevitable. It is against this background that a study of the characteristics board of directors combined with managerial incentives to reduce the agency problem and NPLs has been undertaken.

This research aligns with previous studies (Faleye & Krishnan, 2017; Hagendorff et al., 2010; Srivastav & Hagendorff, 2016) but deviates on certain lines. Hagendorff et al (2010) studied board monitoring (three variables) and regulation and performance of the

banking industry whilst the current study extend board monitoring measures (to cover other characteristics) complemented with managerial incentives to address the complex and multifaceted nature of credit risk (NPLs). The work by Faleye and Krishnan (2017) focused on corporate lending but this study uses data that cover both individual and corporate lending since these sectors offer holistic financial intermediation to economic units. In the case of Srivastav and Hagendorff (2016) a comprehensive review of board effectiveness was done. The current study provides empirical evidence to support the good work done by Srivastav and Hagendorff.

We use panel data on intrinsic and extrinsic board characteristics from Orbis, S&P Global (formerly SNL Financials) databases and bank annual reports from company websites. Research on board characteristics has been widely published but none uses the classification into intrinsic and extrinsic board characteristics. We introduce this novelty classification because of its linkage with our research design. Apart from addressing the issue of the relationship between board characteristics and insider ownership on NPLs, we investigate whether the inclusion of insider ownership improves the negative relationship between board characteristics and NPLs or not. We find that, some board characteristics significantly reduce bank non-performing loans. We also report that the inclusion of insider ownership to the model reduces the standard errors and improves the predictive powers of board characteristics and control variables.

The study makes significant contribution to literature. Theoretically, we confirm that the use of managerial incentives (insider ownership) maximizes the value enhancing function of banks. This supports the agency theory. Again, the resource dependency theory is made more meaningful in the role of board of directors in their fiduciary role as monitors. From the stakeholder theory perspective, effective board monitoring protects the interest of not only shareholders but other indirect interest groups (society at large). Practically, the study affirms that it is not enough to leave the asset-safeguarding function alone to board of directors but complementing it with managerial incentives reduces NPLs better. Thus, a major concern for the European Central Bank is addressed in this study. Another contribution this study makes is that intrinsic board characteristics such as gender diversity and average age of board members are very crucial in reducing bank credit risk. This is very informative for recruiting members to serve on the board of banks and other financial institutions. To the best of our knowledge, the classification of board of directors

into intrinsic and extrinsic characteristics is the first in corporate governance research. This classification has implication for selecting who to recruit to serve on boards and for what purpose. The research affirms the agency and resource dependency theories in reducing the agency problem, creating value for the firm and justifying the recruitment of people to serve as board members. The remainder of the paper is made up of the literature and hypotheses development, methodology and data. The presentation of results, analysis, discussions and conclusions follow.

6.3 Literature and hypotheses development

The European banking industry is situated within a mix of strong resilient as well as emerging economies. Thus, the contribution of the legal, economic and socio-cultural systems to the banking industry varies across countries even though the European Union is doing well with its standardization policies. In recent times, the European banking environment has been plagued with economic stagnation, weaker banking sector and governance systems as well as high rates of bank asset quality, specifically non-performing loans (Barisitz, 2013).

6.3.1 Non-Performing Loans

There is no universally acceptable definition for non-performing loans probably due to variations in cross-national regulatory frameworks and banking practices. For this paper, operational definitions from international institutions and organizations who matter in the financial services industry (especially banking) will be considered. The International Monetary Fund (IMF) describes a loan as non-performing when servicing (payment of interest and principal) is past due by 90 days or more or interest payments for 90 days or more are capitalized, refinanced or delayed by agreement (Bloem & Freeman, 2005). Once a loan is classified as such, it must remain non-performing until written-off, interest and principal paid on it or subsequent loans that replaced the original. The Basel Committee on Banking Supervision (2016) defines NPL to cover non-performing exposures which are defaulted under the Basel framework, credit impaired, more than 90 days past due and where there is evidence to suggest doubts about ability to make full

payment in accordance with contractual terms. The Basel definition sees NPL as a regulatory term used for credit risk monitoring and management perspectives rather than an accounting concept (Basel Committee on Banking Supervision, 2016). The European Central Bank provides a wider definition just as that of Basel, which uses the term ‘non-performing exposure’ to cover default and impairment thus addressing accounting and regulatory issues that may arise.

Non-performing exposure constitutes material exposures which are more than 90 days past due and or the debtor upon assessment is unlikely to pay its credit obligations in full without realization of collateral, irrespective of the existence of any past due amount or the number of days past due (European Central Bank, 2016). The definition is grounded on the principles of ‘past due’ and ‘ability to pay’. Even though differences exist in the definitions, there are fundamental similarities that do not change the content of the concept.

Non-performing loans is a by-product of the financial intermediation function (credit supply) and used to measure the credit worthiness of the banking system. As an ex-post event, its consequences initiate banking crisis which can further trigger financial crisis (Reinhart & Rogoff, 2011). It is almost a global threat to financial intermediation with evidence provided among other places like Europe, the US and China. The severity of NPLs is varied with countries and with time and this might explain why systemic factors and other macroeconomic factors may account for differentials in their levels and impact in various countries (Beck, Jakubik, & Piloiu, 2013). Within Europe, there is huge debt overhang emanating from soaring NPLs that is stifling economic growth especially in the post-crisis period as found in the work of Erdinç and Abazi (2014) which further reported that GDP and inflation are macroeconomic determinants of NPLs whilst management quality is instrumental to loan defaults.

Addressing NPLs has come with several approaches including micro and macro-prudential measures. In a draft guideline to banks on NPLs, the European Central bank proposes among other measures, a control framework. As a second line defence control, the monitoring and quantification of NPL-related risk, reviewing the performance of the overall NPL operating model, quality assurance through loan processing, monitoring and

aligning these processes with internal policies (European Central Bank, 2016) fall within the purview of the board and senior management.

From the definitions of NPL, it is difficult to disassociate the involvement of management and board of directors in the initiation and contracting of loans, funding, servicing, monitoring, treatment and reporting in the balance sheet of banks. This is why we see the need for the joint roles of the board of directors and managers in addressing this market failure that is reported among the key risks facing European banking (Beck et al., 2013; European Central Bank, 2016). This is not to undermine regulatory and quantitative approaches to deal with NPLs but to offer another line which also adds up to the confidence of market participants. Suggestions from experts about maximizing the value, recovery and returns on NPL sales through the establishment of Asset Management Companies are worthwhile (Fell, Grodzicki, Martin, & O'Brien, 2016), they may however have some challenges. Maximizing returns and value on NPL sale might exacerbate the incentive for managers to increase the stock in the balance sheet. Relying on the monitoring acumen of board of directors, emphasizing their fiduciary role and responsibility to all stakeholders and aligning the interest of managers and owners will revive the waning confidence in the financial markets. The human elements at play in the upsurge of NPLs are undeniable as can be seen from the theoretical explanations provided by the agency theory, resource dependency and stakeholder theories. There is empirical evidence on NPLs from major economies and financial markets world-wide.

In the US, State and regional level studies show that greater capitalization, liquidity risks, poor credit quality, cost inefficiency and banking sector size significantly increase NPLs whilst bank profitability lower NPLs (Ghosh, 2015). The focus of the research by Ghosh was on banking industry and regional economic determinants for commercial and savings institutions. The relationship between corporate governance and NPLs was reported in the US (Tarchouna, Jarraya, & Bouri, 2017). The authors, using dynamic panel data reveal that small banks have sound corporate governance practices which reduce NPLs but same cannot be said of medium and large banks in their risk-taking behaviour. Their study used an index for corporate governance which included board characteristics for commercial banks in the US.

In China, NPLs has been the nucleus around which most banking regulations have been developed and since 2003, it has come under scrutiny with lots of capital being injected into the banking system to absorb the devastating effects of NPLs (D. Zhang et al., 2016). Zhang et al. (2016) reported that increases in NPLs has increased moral hazards, riskier lending and financial sector instability. It seems to suggest that, there are behavioural issues in the whole subject of NPLs. Switzer, Tu, and Wang (2018) studied 28 countries outside North America and confirmed that reduced default risk help revamp the stock market after the financial crisis whilst internal governance variables, insider ownership, board composition and CEO power and external regulatory factors significantly reduce default risk. Switzer et al. (2018) reported that the impact of governance variables on default was higher for Asian countries than for European countries. In this current study, we use a broader view of default (NPLs which include default) and concentrate on European countries to reveal what pertains to Europe. We proceed with the theoretical framework of the study.

6.3.2 Board characteristics and theories

There is abundance of research on board characteristics but most of such studies are either about non-financial institutions or the outcome variable is firm performance (Adams & Mehran, 2012; Badru, Ahmad-Zaluki, & Wan-Hussin, 2017; Jermias & Gani, 2014; Kaymak & Bektas, 2008; Sarkar & Sarkar, 2018). A dearth of literature exists on board characteristics and non-performing loans. The relationship between board demographics and performance remains inconclusive and the current study classify board characteristics into two; namely intrinsic and extrinsic characteristics.

6.3.3 Intrinsic and extrinsic board characteristics

This research uses a distinctive model which to the best of our knowledge is the first to be used in studies involving the relationship between board characteristics and credit risk at the cross-country level. Intrinsic and extrinsic categorization is very popular in the physical sciences. We view that board of directors have a latent structure with intrinsic and extrinsic attributes. In the opinion of Lewis (1983) a substance has intrinsic properties

when ‘something is entirely about that thing’. The intrinsic properties emanate because of the way the individuals are (Francescotti, 1999; 2014). The intrinsic properties are such that an object cannot exist without them (Graversen & Osterbye, 2002).

Francescotti explains extrinsic properties as when something is not entirely about that thing though some other part of it might be inclusive in the larger whole. Such properties are needed for a certain situation and not permanent in nature (Graversen & Osterbye, 2002). The extrinsic properties of an object is as a result of the way the whole is instead of the thing itself (Marshall & Weatherson, 2018). Thus, the extrinsic characteristics are predefined until the inclusion of the individuals that constitute the group.

The philosophical relevance of this classification explains that the qualities board members carry before their appointment are intrinsic whereas those they possess as a result of joining the others (group) are extrinsic (Marshall & Weatherson, 2018). The characteristics of the board of directors such as size, independence, tenure, staggered board are predefined in nature. With this classification, group identity of the board is more pronounced than individualism as was emphasized by McNulty, Florackis, and Ormrod (2013). The authors support existing theories in their findings that boards’ work through group processes significantly affect financial risk. On the other hand, board characteristics such as gender and age are attributes within the individual members and can hardly change irrespective of where they are. It is specious to take a one-sided collective view of the board members but also considering their individual responsibilities (Miller-Stevens & Ward, 2014). A more balanced and holistic assessment of board of directors is the two-sided view which combines their intrinsic and extrinsic properties to function. Boards have oversight responsibility on corporate risk taking activities including investments (Harjoto, Laksmana, & Yang, 2018) such as loans. Harjoto et al admit that investment oversight is a complex task that require maximizing the diversity economies from board characteristics. They categorize board characteristics into relation-oriented (age, gender, race) and task-oriented (tenure, expertise) dimensions in monitoring performance. By the classification of Harjoto et al. (2018), the relation-oriented characteristics are what we refer as intrinsic whilst the task-oriented ones are extrinsic.

