Impact of Intracontinental Cross-Border Banking in Sub-Saharan Africa

Nishal Vallabh

A proposal for research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2017

ABSTRACT

Banks are deemed systemically important for the financial inclusion and economic development of the African Continent (Banker, 2016). Cross-border banking can accelerate the development of the banking sector and in Africa, intra-continental cross-border banking is being encouraged for the benefits it is believed to provide. The literature is inconclusive as to whether cross-border banking is beneficial and there is limited information on the advantages of intracontinental cross-border banking in Africa. Governments and regulators have been promoting this model, but they might be wrong. The purpose of this research was to determine whether intracontinental cross-border banking is more productive and beneficial to the banking industries within sub-Saharan Africa when compared to intercontinental cross-border banking. Secondary data was sourced from the Orbis database which is owned by Bureau van Djik. Countries were grouped into three categories which are:

Countries that only have domestic banks and intracontinental cross-border banks
Countries that only have domestic banks and intercontinental cross-border banks
Countries that have domestic banks, intracontinental cross-border banks and intercontinental cross-border banks

Appropriate financial measures were identified and a mean difference test was applied to the various groups to determine if intracontinental banks are more efficient, result in lower fragility, lead to greater competition, as well as intermediation. Although the literature by Beck (2015), Enoch et al. (2015) and Witte (2014) are supporters of cross-border banking and in particular, intercontinental cross-border banking in terms of the competition, efficiencies and financial stability it introduces, this paper finds no conclusive evidence that intracontinental is more beneficial to Sub-Saharan Africa, based on the financial information which was measured and the data that was used.

DECLARATION

I, Nishal Vallabh, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

_____

Nishal Vallabh

Signed at ……

On the …… day of …… 2017

DEDICATION

This report is dedicated to my wife, Khushboo, who offered tremendous love and support throughout my MBA journey, as well as to my parents, for instilling in me a strong sense of drive and achievement.

To my unborn child, may your life be guided by an everlasting sense of curiosity and desire to continuously grow as a person.

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Professor Kalu Ojah, for his support and guidance throughout my dissertation process.

Anton Lückhoff, from the Bureau van Djik offices in Johannesburg was extremely obliging and gave me access to the database which was helpful and for which I am thankful.

Hennie Gerber assisted with the statistical analysis and I would like to thank him for his patience, professionalism and the comprehensive output that he produced.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this study is to assess and analyse the effect of cross-border banking on Sub-Saharan Africa.

This study will evaluate key performance and control measures used in the banking industry in order to determine whether intracontinental cross-border banking is productive and beneficial to the banking industries in which they operate.

1.2 Context of the study

Financial development is important because well-established financial markets allow easier access to funding and diminish a firm's dependence on lenders. It can also lead to relaxed financial constraints and contribute to real growth in the economy. Foreign banks are seen to have a favourable impact on the financial sector which is important to any economy in driving growth (Kodongo, Natto, & Biekpe, 2014).

The last two decades have seen an unprecedented increase in globalisation with cross-border bank flows increasing dramatically, as well as banks having ventured abroad and established operations in other countries. Being predominantly state-owned in the 1980s, these entities were swamped with restrictive regulations, including interest rate ceilings and credit quotas. Financial liberalisation, globalisation, regulatory and institutional improvements have changed the face of financial systems across the continent (Beck & Cull, 2013). Governments are adopting a friendlier and more active approach in helping to create and attract other banks into their markets (Mugimba, 2015). Due to its colonialist past, African banks have traditionally had a high presence of foreign

banks. Recently though, banking systems in Africa have noticed profound structural changes with the increase in cross-border banks. African banks have become economically significant outside of their home countries and are being considered major players in their host countries (Léon, 2016). Cross-border banking can be thought of as expanding beyond one's home country into one or more host countries.

Africa has enormous variations in its financial systems, although most countries have deep, stable and resilient financial systems. South Africa and Mauritius are at one end of the scale with developed banking systems and capital markets while South Sudan and Central African Republic are the other end with very few financial services, limited product offerings and an extremely underdeveloped financial industry (Beck & Cull, 2013).

There is significant debate regarding the role of foreign banks in developing countries and arguments range from the ability to increase lending capacity in markets, to introduce their know-how and expertise which spills over to domestic banks in the increase in efficiencies of financial intermediation (Podpiera & Čihák, 2005).

Some African countries are big exporters of foreign banks like South Africa, Kenya, Morocco and Nigeria. The new entrants want to reap the benefits of the high economic growth rates expected on the continent, the rise of the middle class as well as the potential of reaching the large unbanked populations of which, according to the Global Findex database in 2014 only 34% of adults age 15 and older, were banked in Africa compared to the global average of 62% (Global Findex, 2016).

Due to the small economies and low levels of financial intermediation, Africa has a lot to gain from cross-border banking through the use of technology and efficiency gains. Cross-border banking can cultivate a more stable, efficient, financial inclusive, sophisticated banking system in sub-Saharan Africa. On the

other hand, cross-border banking can introduce numerous challenges to the region such as contagion risk, supervisory and regulatory risks.

Despite the increasing relevance of this topic, there is still a lack of understanding of the benefit and risks as well as a gap in the current research on the effects of intracontinental cross-border banking. This report fills some of these gaps.

1.3 Problem statement

The literature is inconclusive as to the benefits of cross-border banking and some of the findings were that cross-border banking does not lead to greater financial intermediation, improved efficiencies or increased competition. There has been a great deal of optimism around the launch of intracontinental cross-border banking in Africa. Governments and regulators have been investing valuable resources and setting up costly structures to support this model, but they might be wrong. Therefore, we need to know whether intracontinental cross-border banking is productive and beneficial to the banking industries within Africa.

1.4 Significance of the study

Banks are deemed systemically important for the financial inclusion and economic development of the African continent (Banker, 2016). A robust and efficient financial sector is at the heart of a strong economy and is a requirement and has a direct impact on a country's economic prospects (Bruno & Hauswald, 2013).

There are various arguments for and against cross-border banking and the benefits are often dependent on the region being studied. The research investigates the extent and effect that intracontinental cross-border banking has on intermediation and fragility on the banking sectors in the Sub-Saharan Region. Specific countries are assessed and bank performance is analysed. The report goes further to compare the fragility and performance of the various banking industries comprising domestic banks, intracontinental cross-border banks,

intercontinental cross-border banks, as well as industries that have a mix of these banks.

The study provides guidance as to whether intracontinental cross-banking is effective and whether governments and supervisory bodies should continue to develop policies and frameworks to encourage this form of bank expansion in this region. Although there is a fair amount of research on cross-border banking, research focused specifically on Africa, especially when focusing on intracontinental cross-border banking is extremely limited.

1.5 Delimitations of the study

The research topic is limited to the following:

Market sector: Financial Sector
Organisational type: Private
Company Type: Banks
Methodology: Quantitative
Geographical area: Sub-Saharan Africa

1.6 Definition of terms

Intermediation – in this paper, it relates to the bank's ability to