A lot of researchers have used the agency theory and few others, the stewardship theory to provide theoretical support for topics related to board of directors and corporate governance. Same can be said about studies on board characteristics. After studying board demographic variables and firm performance, it was concluded that each of the three theories (agency, stewardship and resource dependency) explained particular aspect of board performance and therefore suggested process-oriented approach (Nicholson & Kiel, 2007). We ascribe to this notion that no single theory comprehensively explains board functions and therefore employ two different but related theories in explaining board characteristics and the expectations on their monitoring and control functions to safeguard shareholder assets. The limitation of the agency theory in explaining the relationship between board characteristics and performance was reported by García-Ramos and García-Olalla (2011). We believe that, the characteristics of board of directors cast a first impression about its capacity to deliver in minimizing the agency problem which give reasonable assurance to shareholders and potential investors. Relating this to the rationale behind recruiting certain individuals to serve on boards, the resource dependency theory fits our research. The resources dependency theory finds explanation to our classification of board characteristics. In theory, board of directors bring into the firm their intrinsic characteristics as resources the firms can rely on. The intrinsic board characteristics are innate human capital which serve as useful resources board members bring on board. In a broader sense, the human capital theory serve as precursor to the resource-based theory (Dalton & Dalton, 2011). Firms leverage on the human capital (resource) expertise of board members by engaging in stronger management diversity for effective monitoring (Mullins, 2018). Shareholders repose so much confidence in board members based on their expertise, experience and other attractive individual attributes that suggest their capabilities.

The other theory that offer explanation to the study is the stakeholder theory. Board of directors have a duty to safeguard the assets of shareholders and minimize the utility maximizing tendencies of the agent through effective monitoring (Fama & Jensen, 1983; Shleifer & Vishny, 1997). When the objective function of board of directors is achieved, value maximization should not be narrowly viewed as beneficial only to shareholders but other claimants such as debt holders, preference shares, warrants and indirect interest groups; which was described as enhanced or long-term value maximization (Jensen,

2001). Board functions should not over-emphasize the interest of ordinary shareholders to the neglect of other stakeholders whose interest (direct or indirect) equally need to be protected (Aguilera, 2005; Williams & Conley, 2005). Aguilera emphasizes that the governance and allocation of power in Anglo-Saxon and Continental Europe has shifted towards seeking the interest of the larger stakeholder rather than only shareholders. There is a net indirect societal benefit (social welfare) when market failures such as loss of investment resources through non-performing loans are addressed. Therefore, the stakeholder theory rather than the agency theory provides an appropriate explanation to board characteristics. Financial institutions have unique characteristics which include opacity and better informational economies; they are heavily regulated and managers have fiduciary responsibility to both shareholders and non-shareholders (Zagorchev & Gao, 2015). The unique feature about financial institutions (especially banks) make them accountable to stakeholders with indirect interest because their activities affect the entire economy; making the stakeholder theory more relevant.

In their study of financial institutions worldwide during the period of the 2007-2008 financial crisis, Erkens, Hung, and Matos (2012) were dissatisfied with the one-sided protection of debt-holder rights to the neglect of long term shareholder rights. Their research makes a strong case for protecting and maximizing the interest of all stakeholders. Using non-financial firms in the US, Arena, Bozzolan, and Michelon (2015) report that stakeholder orientation of board of directors' monitoring function plays a transparency role in reporting the firm's excellent performance. In an era where investor confidence is waning in the financial services industry due to weak corporate governance systems and board ineffectiveness, the best way to regain the confidence of economic units is by seeking to satisfy all stakeholders whose interest seem to be marginalized. In the relationship between moral hazards and non-performing loans, two types of moral hazards can be identified: management investment in 'pet project' resulting in poor monitoring of loans and the conflict of interest between shareholders and creditors (D. Zhang et al., 2016). Shareholders may be interested in risky loans and shift the risk to depositors. Such conflicts may be possible where the board is only seeking the interest of shareholders but not under stakeholder theories. Stakeholder theories minimize risk shifting incentives of managers and shareholders.

Board characteristics is an aspect of corporate governance that create or destroy firm value by their effectiveness in controlling management (Kang, Cheng, & Gray, 2007). The individual and group characteristics of boards stimulate confidence in investors and add value to the firms they serve. Shareholders monitor the agent (management) through direct supervision, reliance on external auditors and board control functions (Hagendorff et al., 2010; Kaymak & Bektas, 2008; Zona & Zattoni, 2007). Board characteristics like size, structure and board independence improve the monitoring, advising and value creation functions of board of directors (Pablo de Andres & Vallelado, 2008).

From the US context, board configuration such as busyness of board, more gender diverse towards females and long tenure could have prevented or minimized the devastations of subprime lending (Muller-Kahle & Lewellyn, 2011). Bank holding companies (BHCs) with high risk management index (RMI) have board characteristics like size, independence, experience, executive compensations and lower NPLs (Ellul & Yerramilli, 2013). Board characteristics have positive impact on bank asset quality in China (Liang, Xu, & Jiraporn, 2013). However, Liang et al. (2013) seem to portray a narrower view of board characteristics. It is reported that board characteristics are effective in the monitoring function of firm risk management frameworks (Ahmad et al., 2015). Falaye and Krishnan (2017) assert that banks with more effective boards are less likely to lend to risky borrowers during periods of industry distress. The authors measure effective boards as an index of board characteristics such as small size, independence, non-CEO duality, non-staggered board and presence of board level risk committee which provide some guarantee of effective loan monitoring and supervision.

Tarchouna, Jarraya, and Bouri (2017) used an index of corporate governance variables in a dynamic GMM model and found that sound corporate governance system of small banks reduced non-performing loans in the US but failed to protect medium and large US commercial banks from excessive risk-taking behaviours that impaired loan quality. We have some scepticisms about the use of an index in measuring broad concepts such as corporate governance. Creating indices always lump many variables as one and may suppress potentially significant stand-alone variables thereby producing misleading results. The various findings lay emphasis on the relevance of board characteristics in the governance of banks. The differences in the relations reported create a research gap, which this current work intends to fill. Our study contributes to the corporate governance

literature by introducing a categorization of board characteristics into intrinsic and extrinsic attributes. We hypothesize from the deliberations that:

H_{1a}: Intrinsic board characteristics is negatively associated with bank NPLs

H_{1b}: Extrinsic board characteristics reduce bank NPLs

6.3.4 Insider (Managerial) ownership

Insider or managerial ownership is the owning of stocks or shares of executives or management of the company they serve. Management may engage in moral hazards such as the pursuit of personal interest or engaging in sub-optimal investments and other forms of weak protection of assets. Insider ownership (also known as managerial ownership) is one of the compensation schemes used to align the mismatching interests of principal (shareholders) and agent (management) in the firm (Darabos, 2014; Fama & Jensen, 1983; Hagendorff et al., 2010). Loans have been the greatest single largest contributor to assets in most bank balance sheets (Beck & Demircuc-Kunt, 2009). Gulamhussen, Pinheiro, and Sousa (2012) reported a non-linear ‘U’ shaped relation between managerial ownership and bank risks among 123 banks in the STOXX Global Index. The researchers confirm the agency theory in explaining the relation between managerial ownership and risks. In engaging in such crucial asset-generating activity like loan creation, some negative behaviours might be exhibited by managers leading to high non-performing loans in the books of the bank (Andreou, Cooper, Louca, & Philip, 2017; Elyasiani & Zhang, 2017; Moro & Fink, 2013; D. Zhang et al., 2016). The authors mention moral hazards such as accounting treatment of loan losses, managerial trust, exploitation of weak supervisory banking environment, and entrenchment on the part of top management. Tanaka (2016) posits that firms with high managerial ownership show signs of high performance, have risk taking incentives and enjoy higher yield spreads. The author finds consistency with the risk-shifting and entrenchment hypotheses. Darabos (2014) maintains that managerial ownership is an effective way of aligning the mismatching interests of the owner and manager but cautions that in the long run, it may lead to over-entrenchment of managerial powers to consolidate their position.

The agency theory provides explanations to the use of insider/managerial ownership to control the agency problem. Making managers equity owners reduces the conflict of interest between the agent and principal (Jensen & Meckling, 1976) which is also value enhancing to the firm (Gulamhussen et al., 2012). Earlier studies report that firms with higher insider ownership tend to invest in assets with lower systemic risks and less reliance on debt as component of capital structure (Capozza & Seguin, 2003). In the work of Keys, Mukherjee, Seru, and Vig (2009), there was no significant relation between managerial incentives and the performance of loans in the US. This is probably because unlike our current study which uses the share option incentive (insider/managerial ownership) there could be other managerial monetary incentives which the researchers might have used. Managers tend to behave in a more prudent manner in safeguarding the assets of owners thereby minimizing the agency cost and enhancing value when they own some shares of the company. Contrary to this popular notion that managerial incentives (financial or equity options) reduce risk taking behaviour of managers, Bebchuk et al. (2010) use the case of Bear Stearns and Lehman in their paper ‘The Wages of Failure’ to challenge the assertion. They found that even though executives of these companies were enjoying heavy compensations, it was not enough to prevent the moral hazards they engaged in. Bebchuk et al (2010) do not write-off the use of incentives but recommend incentives with conditions that will reduce moral hazards on the part of executives. Some of these findings contribute to the inconclusiveness on the managerial incentive-risk relationship especially the case of insider ownership and non-performing loans (credit risk).

The effectiveness of insider owners in minimizing the agency costs and controlling firm resources is positively related to the extent of ownership they have as reported by Lugo (2016). The author reports an inverse U-shape relationship between insider ownership and cost of debt. From the deliberations above, we hypothesize that;

H₂: Insider ownership is inversely related to bank NPLs

H₃: Insider ownership improves the monitoring function of board of directors in reducing bank NPLs

6.4 Description of variables

The next section covers the description of variables used in the model.

6.4.1 Dependent variable

Non-Performing Loans

Reducing Non-performing loans has been the focus of many banking sector reforms and regulatory bodies. We measure non-performing loans by total impaired loans as ratio of total loans. Previously and popularly used is the ratio of non-performing loans to total loans which is described as default (Ghosh, 2015).

6.4.2 Independent variables

The independent variables are board characteristics and insider ownership. The board characteristics are intrinsic or extrinsic in nature and cover attributes like diversity, composition and structure.

6.4.2.1 Board size

The relationship between board size (measured by the number of board members) and dependent variables such as performance, risk taking and firm value, has been variously reported. In most banking research, the dependent variables have been performance (ROA, Tobin's Q). It is found that firms with large board size show signs of lower performance volatility and lower bankruptcy risk among Japanese firms but not in the US (Nakano & Nguyen, 2012). Captured among board structure variables, board size was reported to decrease bank performance (Pathan & Faff, 2013). The estimation technique was a two-step system generalized method of moments (GMM) for US banks. A panel data study of Chinese banks found significant effect of board size on performance but not on asset quality (Liang et al., 2013). In the US, it is reported that corporate governance structures of banks with larger boards are associated with lower credit risk (Switzer & Wang, 2013). This is yet to be confirmed in a cross-country study within Europe. In the case of Romanian banks, it was reported that board size negatively affect business failure risk in a study using principal component analysis and multivariate regression analysis

(Armeanu et al., 2017). These inconclusive reports and gaps about board size gives relevance to our study. We conjecture that board size will reduce non-performing loans.

6.4.2.2 Board independence

Research on the Organization for Economic Cooperation and Development (OECD) countries found that, a not-too-large independent board members might be efficient in creating value through the monitoring and advisory functions of the board (Pablo; de Andres & Vallelado, 2008). Board independence is linked to board effectiveness which end up maximizing firm value (Wagner, 2011). The relationship between board independence on key variables such as performance, value and risks is various. Using a 34-year bank-firm data, Adams and Mehran (2012) reported no relationship between board independence and bank performance. They measured performance by Tobin's Q, which some authors use as proxy for firm value. This is yet to be tested on NPLs in European banking. Liang et al. (2013) reported a significant negative relation between board independence and stock of non-performing loans but not on the ratio of NPLs and total loans. More independent board members have less significant relation with credit risk levels among US commercial banks (Switzer & Wang, 2013). In Indonesia and Bangladesh, board independence is said to positively affect bank performance (Kutubi, 2011; Tulung & Ramdani, 2018). Most of these studies either use performance or value as an outcome variable or conducted outside Europe. It is not yet known what pertains to European banking. We measure board independence by the ratio of outside members to total board members and expect a negative relation with NPLs.

6.4.2.3 Staggered board

Staggered or classified board is a board structure system used to weaken shareholder voice by ensuring the existence one-third of board members are re-elected (Aguilera, 2005). Maintaining a certain quota of boards enables continuity of mission and strategy but may also stifle change and innovativeness responsive to the dynamic business environment. The relation between staggered boards and firm value has been reported as negative (Bebchuk & Cohen, 2005). In a study on the relationship between board structure and bank performance, staggered boards (used as proxy for protection from threat of external takeover) was found to have some relation with performance (Pathan & Faff, 2013). Contrary to Bebchuk and Cohen (2005), staggered board is reported to have

positive relation with firm value from a comprehensive time series data from 1978-2011 (Martijn Cremers et al., 2014). The authors show that firms' motivation to adopt staggered board stems from previous trend of low value which is corrected after staggering thus reconciling their results to existing results from cross-sectional studies. Even though this current research is specifically about firm value, it is believed that the level of NPLs affect the value of the bank and staggered board may correlate other factors which affect NPLs. These inconclusiveness on staggered boards need to be settled in corporate governance research. In previous studies, staggered board is either captured under board structure (Pathan & Faff, 2013) or CEO or managerial entrenchment (Elyasiani & Zhang, 2017; Ghouma, 2017). Our current study classifies it under extrinsic board characteristics using a dummy variable of '1' if a bank has staggered boards and '0' if it does not and anticipate an inverse relation with NPLs.

6.4.2.4 Board gender diversity

The presence of females on boards of directors improves firm performance, provides a pluralistic view of pooling resources, skills and talents from diverse sources, increases market responsiveness and value and improves corporate governance (Doldor, Vinnicombe, & Gaughan, 2012; García-Meca, García-Sánchez, & Martínez-Ferrero, 2015; Liu, Wei, & Xie, 2014). When qualified women serve as board of directors, governance improves which translates into profitability. In the US, financial institutions that engaged in high subprime lending among other factors had low female representation on their boards (Muller-Kahle & Lewellyn, 2011). Studying OECD countries, Gulamhussen and Santa (2015) reported a negative relation between female representation on supervisory boards and risk taking. They again found that, markets valued some banks with females on the board. Sila, Gonzalez, and Hagendorff (2016) did not find any evidence of board room gender diversity on firm equity risk after controlling for reverse causality in a dynamic model. The influence of board diversity may vary across unitary and dual board governance structures in Europe (Farag & Mallin, 2017). The authors reported that females on supervisory and board of directors may reduce banks predisposition to financial crisis but those serving on management boards were not risk averse and showed a non-linear relation with financial fragility. Thus, the roles assigned to female directors may regulate their risk preferences. It seem to suggest that the presence of females on boards provide some safety nets for investors and potential investors and

this could explain why the European Parliament is making it a regulatory requirement for listed companies to have at least 40% female representation on their non-executive boards by 2020 (European Commission, 2012).

However, Low, Roberts and Whiting (2015) caution against the imposition of female representation on boards (through quotas) especially in countries with strong cultural resistance. They report diminishing positive impact of women on boards in countries where women have higher economic participation and empowerment. Owen and Temesvary (2018) found non-linear relationship between gender diversity and bank performance and further cautions that, positive effect of women representation on boards will maximize value only for heavily capitalized banks. Women bring innovativeness on the board but this is a function of the quality of management. These mixed reports about board gender diversity make this study worth pursuing especially on the relationship with NPLs.

6.4.2.5 Board average age

There is little to show on board characteristics research which have considered the age of board of directors and their relationship with non-performing loans in European banking. From a sample of US banks, directors above seventy years was used as proxy for seniority of board members in the model but was dropped because of its insignificance (Byrd, Cooperman, & Wolfe, 2010). In a particular one on bank credit risk and corporate governance structures in the US, Switzer and Wang (2013) used the age of the Chief Finance Officer (CFO) and found that banks with older CFOs had lower credit risk levels. In this current study, we cover the age of all board members represented by an average age. Talavera, Yin, and Zhang (2018) report that board age diversity is negatively related to bank financial performance; adding that the heterogeneity of board members' views on risks, prudence and value has the tendency to trigger intragroup conflict, which slows down board decision-making process.

6.4.2.6 Board tenure

Board tenure is the period designated to the board of directors to be in office. Research on board tenure has mixed results in corporate governance research. As board tenure increases, members become more committed to the firm they serve; thus a positive

relation is reported between board tenure and commitment (Vafeas, 2003). Kaymak and Bektas (2008) found a negative relationship between board tenure and bank performance. With time, a long staying board may develop familiarity with management, which might affect their vigilance. A study by Byrd et al. (2010) on US banks revealed no significant relationship between board tenure and executive compensation for the entire sample. However, they found some relation, which support the CEO allegiance hypothesis for board tenure from six years and above using subsamples. Board tenure is measured by an average number of years served as provided by the databases or annual reports.

In the case of the US financial services industry from 1997-2005, Muller-Kahle and Lewellyn (2011) provide evidence that subprime lenders were characterized among other factors by less board tenure. Their study thus reports a relationship between board tenure and lending but not with the outcome of lending such as NPLs. Harjoto et al. (2018) described board tenure as task-oriented board performance and reported tenure as effective in the oversight of firm investment activities. Their study reports that task-oriented diversity like tenure has implications for regulatory requirements. In all these researches cited, none reports the relationship between board tenure and NPLs. We expect an inverse relation between the variables.

6.4.2.7 Insider ownership

Insider ownership is measured by the percentage of shares held by management members as percentage of total shares. Compensating management with equity options will reduce the tendency to engage in value depleting actions especially loan creation. It is therefore assumed that an inverse relation exists between insider ownership and NPLs. There is a school of thought that regulations reduce the influence of managerial decisions on shareholder value and therefore internal monitoring of agents are of minimal relevance in minimizing the conflict of interest between the agent and the principal (Booth, Cornett, & Tehranian, 2002). Banks substitute between governance mechanisms that align the interests of shareholders and managers and reports statistically significant relationship between insider ownership and bank performance (Belkhir, 2006). However, these significances disappear with the introduction of board characteristics in the model. Belkhir (2006) posits that ownership structure and board characteristics are substitutes for bank performance, but our current study see them as complementary to monitoring

credit risks. In another study, Chun, Nagano, and Lee (2011) report no effect of managerial ownership on bank risk in Japan and Korea but for the introduction of franchise value, a significant negative relation was recounted. Thus, bank franchise value served as disciplinary measure to managerial ownership, which according to them, confirms the moral hazard hypothesis.

6.4.3 Control variables

The control variables are bank and country-related variables. The bank characteristics that can affect monitoring NPLs for the purpose of this study is size. In the US, large banks with strong boards positively affect bank risk taking (Pathan, 2009). There are macro-economic factors that affect NPLs (Erdoğan & Abazi, 2014). Among these country-specific factors include GDP, inflation and lending rates. We therefore control these variables in our model.

6.5 Methodology

The choice of a model that combines board characteristics with insider ownership in a single study is motivated by the work of Stockmans et al. (2013). According to Stockmans et al. (2013), the effectiveness of board characteristics is conditional in nature. It is conditioned on the presence or suspicion of the agency problem. We hold same assumption and test whether mechanisms for dealing with agency problem will improve or be indifferent to the effectiveness of board characteristics in reducing NPLs.

$$NPL_{i,t} = \alpha + \beta \sum_{j=1}^6 BodXtics_{i,t} + \gamma InsiderOwn_{i,t} + \varphi Control_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $i = 1 \dots 102$ banks, $t = 2008 \dots 2014$, α is the constant, β , γ , φ are coefficients to be estimated and ε is the error term. *BodXtics* represent the set of board characteristics which affect non-performing loans, *InsiderOwn* represent insider ownership and *Control* represents the set of control variables.

But board characteristics is a function of six variables which were used in this model

$$BodXtics = f(AvBodAge, BodDiver, StaggBod, AvTenure, BodIndepen, BodSize) \quad (2)$$

where;

AvBodAge = average board age,

BodDiver = board diversity (percentage of females on board),

StaggBod = staggered board,

AvTenure = average board tenure,

BodIndepen = board independence and

BodSize represents board size

An extended model which contains all variables used can be found below.

$$NPL_{i,t} = \alpha + \beta_1 AvBoardAge_{i,t} + \beta_2 BodDiver_{i,t} + \beta_3 StaggBod_{i,t} + \beta_4 AvTenure_{i,t} + \beta_5 BodIndepen_{i,t} + \beta_6 BodSize_{i,t} + \gamma InsiderOwn_{i,t} + \varphi_1 BankSize_{i,t} + \varphi_2 Infla + \varphi_3 InterestRate + \varphi_4 GDP + \varepsilon_{i,t} \quad (3)$$

6.6 Data

The study obtained data from various sources. About 80% of the data was obtained from S&P Global (formerly SNL Financials). Some of the variables include financial data, insider ownership and board characteristics. However, there were some number of missing data and this was where we fell on other sources like Datastream, Orbis Bank Focus (formerly Bankscope) and company websites for annual reports. Developments after the global financial crisis include regulations and directives to intensify and improve corporate governance practices and supervisory mechanisms of banks. It is against this background that this study targets the crisis and post-crisis periods of 2008-2014.

TABLE 6.1: Sample description

Countries	No of banks	No of observations	Years
Austria	2	8	2011-2014
Belgium	1	7	2008-2014
Bulgaria	2	13	2008-2014
Czech Republic	2	7	2008-2013
Denmark	18	113	2008-2014
Finland	2	12	2008-2014
France	4	22	2008-2014
Germany	6	27	2008-2014

Greece	5	35	2008-2014
Hungary	2	14	2008-2014
Ireland	3	21	2008-2014
Italy	15	105	2008-2014
Macedonia	1	7	2008-2014
Malta	1	7	2008-2014
Netherlands	1	7	2008-2014
Poland	10	67	2008-2014
Portugal	2	14	2008-2014
Romania	2	14	2008-2014
Slovenia	3	16	2008-2014
Spain	8	48	2008-2014
Sweden	3	12	2011-2014
UK	5	23	2008-2014
Total	102	599	

The data covers 102 banks from 22 European countries. The data is an unbalanced panel due to missing data for some banks in certain years. In all, 599 bank-year observations were suitable for the analyses. Table 6.1 shows the summary. The key variables used for the study are NPLs, average board age, board gender diversity, staggered board, average board tenure, board independence, board size, insider ownership, bank size, inflation, interest rate and GDP. Data was collected for diversification and bank age for the purpose of sensitivity and endogeneity analyses. Banks with less than four years of available data on all the variables were not included in the study. In most cases, banks had data on financial information but not on corporate governance variables.

6.7 Findings and discussions

The results of the study follow in the next sections. This section comprises the descriptive statistics, correlation matrix, various regression analyses including endogeneity and discussion of results.

6.7.1 Descriptive statistics

The descriptive statistics covers the number of observations per variable, means, standard deviation and percentiles. The result can be found in Table 6.2.

Variables	N	mean	sd	p25	p50	p75
NPLs	599	10.98	12.17	3.330	3.330	13.76
Average board age	599	58.19	4.814	56	56	61
Board diversity	599	0.237	0.296	0.0950	0.0950	0.286
Staggered board	599	0.272	0.445	0	0	1
Average tenure	593	4.686	2.238	3	3	6
Board independence	599	0.569	0.997	0.250	0.250	0.680
Board size	599	11.91	5.170	8	8	15
Insider ownership	599	1.669	7.895	0	0	0.010
Bank size	599	16.90	2.269	15	15	19
Inflation	599	2.060	1.656	0.890	0.890	3.196
Interest rate	596	3.003	2.973	0.573	0.573	4.757
GDP	598	-0.0499	2.800	-1.064	-1.064	1.625

Table 6.2 shows the summary statistics for the dependent variable NPLs, insider ownership, intrinsic and extrinsic board characteristics and control variables. The missing data in certain years on some variables is evident in the sample (N). The average bank has NPL of 10.98 and standard deviation 12.17. The mean and median the values of some of the variables are almost the same; for example, average age, average tenure, board size, bank size and inflation. The average bank has 1.67% percent of insider ownership and with about 24% of average female representation female representation on the board. On the average, board members are old (58 years) and this has implications for decision making (conservatism or aggressiveness) and risk-taking behaviour.

Table 6.3: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12
NPLs (1)	1											
Average board age (2)	-0.085*	1										
Board diversity (3)	-0.141***	-0.006	1									
Staggered board (4)	0.0648	-0.051	0.137***	1								
Average tenure (5)	-0.0981*	0.273***	-0.0718	0.0084	1							
Board independence (6)	-0.0618	-0.0047	0.0366	-0.066	0.0278	1						
Board size (7)	-0.293***	0.333***	-0.097*	-0.066	0.112**	0.0181	1					
Insider ownership (8)	-0.163***	0.0046	-0.0404	-0.105*	0.0392	-0.0195	-0.0622	1				
Bank size (9)	-0.275***	0.3191	0.0138	-0.078	-0.109**	0.0261	0.567***	-0.176***	1			
Inflation (10)	0.0422	-0.0325	-0.0455	-0.0168	-0.0171	-0.03	-0.165***	0.0233	-0.149***	1		
Interest rate (11)	0.217***	-0.0277	-0.0345	-0.0118	-0.048	-0.086*	-0.138***	0.0593	-0.203***	0.434***	1	
GDP (12)	-0.0707	-0.0381	0.0574	-0.0332	-0.0128	-0.0464	-0.253***	0.0477	-0.0996*	0.170***	-0.010	1

*=p<0.1, **=p<0.05, ***=p<0.01

Table 6.3 reports the correlation matrix for the variables. There are weak correlations between the independent variables with the highest correlation coefficient being 0.567 (board size and bank size). This is an indication that there is no problem of multicollinearity.

6.7.2 Empirical results

The regression of only the independent on the dependent variables shows no difference of the significance level when insider ownership is included in the model. Comparing Models 1 and 2, board average and diversity are significant at 95% confidence interval whilst board size and insider ownership are significant at 99% confidence interval. The control variables (bank and country macroeconomic factors) were introduced in Models 3 and 4 where no change is seen about the independent variables in Model 3. All the controls had various significance levels ranging from $p < 0.1$, 0.05 and 0.01 in Model 3 but the inclusion of insider ownership in Model 4 improves the relationship between board average and NPLs ($p < 0.1$). The robust standard errors were run for Models 5 and 6 where the former does not include insider ownership. The relevance of insider ownership is seen in Model 6 where the coefficient of board independence is significantly improved at $p < 0.05$ compared to $p < 0.1$ in Model 5. It can also be seen from Model 6 that average board age is significant ($p < 0.1$) which is not the case in previous models.

Board size ($\beta = 0.587$, standard error = 0.0887), board diversity ($\beta = -5.878$, standard error = 1.372) and insider ownership ($\beta = -0.366$, standard error = 0.043) are significant at 99% confidence interval. Other board characteristics that show significant relation with NPLs are board independence and average board age ($p < 0.05$). Apart from inflation, all control variables are important determinants of non-performing loans.

Table 6.4: T-test (mean comparison) of diversified and non-diversified banks

Variables	Non-diversified banks	Diversified banks	Difference	t-statistic
NPLs	12.8653	9.1233	3.742***	3.7997
<i>Panel A: Intrinsic board characteristics</i>				
Average board age	57.4007	58.9635	-1.5628***	-4.0160

Board diversity	0.2081	0.2665	-0.0583**	-2.4175
<i>Extrinsic board characteristics</i>				
Staggered board	0.2593	0.2857	-0.0265	-0.7255
Average tenure	4.6075	4.7592	-0.1517	-0.8238
Board independence	0.6207	0.5194	0.1012	1.2415
Board size	11.367	12.4518	-1.0848**	-2.5758
Panel B: Insider ownership				
Insider ownership	0.5267	2.8026	-2.2759***	-3.5559
Panel C: Control variables				
Bank size	16.5185	17.2824	-0.7639***	-4.1690
Inflation	2.0581	2.0639	-0.0058	-0.0430
Interest rate	2.7156	3.2948	-0.5792**	-2.3846
GDP	-0.2939	0.1863	-0.4803**	-2.1001

="* p<0.05 ** p<0.01 *** p<0.001"

We performed sensitivity analysis by classifying our sample into diversified and non-diversified banks to find out if significant differences exist in the chosen variables. These forms of classifications and further analysis controls for inconsistencies and provide confirmations to main results. We follow previous research in board characteristics and bank performance in adopting this approach to complement other robustness checks on our results (Leung, Taylor, & Evans, 2015; Sarkar & Sarkar, 2018). Table 4 shows the results.

6.7.3 Board characteristics and non-performing loans

There were two hypotheses proposed for the relationship between board characteristics and non-performing loans. The first hypothesis (H_{1a}) states that intrinsic board characteristics reduce NPLs. The results from the robust OLS regression shows that whilst one variable significantly reduces NPLs (board diversity; $p<0.01$), the other (average board age; $p<0.1$) increases it. The result shows that average board age increases the level of NPLs. With a mean age of 58years, it is normal for members to have reached an optimal level of experience acquired in practice to warrant efficient monitoring of managers. The positive relation between average age and NPLs is in contrast to our

hypothesis. Contrary to earlier findings where Byrd et al. (2010) find no significant relationship between board age and CEO compensation, Switzer and Wang (2013) and Talavera et al. (2018) report inverse relations. The inverse relation between the number of females on board (board gender diversity) is consistent with literature and thus supports our hypothesis. Previous research has reported such negative association between gender diversity and board risk-taking behaviour (Gulamhussen & Santa, 2015; Muller-Kahle & Lewellyn, 2011) even though others make contrary findings.

The second part of the first hypothesis (H_{1b}) states that extrinsic board characteristics reduce NPLs. We find support for this hypothesis. The results from the baseline regression of the robust OLS regression finds average board tenure ($p < 0.05$), board independence ($p < 0.05$) and board size ($p < 0.01$) to have significant negative effect on NPLs. Staggered board has negative but no significant relation with non-performing loans. Not much can be reported on the relationship between board tenure and NPLs but with performance (Kaymak & Bektas, 2008). Board independence (mean = 0.56) is not too large for this study and consistent with previous studies, boards with not too large independence have better monitoring and value creation functions (Pablo; de Andres & Vallelado, 2008). Our results support existing literature that board independence leads to board effectiveness (Wagner, 2011) which in this case is reducing NPLs. Mean and median board sizes were 12 and 11 respectively indicate not too large board size among European banks. Board size has significant negative relation with NPLs thus confirming a study in Romania which established that board size reduces business failure risk (Armeanu et al., 2017).

Table 6.5: OLS (Baseline) regression for board characteristics, insider ownership and NPLs

	(1) NPLs	(2) NPLs	(3) NPLs	(4) NPLs	(5) NPLs	(6) NPLs
Average board age	0.107 (0.107)	0.112 (0.105)	0.197 (0.107)	0.229* (0.105)	0.197 (0.111)	0.229* (0.109)
Board gender diversity	-7.629*** (1.616)	-7.849*** (1.588)	-6.958*** (1.573)	-7.127*** (1.531)	-6.958*** (0.938)	-7.127*** (0.955)
Staggered board	1.962 (1.070)	1.426 (1.057)	1.616 (1.042)	0.945 (1.021)	1.616 (1.000)	0.945 (0.992)
Average board tenure	-0.480* (0.219)	-0.434* (0.216)	-0.619** (0.221)	-0.624** (0.215)	-0.619** (0.221)	-0.624** (0.217)
Board independence	-0.513 (0.472)	-0.568 (0.464)	-0.400 (0.460)	-0.445 (0.447)	-0.400 (0.206)	-0.445* (0.203)
Board size	-0.730*** (0.0968)	-0.764*** (0.0953)	-0.598*** (0.115)	-0.574*** (0.112)	-0.598*** (0.0941)	-0.574*** (0.0847)
Insider ownership		-0.282*** (0.0589)		-0.333*** (0.0575)		-0.333*** (0.0312)

Bank size			-0.813** (0.264)	-1.075*** (0.261)	-0.813** (0.248)	-1.075*** (0.238)
Inflation			-0.626* (0.314)	-0.663* (0.305)	-0.626 (0.432)	-0.663 (0.416)
Interest rate			0.724*** (0.175)	0.750*** (0.170)	0.724** (0.241)	0.750** (0.235)
GDP			-0.531** (0.172)	-0.493** (0.168)	-0.531* (0.206)	-0.493* (0.202)
_cons	17.35** (5.816)	17.97** (5.711)	23.88*** (6.304)	27.06*** (6.159)	23.88*** (5.889)	27.06*** (5.802)
<i>N</i>	593	593	590	590	590	590
<i>R</i> ²	0.129	0.162	0.193	0.237	0.193	0.237

Table 6.5 presents the baseline OLS regression estimating the relationship between NPLs and board characteristics and insider ownership. The sample comprises 102 banks from 22 European Union countries for the period 2008-2014. We collected data from S&P Global (formerly SNL Financials), Datastream, Bankscope (now Orbis Bank Focus) and annual reports from company websites. In models 1 and 2, the main independent variables were regressed on the dependent variable, in which Model 1 excludes insider ownership and Model 2 includes it. We introduced the control variables in Models 3 and 4 where the former excludes insider ownership and the latter has it in the model. In Models 5 and 6, we run robust standard errors for the model where Model 5 drops insider ownership and Model 6 includes it. In all cases, the inclusion of insider ownership to intrinsic and extrinsic board characteristics make differences in the relationships between the dependent and independent variables. The estimated coefficients showing the relationship between the variables have been shown whilst the standard errors are represented in parentheses. The table also reports the sample observations (*N*) and the *R*² for each of the models. The stars show the significance of the variables and the interpretation follows:

p*<0.1, *p*<0.05, ****p*<0.01

Standard errors in parentheses

Table 6.6: 2SLS regression for board characteristics, insider ownership and NPLs

	(1) NPLs	(2) NPLs	(3) NPLs	(4) NPLs	(5) NPLs (robust s.e)	(6) NPLs (robust s.e)
Staggered board	-5.791 (5.822)	-7.377 (5.946)	-3.607 (5.710)	-5.158 (5.748)	-3.607 (4.410)	-5.158 (4.569)
Average board age	0.0681 (0.114)	0.0692 (0.114)	0.182 (0.110)	0.215* (0.108)	0.182 (0.114)	0.215 (0.113)
Board gender diversity	-6.018** (2.055)	-6.082** (2.039)	-5.851** (1.987)	-5.870** (1.948)	-5.851*** (1.386)	-5.870*** (1.446)
Average board tenure	-0.421 (0.232)	-0.360 (0.232)	-0.595** (0.225)	-0.597** (0.221)	-0.595** (0.220)	-0.597** (0.216)
Board independence	-0.761 (0.523)	-0.857 (0.524)	-0.573 (0.501)	-0.650 (0.494)	-0.573* (0.247)	-0.650** (0.247)
Board size	-0.756*** (0.102)	-0.800*** (0.103)	-0.610*** (0.117)	-0.585*** (0.115)	-0.610*** (0.100)	-0.585*** (0.0898)
Insider ownership		-0.334*** (0.0708)		-0.372*** (0.0689)		-0.372*** (0.0445)

Bank size			-0.878** (0.276)	-1.180*** (0.284)	-0.878*** (0.259)	-1.180*** (0.259)
Inflation			-0.633* (0.318)	-0.675* (0.312)	-0.633 (0.420)	-0.675 (0.402)
Interest rate			0.702*** (0.178)	0.727*** (0.175)	0.702** (0.243)	0.727** (0.238)
GDP			-0.580** (0.182)	-0.545** (0.177)	-0.580** (0.209)	-0.545** (0.205)
_cons	21.52** (6.772)	22.76*** (6.791)	27.24*** (7.331)	31.31*** (7.414)	27.24*** (6.485)	31.31*** (6.663)
<i>N</i>	593	593	590	590	590	590
<i>R</i> ²	0.051	0.063	0.158	0.190	0.158	0.190

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.6 shows the two-stage least squares regression for board characteristics, insider ownership and non-performing loans. Model 1 contains only board characteristics variables which shows only board gender diversity as significant predictors of NPLs. In Model 2, insider ownership was introduced into the model, but it did not make any significant improvement in the coefficients of the variables expect a marginal increase in the R^2 . Model 3 contains the introduction of the control variables but without insider ownership. When insider ownership was introduced in Model 4, there is an improvement of the R^2 from 15.8% to 19% and average board age becoming significant at 90% confidence interval. The introduction of the control variables caused some of the independent variables significant in the model. Models 5 and 6 reports robust standard errors. There are no differences in the overall R^2 of the default and robust standard errors but an improvement in the significance of board independence and drops in the significance of average board age and interest rate. In all the models, the inclusion of insider ownership reduced the standard errors except for bank size and staggered boards.

6.7.4 Insider ownership and non-performing loans

The second hypothesis states that insider ownership reduces NPLs. The negative coefficient of insider ownership in all the models confirms this hypothesis. Mean insider ownership is 1.64% among European banks. Contrary to earlier studies which report non-linear relationship between insider ownership and firm performance (Gulamhussen et al., 2012), we find a linear negative relation. Insider ownership reduces potential moral hazards which lead to losses such as NPLs, high performance and reduced risk-taking behaviours (Andreou et al., 2017; Moro & Fink, 2013).

The third hypothesis states that board characteristics and insider ownership reduce bank NPLs. The study confirmed the third hypothesis. The inclusion of insider ownership improves the significance of board characteristics variables.

6.7.5 Robustness analysis

The inclusion of bank and country-specific variables is meant to control for certain latent inter-relations between board characteristics and managerial ownership which affect the level of NPLs. We went further to perform some sensitivity analyses by dividing the sample into diversified and non-diversified banks, compared means to find significant differences. We run 2SLS instrumental variable regression address endogeneity.

We analysed the sensitivity of diversified and non-diversified banks for the model. Board diversity ($p < 0.001$), average board age ($p < 0.05$), board size ($p < 0.05$) and board independence ($p < 0.1$) significantly associate with NPLs for non-diversified banks. For diversified banks, average board tenure and board size have significant negative relation with NPLs at 95% confidence interval. This is consistent with previous research that banks with diversified incomes have minimal market risk exposure (Leung et al., 2015). The inclusion of insider ownership in the model for non-diversified did not change the overall explanatory power of the independent variables (19%). However, the contrary is observed in the case of diversified banks (from 30% to 33%) even though there are fewer significant board characteristics variables as compared to non-diversified banks.

Table 6.7: 2SLS regression for diversified and non-diversified banks				
	(1)	(2)	(3)	(4)
	Non-diversified banks		Diversified banks	
	NPLs	NPLs	NPLs	NPLs
Staggered board	-7.036 (11.34)	-8.368 (11.58)	-1.221 (8.912)	-2.731 (9.479)
Average board age	0.455** (0.169)	0.437** (0.168)	-0.0164 (0.149)	0.00296 (0.150)
Board diversity	-9.712*** (2.136)	-9.609*** (2.187)	-2.579 (2.301)	-2.530 (2.402)
Average board tenure	-0.556 (0.410)	-0.457 (0.421)	-0.588** (0.228)	-0.640** (0.229)
Board independence	-0.880* (0.370)	-0.955* (0.379)	0.197 (0.571)	0.115 (0.569)
Board size	-0.591** (0.209)	-0.608** (0.210)	-0.550** (0.190)	-0.491** (0.169)
Bank size	-1.883*** (0.547)	-1.852*** (0.553)	0.177 (0.286)	-0.414 (0.269)
Inflation	-1.367* (0.695)	-1.350* (0.683)	-0.384 (0.401)	-0.387 (0.395)
Interest rate	0.161 (0.358)	0.181 (0.354)	1.442*** (0.284)	1.384*** (0.279)
GDP	-0.563* (0.282)	-0.515 (0.284)	-0.450 (0.367)	-0.514 (0.378)
Insider ownership		-0.308*** (0.0590)		-0.294*** (0.0775)
_cons	34.01** (12.66)	34.68** (12.74)	13.70 (9.937)	23.81* (11.43)
N	291	291	296	296
R-sq	0.190	0.189	0.299	0.332

Table 6.7 shows the 2SLS regression for diversified and non-diversified banks. A variable for diversification was constructed by expressing non-interest income as fraction over total income. Using the median value for diversification, we classified the data into diversified and non-diversified banks in a sensitivity analysis from the same data as explained in Table 5. For non-diversified banks, Model 1 represents the exclusion of insider ownership whilst Model 2 includes it. Models 3 and 4 report the exclusion and inclusion of insider ownership for diversified banks respectively. For non-diversified banks, intrinsic board characteristics (average age and board gender diversity) show significant ($p < 0.05$ and $p < 0.001$ respectively) relation with non-performing loans. some extrinsic board characteristics and control variables are significant with the dependent

variable. On the contrary, none of the intrinsic board characteristics is significant for diversified banks. Insider ownership improves the R^2 value for diversified banks but reduces it for non-diversified banks. Robust standard errors and R^2 results have been reported with the significance levels shown in stars. Bank size is negatively significant for non-diversified banks whilst interest rate is significantly positive for diversified banks.

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.7.6 Endogeneity analysis

Research in corporate governance especially board characteristics has not been devoid of the problems of endogeneity which has the potential to confound the results (Faleye, Hoitash, & Hoitash, 2011). Endogeneity may arise because of omitted variable bias, unobserved heterogeneity, simultaneity or reverse causality. Fundamentally, a consistency test of the OLS estimator is hypothesized that there is no correlation between the regressors and the error term given as $E(u|X) = 0$. In all the models, staggered boards was found not to be significantly related to NPLs which is contrary to what we hypothesized in the explanation of variables. Our suspicion is that there are some omitted variables whose inclusion in the model would have made staggered boards and other board characteristics significantly related to the outcome variable. Staggered boards silence shareholder voice and at times lead to managerial entrenchment. Such extremisms end up seriously affecting asset quality which impair firm value. Staggered or classified boards increase corporate opacity and information asymmetry (Duru, Wang, & Zhao, 2013) which blurs firm transparency, perpetuated board and managerial inefficiency thereby leading to loan losses. We assume that staggered board is endogenous to the level of non-performing loans because of its ability to weaken the monitoring and supervisory mechanisms of supervisory and managerial board. The reasons behind the adoption of staggered boards may result in reverse causality (Cremers, Litov, & Sepe, 2017).

To statistically test these suspicions, we performed a two-stage least squares with instrumental variable on the OLS results (Belkhir, 2006) for the baseline model. This was followed by post-estimation analyses to test for endogeneity. We introduced bank age as instrument for the endogenous role of staggered board. Instrumental variables should be exogenous and clearly mimic the regressors. Bank age does not in itself significantly affect NPLs but may explain other factors related to NPLs such as strong bank-client

relation, hiring of experienced staff and familiarity with the business environment. Older banks may enjoy certain advantages in the market or may have existing mechanisms to enhance board monitoring functions better than new banks.

In the first stage result, the instrumental variable shows significant relation with the endogenous variable (Model 2 of Table 6.8) thus justifying its choice for instrumentality. The second stage regresses the variables (which includes the instrumental variable, bank age) on the endogenous variable which is found in equation 4. The result is also seen in Model 2 of Table 6.8

$$StaggBod_{i,t} = \delta_0 + \delta_1 AvBoardAge_{i,t} + \delta_2 BodDiver_{i,t} + \delta_3 AvTenure_{i,t} + \delta_4 BodIndepen_{i,t} + \delta_5 BodSize_{i,t} + \delta_6 InsiderOwn_{i,t} + \delta_7 BankSize_{i,t} + \delta_8 Inflation_{i,t} + \delta_9 InterestRate_{i,t} + \delta_{10} GDP_{i,t} + \delta_{11} BankAge_{i,t} + \mu_{i,t} \quad \dots\dots\dots(4)$$

A new variable for the residuals was estimated and included in the structural equation for Model 3 of Table 6.8. The overall R² for this model is not too different from that of the structural equation. In the test of endogeneity, the result was found to be insignificant and therefore we reject the hypothesis that staggered board is exogenous. The 2SLS was run for Model 4 after dealing with the endogeneity issues. The post estimation tests of endogeneity were performed. The Wu-Hausman test shows there are no omitted variables or simultaneity. The Durbin-Wu-Hausman test compares the instrumental variable and OLS estimates to determine if there is sufficient evidence to conclude they are close. If they are, then there is insufficient evidence to reject the null hypothesis. The result (19.5984) is above the criterion (F=10) which confirms that the instrument is not weak. The partial R² confirms the relation between the instrumental and endogenous variables and very significant (p<0.001; from Model 2 of Table 6.8).

Table 6.8: Endogeneity test results				
	(1) <i>Baseline OLS</i> NPLs	(2) <i>1st stage regression</i> Staggered board	(3) <i>Residual</i> NPLs	(4) <i>2sls</i> NPLs
Average board age	0.229* (2.18)	-0.00363 (-0.86)	0.215* (2.03)	0.215* (1.99)
Board gender diversity	-7.127*** (-4.66)	0.193** (3.17)	-5.870** (-3.07)	-5.870** (-3.01)
Staggered	0.945		-5.158	-5.158

board	(0.93)		(-0.92)	(-0.90)
Average board tenure	-0.624** (-2.90)	0.00429 (0.50)	-0.597** (-2.75)	-0.597** (-2.70)
Board independence	-0.445 (-0.99)	-0.0406* (-2.26)	-0.650 (-1.34)	-0.650 (-1.32)
Board size	-0.574*** (-5.13)	-0.00141 (-0.31)	-0.585*** (-5.21)	-0.585*** (-5.11)
Insider ownership	-0.333*** (-5.79)	-0.00595** (-2.60)	-0.372*** (-5.51)	-0.372*** (-5.40)
Bank size	-1.075*** (-4.12)	-0.0154 (-1.48)	-1.180*** (-4.25)	-1.180*** (-4.16)
Inflation	-0.663* (-2.17)	-0.00166 (-0.14)	-0.675* (-2.21)	-0.675* (-2.17)
Interest rate	0.750*** (4.41)	0.00274 (0.39)	0.727*** (4.25)	0.727*** (4.16)
GDP	-0.493** (-2.95)	-0.00524 (-0.78)	-0.545** (-3.13)	-0.545** (-3.07)
Bank age		0.0648*** (4.43)		
Residual			6.310 (1.10)	
_cons	27.06*** (4.39)	0.469 (1.87)	31.31*** (4.31)	31.31*** (4.22)
<i>Chi-sq (1):</i>		<i>1.23787 (p=0.2659)</i>		
<i>Wu-Hausman F test:</i>		<i>1.21314 (p=0.2712)</i>		
<i>Endogeneity tests:</i>		<i>R-sq: 0.0786</i>		
		<i>Adjusted R-sq: 0.061</i>		
		<i>Partial R-sq: 0.033</i>		
<i>Durbin-Wu-Hausman Chi-sq test:</i>		<i>19.5984</i>		
<i>N</i>	590	590	590	590
<i>R</i> ²	0.237	0.079	0.239	0.190

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.7.7 Arellano-Bond GMM estimation of board characteristics, insider ownership and NPLs

Since the study used a panel data, we used a dynamic model to compute the Arellano and Bond GMM estimation using the model in equation 5.

$$\Delta NPL_{i,t} = \delta + NPL_{i,t,t-1} + \beta_1 BodXtics_{i,t} + \beta_2 InsiderOwn_{i,t} + \beta_3 Contr_{i,t} + \mu_i + \varepsilon_{i,t} \dots\dots\dots(5)$$

Where $NPL_{i,t}$ is the log of NPL for bank ‘i’ at the time ‘t’; μ_i is the bank-specific fixed effects, ε_i are time-varying error terms and $\beta_1, \beta_2, \beta_3$ are parameters to be estimated.

Our interest is the rate of change in NPLs and not the levels hence the lag of the dependent variable ($NPL_{i,t,t-1}$). This is to enable us determine the contribution of board characteristics and insider ownership variables to the rate of change in NPL levels.

We use the Hansen test because it is robust to autocorrelation and heteroscedasticity (Diaz-Serrano & Sackey, 2016). The result of the test shows that the χ^2 is not statistically significant hence confirming the validity of the instruments. The Arellano-Bond estimation for autocorrelation (AR1) and (AR2) shows that there is no serial correlation between the differenced variables used as instruments and the first differences of the residual. We follow Diaz-Serrano and Sackey to conclude that the instruments are good.

Table 6.9: Arellano-Bond GMM estimation	
Variable	(1) NPL _S _{t-1}
Average board age _{t-1}	0.188*** (0.068)
Average tenure _{t-1}	0.194 (0.184)
Board independence _{t-1}	-2.036 (1.818)
Board diversity _{t-1}	-3.484** (1.511)
Board size _{t-1}	-0.061 (0.061)
Insider ownership _{t-1}	-0.284* (0.165)
Constant	-7.734** (3.476)

Observations	506
Number of banks	97
Bank effect	YES
Hansen Test (stat.)	52.94
Test AR(1) (z-stat.)	-2.14
Test AR(2) (z-stat.)	-1.60

Table 6.9 shows the Arellano-Bond GMM estimation for board characteristics, insider ownership and non-performing loans. In the dynamic model, two stage estimation for the rate of change in NPLs is estimated to address the endogeneity problems. Using staggered boards as endogenous variable, the tests for the validity of instruments, autocorrelation and serial correlation satisfy specified assumptions for the Hansen test, AR(1) and AR(2) tests. The result shows statistical significance for the intrinsic board characteristics (average board age ($p < 0.01$) and board gender diversity ($p < 0.05$)) and insider ownership ($p < 0.1$).

6.7.8 Discussion

The focus of this study is to establish how board characteristics (gender diversity, average board age, average tenure, staggered boards, board independence, board size) and insider ownership affect NPLs in European banking. We find that board characteristics and insider ownership are complementary approaches used to minimize NPLs in banking. This is contrary to the findings of Belkhir (2006) who reported the two as substitutable to bank performance. Using them as substitutes does not provide a holistic approach to address the complex market failure of dealing with NPLs which can trigger financial crisis. The nature of bank risks is so dynamic, complex and multifaceted that the framework we propose alone is not enough to deal with it comprehensively. There are other parallel mechanisms for monitoring which add up to our findings such as board committees, internal and external audit, regulatory and supervisory bodies (Laeven & Levine, 2009; Upadhyay, Bhargava, & Faircloth, 2014; Xie, Davidson, Dadalt, Davidson Iii, & Dadalt, 2003).

Findings are consistent with Francis, Hasan, Koetter, and Wu (2012); who reported significant relation between board characteristics and bank loan contracting. Normatively, board of directors are accountable to the firm and investors seem to find it acceptable to pay for the value created by good governance. Board members have individual and collective responsibilities hence the need to consider variables that describe individual intrinsic characteristics (board age and gender) and group extrinsic

variables (staggered board, board tenure, board independence and board size). We find confirmation for the negative relation between board characteristics and non-performing loans (Tarchouna et al., 2017). The application of effective governance principles such as transparency and accountability enhances effective monitoring which in turn reduces the creation loans that have potential to go bad. Good governance creates value by safeguarding assets not only for shareholders but also other indirect interest groups.

Contrary to earlier research that finds board gender diversity to increase portfolio risk (Berger, Kick, & Schaeck, 2014), we report that the inclusion of females on bank boards reduces NPLs. Women are conservative, risk averse and cautious with risk-taking (Fauzi, Basyith, & Ho, 2017). Owen and Temesvary (2018) found that most women appointed on boards are cautiously selected, have higher education, well-qualified, experienced and bring to the board some innovativeness which positively affect performance. The negative relation between gender diversity and NPLs reported in this study can be attributable to some of the reasons outlined in prior research. Our result provides empirical support and justification for the European Parliament's new directive for companies in member countries to have at least 40% female representation on company non-executive boards (European Commission, 2012). The resource dependency theory emphasizes a multicultural approach of harnessing human capital, skills and competencies from diverse sources to create added value to the firm (Doldor et al., 2012; Liu et al., 2014) by reducing NPLs. The relevance of female representation on board of directors of banks is not only peculiar to Europe where we studied but has been confirmed in major economies like China, the US other OECD countries (Farg & Mallin, 2017; Gulamhussen & Santa, 2015; Liu et al., 2014; Muller-Kahle & Lewellyn, 2011).

Board members have heterogeneous age distribution, which can explain a balanced attitude towards risk. Usually, risk appetite is lower for the old than the young board members (Switzer & Wang, 2013) and we believe from our study that an age range between 40s and 70s is a good mix for sound board performance. Unlike previous studies which found no significant relation between board age and performance (Byrd et al., 2010) and negative relation with financial performance (Talavera et al., 2018), we report a positive relation between average board age and NPLs. It means that as board age increases, credit risk exposure gets high. This is consistent with Switzer and Wang (2013).

In this paper, we found significant negative relation between board size and board average tenure on NPLs. The choice of appropriate board composition by way of size (mean=12) improves the monitoring function and other roles and responsibilities (Himaj, 2014; Pathan, 2009). Our findings confirm existing empirical research that bank risks reduce with board size (Armeanu et al., 2017; Nakano & Nguyen, 2012; Pathan, 2009). This is because large board size might slow down deliberations and decision-making whilst small size might be over-burdened with multiple tasks which might render them ineffective. On the contrary, firms seem to enjoy from the rich expertise of large boards as they bring their resources on board. We agree with earlier research which found non-linear relationship (de Andres & Vallelado, 2008) between board size and performance but also report a linear relation in our current work. With mean tenure of 5years, board of directors will be capable of executing all relevant policies and will be well informed enough to monitor managerial misbehaviour. However, as reported by a study in the US, the danger of board members aligning with management against the principal (shareholders) is likely to occur for boards whose tenure is high (Muller-Kahle & Lewellyn, 2011). We confirm that board tenure is effective in the oversight of management against loan losses (Harjoto et al., 2018). Board independence is significant in the robust baseline OLS regression. Shareholders and potential investors have confidence in the monitoring capabilities of independent board members and this is a value addition to the firm. Staggered boards have negative relation with NPLs but not significant.

The study found that, insider ownership significantly reduce NPLs in European banking. In all the models, its inclusion improved by reducing the standard errors and significance levels of not only some individual board characteristics but also the overall model. Insider ownership improved the significance level of average board age, board independence and some macroeconomic control variables in the model. Consistent with the agency theory, managerial opportunism is minimized when they are made part-owners (Fama & Jensen, 1983; Hagedorff et al., 2010). In the case of (Belkhir, 2006), when insider ownership and board characteristics were included in a model, the former lost its significance hence his conclusion that the two should be seen as substitutes. Our study finds the exact opposite where the two should be complementary to effective board monitoring. Other research had reported no relation between managerial ownership and bank risk (Chun et al., 2011) or non-linear relation (Gulamhussen et al., 2012). The negative relation reported

between insider ownership and NPLs is a confirmation of how moral hazards in management which lead to mistrust and asset losses could be curbed by insider ownership (Andreou et al., 2017; Moro & Fink, 2013; D. Zhang et al., 2016).

For the control variables, bank size shows consistent inverse relation with NPLs. As banks increase its size, it is expected that more effective monitoring mechanisms are put in place to check loan losses. The significance of bank size is not only reported in the main models but also among non-diversified banks who rely heavily on interest incomes. All the macroeconomic variables interest rate GDP and inflation are significant. Inflation and GDP reduce NPLs whilst interest rate is positively related.

We report significant differences in the NPLs, average board age, insider ownership and bank size (all at 99% confidence interval). Board gender diversity and board size are also significant at 95% confidence interval from the t-test results. All the intrinsic board characteristics are statistically significant, and this confirms our classification criteria that intrinsic characteristics are individual-related and align to individual differences (Dalton & Dalton, 2011). Apart from board size, all other extrinsic characteristics are not statistically different because of the group belongingness (Marshal & Weatherson, 2018). Diversified banks have less reliance on interest incomes hence less NPLs as compared to non-diversified ones. Our study finds support for this assertion in literature thus confirming previous research that banks with diversified models have minimal risk (Fosu, Ntim, Coffie, & Murinde, 2017). It must however be noted that when banks are highly diversified, they become opaque, risk-loving and therefore exacerbate the moral hazards emphasized by the agency theory. In an environment where there is abuse of a staggered board system (Aguilera, 2005; Bebchuk & Cohen, 2005), managerial entrenchment becomes inevitable and may lead to high losses. The inclusion of insider ownership in the model shows relevance for diversified banks (from the R^2 values) than its exclusion. This supports the hypothesis and existing research that complementing board monitoring with managerial incentives maximizes the risk management function.

6.8 Conclusions

We examined the relation between board characteristics, insider ownership and non-performing loans in European banking. We introduced the first classification of board characteristics into intrinsic and extrinsic boards where the former covers individual-based characteristics and the latter on board collectiveness. The intrinsic characteristics depict board diversity whilst the extrinsic component covers the structure, composition and functioning of boards. The study tested and justified the inclusion of insider ownership as complement to effective board monitoring to reduce NPLs. Boards of European banks enjoy diversity economies due to the heterogeneous board age and female representation. This has the capacity to create meaningful board discussions, which will create value for shareholders and other stakeholders in their effort to monitor managerial opportunism. Our findings have strong support from the stakeholder, resource dependency and agency theories. This research supports recent laws, policies and directives by the European Parliament, European Central Bank and bank supervisory authorities to address the debilitating NPLs issues in the financial services industry.

The study confirms earlier research which sees board composition (in this case characteristics) and ownership as complementary instead of substitutable governance mechanisms (Sur et al., 2013). Moral hazards exist in the credit cycle from the initiation through the monitoring to the retirement of loans. This is better addressed through managerial incentives such as insider ownership. The inclusion of insider ownership to board characteristics variables improves the relationship with bank NPL than when the former is excluded. Specifically, average board age, board gender diversity, board independence, average board tenure and insider ownership have significant negative relation with non-performing loans. However, average board age has significant positive relation with NPLs. Board characteristics and insider ownership reduce non-performing loans and therefore create value. The control variables (bank size, inflation, interest rate and GDP) are significantly related NPLs. It is not to say that board characteristics and insider ownership provide exhaustive framework for controlling banks' managerial behaviour but also external governance systems such as the role of external auditors and regulation can help to protect and create value for stakeholders.

6.9 Theoretical implications

The findings from this study conform to the stakeholder and agency theories. Board of directors through their characteristics such as average age, gender diversity, average tenure, independence and board size significantly reduce bank non-performing loans. The stakeholder theory emphasizes protection of all stakeholder interests and not only shareholders. The devastating effect of NPLs goes beyond only shareholders and such holistic approach has the tendency to minimize conflict of interest. The complementary role of insider ownership to board characteristics better reduces moral hazards explained by the agency problem. The human factors related to high NPLs can be addressed by making executives part owners of the firm so that they will have a duty to safeguard the assets of investors.

6.10 Practical implications

Non-performing loans continue to hamper the development of financial markets in emerging and major economies. Our study provides a diversified approach to ameliorating this obstacle to complement regulatory and prudential directives from banking authorities. The paper contributes to public policy on bank governance not only in Europe but other national and regional blocks. The directive by the European Parliament to enforce mandatory 40% female representation on non-executive boards has been given relevance in this study. Our research contributes to the ongoing debate on the female quota on company boards and can serve as reference document to back this directive proposed.

In practice, the study provides a reliable framework for recruiting or engaging people to serve on boards. It is important to consider individual intrinsic characteristics that will help create for the organization by looking at the age, gender diversity and other intrinsic attributes of the individual to maximize firm value. The individual must be appointed to serve on the board if he/she possess the characteristics shareholders place much premium.

6.11 Limitations

The limitations to the study include non-availability of data for all banks for the period of study and beyond. This is a post-crisis period study; it would have been more appropriate if the period prior to the global financial crisis had been captured in the sample. We had this in mind but data was not available. There was inconsistency in the reported variables from different databases. Using data from various sources may suffer from such inconsistencies and non-standardization of metrics but it is also a confirmatory approach to credible and reliable data. We addressed this problem by confirmation from bank annual and corporate governance reports. Again, the sample is not very even, because some countries were lowly represented. It is against this background that we run diagnostic, sensitivity and robustness analyses. In spite of these limitations, the methodology is consistent with existing research and all assumptions and diagnostic tests passed statistically tests. These limitations cast no doubts about the findings of our study.

6.12 Future research

Future research could compare the pre and post-crises periods and consider how board monitoring and managerial incentives improve the value of the firm.

6.13 References

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CHAPTER SEVEN

GLOBAL DISCUSSION OF RESULTS

7.1 Introduction

This chapter covers a global discussion of the results of the four essays in the context of the internal governance framework. The discussion begins with the various forms of loan outcomes such as default, non-performing loans and eventual credit risk and the factors, which cause them. It is then followed by how internal governance mechanisms such as internal controls, board controls and managerial incentives address credit risks.

7.2 Discussions

Loan default is a global problem in the financial intermediation function of financial institutions. There is a regulatory lacuna existing in the banking industry at the national, regional and international levels (Bakir & Woo, 2016; Weber, 2010). This has created concerns to regulatory bodies, policy makers and researchers because, market participants will always exploit the loopholes in the system at the least opportunity especially during financial intermediation. The credit creation process brings about outcomes such as delay in repayment, default, loan restructuring, non-performing loans and eventual credit risk which affects the entire financial system. Such outcomes hinder the smooth running especially the financing of bank-based economies and may result in financial crisis. The sustainability of a resilient functioning and reliable banking environment rests on internal governance mechanisms.

The causes of loan default are usually borrower-led, loan characteristics, lender-caused or causes as a result of uncontrollable industry and environmental factors. Loan default caused by ownership characteristics especially sole proprietors are as a result of their inability to maintain formal corporate governance practices. The specific factors found to increase the probability of default include multiple borrowing, diversion of loan purpose, loan price, loan age, repayment plan and underfunding. Consistent with earlier research conducted in Europe, Salas and Saurina (2002) studied the period 1985-1997 and focused on commercial and savings banks. Salas and Saurina (2002) reported that ownership characteristics, lender, industry and macroeconomic factors are critical factors that predicted the probability of default. Further studies in Spain by Serrano, Mirralles, and

Manuel (2014) covered the financial crisis period (2004-2013) saw the introduction of hedging derivatives as internal variable and external variables such as unemployment, housing prices and the number of companies declaring bankruptcy. Chakrabarti and Zeaiter (2014) did a cross-country study on sovereign default from 1970-2010 using extreme bound analysis and found that, credit worthiness, inflation, growth, debt service ratio, corruption, reserves, exchange rate, loan price determine default probability.

Global trends for determinants of loan default shows that, factors with significant effect on the probability of default depends on the kind of loan product being studied (consumer loans, business loans, or derivatives). The scope and level of the study also determines the effect of macroeconomic indicators on the probability of loan default. The interconnectedness of debt instruments and repayment decisions within the financial markets account for the similarities in the factors, which provide justification for studying all these range of credit products together. Within the framework of internal governance, bank managers have the duty of carefully appraising loan products taking into consideration the borrower characteristics, loan characteristics, lender characteristics and other macroeconomic indicators that affect the loans.

Ali, Liu and Su (2018) reported in their study in Australia that, well-governed firms have lower probability of default. Internal governance as presented in this thesis includes internal control mechanisms, board monitoring functions and managerial incentives. These mechanisms can effectively minimize the probability of loan default.

Various frameworks for internal control mechanism have been adopted by countries or industry players to ensure safeguarding assets and maintaining investor confidence and value creation. Among such frameworks are the COSO and Basel Committee on Banking Supervision internal control frameworks. Both frameworks have similarities on the elements and objectives of internal control systems even though the latter is specific to banks. It is not uncommon to find the existence of internal control mechanisms in most banking institutions but there is no guarantee for their effectiveness. Such situations expose banks to serious credit risk vulnerabilities. There is significant effect of the elements of internal controls on credit risk especially the control environment, risk management, control activities and monitoring. Financial expertise of board members

enables them understand and advice on risky decisions but at the same time increases the risk appetite of banks on which they serve (Minton, Taillard, & Williamson, 2011).

Within the European Union countries, it is not mandatory for banks to disclose material internal weakness. The non-disclosure of material internal control weakness is a contributory factor to breakdowns in internal control systems which exacerbate fraudulent actions bank staff (Baker, Cohanier, & Leo, 2017). The issue of non-disclosure impairs the credibility and efficiency of board of directors and the firm's socially responsible behaviour (Miras-Rodríguez & Di Pietra, 2018). There is however a perceived board ineffectiveness in the current study among European banks, which does not augur well for effective internal control systems. In the US, Kim et al. (2011) reported that loan spreads were higher for firms with internal control weakness than those without internal control weakness. Thus, the effectiveness of internal controls determined loan pricing because evidence of internal control weakness increases the risk profile of such firms. More evidence was given by Ge, Kim and Song (2012) whose study on non-US firms found that, banks charge lower loan rates, offer larger and longer-maturity loans, and impose fewer restrictive covenants to better-governed firms. In a qualitative study in Italy, Cerrone (2014) maintains that internal control mechanisms are effective for bank risk management and provides safe and sound management capable of achieving the goals of the bank. Chen, Dong, Han, et al. (2013) found that effective internal control system ensures good financial reporting and increases the confidence of investors on the capital market. Investor confidence is very critical for countries that suffered severely from the global financial crisis. In environments where there is perceived board ineffectiveness and non-disclosure of material internal control weakness, it is difficult to guarantee for effective internal control measures. Perhaps this could explain the confirmation of the agency problem reported in this study.

Internal control systems are perceived to be effective if the objectives of internal controls are achieved. The objectives of the COSO and Basel internal control frameworks are performance objectives, reporting objectives and compliance objectives (Basel Committee on Banking Supervision, 2010; McNally, 2013). Another way of looking at internal control effectiveness is the structure and firm-specific conditions thus making the effectiveness of internal control contingent on the firm (Jokipii, 2010) and a typology that does not rely only on reporting material internal control weakness (Lansiluoto et al.,

2016). In the current study, the result shows effective internal control systems because the objectives of the internal controls framework were achieved and they have significant effect on credit risk. However, the proxy variable used for agency problem (institutional ownership) showed significantly weak positive relation with credit risk therefore revealing the existence of perceived agency problem. These findings contrast earlier research (Himaj, 2014; Lee & Chung, 2016; Meckling, 1976; Zhang & Cao, 2016) and the hypothesis that effective internal controls reduce the agency problem. Agency problem may exist in the form of managerial entrenchment.

Using data of Chinese listed firms from 2009-2012, Xu and Zhou (2015) report that the concentration of managerial power mediates the relationship between internal controls and credit risk. Xu and Zhou (2015) posit that the relationship is a curvilinear type, which indicates that initially, concentration of managerial power increases effectiveness of internal controls, which further minimizes credit risk but later beyond an optimal point, the returns is negative. Cho and Chung (2016) found that firms with internal control weakness report high provision for loan losses, which increases the credit risk exposure of commercial banks. Cho and Chung (2016) added that, anytime banks put in place remedial measures to correct internal control weakness, loan losses and provision for loan losses reduced. Other variables such as firm size and macroeconomic indicators like GDP, inflation and interest rates affect internal controls and credit risk. On firm size, it is known that smaller banks have disincentive to enforce internal control mechanisms (Ashbaugh-Skaife et al., 2007) as compared to larger ones. There is reason to agree that macroeconomic environment has significant relation with credit risk within a country (Jakub, 2007). The findings complement quantitative non-governance mechanisms of managing bank risks in Europe.

In the conceptual framework for this thesis, apart from internal controls, internal governance has the board monitoring and insider ownership aspects which affect credit risk. The study measures board monitoring by a novelty classification into intrinsic and extrinsic board characteristics. The results show that whilst gender diversity, board size and insider ownership have negative relation with NPLs, average board age and board tenure show positive relation. The inclusion of insider ownership improves the significance of board characteristics therefore confirming a complementary instead of substitutable approaches in addressing bank risks. The thesis uses insider (managerial)

ownership to address the agency problem. This approach takes a different perspective from the work of Courteau, Di Pietra, Giudici, and Melis (2017). Controlling shareholder behaviour addresses Types I and II agency costs whilst at the same time ensuring effective corporate governance practices (Courteau et al., 2017). The findings from this thesis on the role of insider ownership in addressing the agency problem complements the work of Courteau et al. (2017) for a more holistic approach to the agency problem.

The findings about the presence of females on boards of firms are either positive or negative. Prior research shows that, board gender diversity increases portfolio risk (Berger et al., 2014), but the current study reports that the inclusion of females on bank boards reduce NPLs. Probably the explanation to this inverse relation was provided in a study in Indonesia which reported that women are conservative, risk averse and cautious with risk-taking (Fauzi et al., 2017). Further research in the United States on 168 banks by Owen and Temesvary (2018) found that most women appointed on boards are cautiously selected, they have higher education, well-qualified, experienced and bring to the board some innovativeness which positively affect performance. The European Parliament issued a directive for the inclusion of at least 40% females to serve as non-executive board members (European Commission, 2012) and this provision has found confirmation and justification in this study.

Consistently, insider ownership improved the relationship between board characteristics and NPLs. Switzer et al. (2018) classified insider ownership, board composition and other variables under internal governance in their study of 28 countries outside North America in a post-crisis study. The authors report significant relationship between insider ownership and board composition on default risk. Switzer et al. (2018) report higher impact on default risk in Asian than European countries.

Effective internal governance minimizes the agency problem, maximizes firm value and possibly require little external governance by investors (Acharya, Myers, & Rajan, 2011). Key to effective internal governance is an intrinsic desire of executives to create value by their commitment to designed mechanisms to minimize losses and all kinds of entrenched self-interests. Effective internal governance does not only minimize bank risks but also decreases takeover exposures (Lee & Chung, 2016). Internal governance systems increase firm value, investor confidence and longevity of firms. The results from all the four essays

provide theoretical support for the agency theory. It goes to suggest that internal governance mechanisms are effective for reducing the agency problem.

CHAPTER EIGHT

FINAL CONCLUSIONS

This thesis sought to investigate the determinants of loan default, determine the effect of internal controls on credit risk, analyse the effectiveness of internal controls as mechanism for managing credit risk. The study also analysed how board characteristics and insider ownership (as mechanism for managerial incentives) affect non-performing loans in European banking. The main research design employed was the quantitative type. The study used primary data and secondary (panel) data from 2008-2014 and the estimation models were logistic regression, generalized least squares regressions (fixed and random effects), two-stage least squares instrumental variables estimation and generalized method of moments. Several post-estimation techniques, diagnostic tests and robustness checks were performed.

The study concludes that, factors leading to business loan default falls under the categories of ownership characteristics, borrower characteristics, loan characteristics, lender characteristics and macroeconomic factors. Specifically, factors, which increase the probability of business loan default, include owner's extra income, size of business, multiple borrowing, diversion of purpose, purpose of loan, age of loan, repayment plan, loan price and underfunding. Apart from quantitative credit scoring approaches to loan appraisal, financial intermediaries need to be wary of these factors since they exacerbate the probability of default leading to credit risk especially in emerging economies.

From the findings of the thesis, we conclude that internal control mechanisms exist in banks but there is no guarantee for the effectiveness of these measures especially in banks where there is no mandatory reporting of material internal control weakness. There is significant effect of internal controls on credit risk. The elements of internal controls, which significantly affect credit risk, are the control environment, risk management, control activities and monitoring. The study confirms the existence of the agency problem (with independent board members) among listed banks in Spain. Internal controls do not only address operational risk but also credit risk.

We conclude that there are effective internal control systems among banks in Europe because the objectives of operational performance and compliance were achieved through internal control mechanisms. However, subtle conflict of interest exists because of suspicion for the existence of the agency problem. Internal control elements, objectives, agency problem, bank and country characteristics significantly affect credit risk. The revised COSO framework for internal controls provides a comprehensive approach to dealing with loss of assets. It is however not exhaustive but could be complemented with specific approaches to minimizing the agency problem.

The study introduces a novelty classification of board characteristics into intrinsic and extrinsic characteristics. The intrinsic characteristics depict board diversity whilst the extrinsic component covers the structure, composition and functioning of boards. The study tested and justified the inclusion of insider ownership as complement to effective board monitoring to reduce NPLs. Boards of European banks enjoy diversity economies due to the heterogeneous board age and female representation. This has the capacity to create meaningful board discussions, which will create value for shareholders and other stakeholders in their effort to monitor managerial opportunism. This research supports recent laws, policies and directives by the European Parliament, European Central Bank and bank supervisory authorities to address the debilitating NPLs issues in the financial services industry.

The study confirms earlier research which sees board composition (in this case characteristics) and ownership as complementary instead of substitutable governance mechanisms (Sur et al., 2013). It is informative for managers and board of directors to note from this study that, moral hazards existing in the credit cycle (from the initiation through the monitoring to the retirement of loans) can be minimized through managerial incentives such as insider ownership. The inclusion of insider ownership to board characteristics variables improves the relationship with bank NPL than otherwise. Specifically, average board age, board gender diversity, board independence, average board tenure and insider ownership have significant negative relation with non-performing loans whereas average board age is significantly positive. The study provides eye-opener for regulators to see internal controls as effective for controlling credit risks.

This comes as innovative way of maximizing the benefits of internal controls which has previously been used to address operational risk issues.

All the four essays explain and confirm the agency theory. Ownership characteristics, bank-specific factors, loan characteristics, borrower, lender and macroeconomic factors are significant determinants of business loan default in emerging economies. There is significant effect of bank internal governance on credit risk. Aspects of internal governance, which significantly affect credit risk, are internal controls, board characteristics and insider ownership. Managerial incentives enhance the efficiency of board of directors' monitoring function. Internal control frameworks effectively reduce not only operational risks but credit risks as well. However, internal governance mechanisms do not provide stand-alone effective risk control measures but by complementing with external governance systems such as the role of external auditors and regulation to protect and create value for stakeholders.

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APPENDICES

APPENDIX 1: LIST OF SPANISH BANKS USED IN SECOND PAPER

CaixaBank, SA

Liberbank, SA

Banco Santander SA

Bankinter SA

Bankia, SA

Banco Popular Español SA

Banco Bilbao Vizcaya Argentaria, SA

Banco de Sabadell, SA

APPENDIX 2: LIST OF EUROPEAN BANKS USED IN THIRD AND FOURTH PAPERS

BANK	COUNTRY
Oberbank AG	Austria
Erste Group Bank AG	Austria
Bulgarian American Credit Bank AD	Bulgaria
Privredna Banka Zagreb d.d.	Croatia
Jadranska banka d.d. Šibenik	Croatia
Hellenic Bank Public Company Limited	Cyprus
Bank of Cyprus Public Company Limited	Cyprus
Komerční banka, a.s.	Czech
Totalbanken A/S	Denmark
Vestjysk Bank A/S	Denmark
Sydbank A/S	Denmark
Spar Nord Bank A/S	Denmark
Skjern Bank A/S	Denmark
Ringkjøbing Landbobank A/S	Denmark
Salling Bank A/S	Denmark
Østjysk Bank A/S	Denmark
Nordfyns Bank A/S	Denmark
Nordjyske Bank A/S	Denmark
Lån & Spar Bank A/S	Denmark
Kreditbanken A/S	Denmark
Jyske Bank A/S	Denmark
Jutlander Bank A/S	Denmark
Hvidbjerg Bank A/S	Denmark
Djurslands Bank A/S	Denmark
Fynske Bank A/S	Denmark
Danske Bank A/S	Denmark
Ålandsbanken Abp	Finland
Aktia Bank Plc	Finland
Natixis	France

DVB Bank SE	France
BNP Paribas SA	France
Crédit Industriel et Commercial	France
Deutsche Bank AG	Germany
Aareal Bank AG	Germany
HSBC Trinkaus & Burkhardt AG	Germany
Deutsche Postbank AG	Germany
Deutsche Pfandbriefbank AG	Germany
IKB Deutsche Industriebank AG	Germany
Piraeus Bank SA	Greece
National Bank of Greece SA	Greece
Attica Bank SA	Greece
Alpha Bank AE	Greece
Eurobank Ergasias SA	Greece
FHB Jelzalogbank Nyrt	Hungary
OTP Bank Nyrt	Hungary
Bank of Ireland	Ireland
Permanent TSB Group Holdings Plc	Ireland
Allied Irish Banks, Plc	Ireland
Mediobanca - Banca di Credito Finanziario SpA	Italy
Banca Popolare di Sondrio SCpA	Italy
Intesa Sanpaolo SpA	Italy
Banca Popolare di Milano Scarl	Italy
Banca Finnat Euramerica SpA	Italy
Banco di Desio e della Brianza SpA	Italy
Credito Valtellinese Società Cooperativa	Italy
Banca Monte dei Paschi di Siena SpA	Italy
Credito Emiliano SpA	Italy
Banco Popolare Società Cooperativa	Italy
Unione di Banche Italiane SCpA	Italy
FinecoBank SpA	Italy
Banca popolare dell'Emilia Romagna SC	Italy

UniCredit SpA	Italy
Banca Carige SpA - Cassa di Risparmio di Genova e Imperia	Italy
Komercijalna banka AD Skopje	Macedonia
Bank of Valletta Plc	Malta
Van Lanschot NV	Netherlands
ING Bank Śląski SA	Poland
mBank SA	Poland
Powszechna Kasa Oszczędności Bank Polski SA	Poland
Bank Millennium SA	Poland
Bank Polska Kasa Opieki SA	Poland
Bank Zachodni WBK SA	Poland
Bank Handlowy w Warszawie SA	Poland
Bank BGŻ BNP Paribas SA	Poland
Getin Holding SA	Poland
Alior Bank SA	Poland
Banco BPI SA	Portugal
Banco Comercial Português SA	Portugal
Banca Transilvania SA	Romania
Banca Comerciala Carpatica SA	Romania
Všeobecná úverová banka, a.s.	Slovakia
Tatra banka, a.s.	Slovakia
CaixaBank, SA	Spain
Liberbank, SA	Spain
Banco Santander SA	Spain
Bankinter SA	Spain
Bankia, SA	Spain
Banco Popular Español SA	Spain
Banco Bilbao Vizcaya Argentaria, SA	Spain
Banco de Sabadell, SA	Spain
Swedbank AB	Sweden
Svenska Handelsbanken AB	Sweden
Skandinaviska Enskilda Banken AB	Sweden

Close Brothers Group Plc	UK
Barclays Plc	UK
HSBC Holdings Plc	UK
Royal Bank of Scotland Group Plc	UK
Lloyds Banking Group Plc	UK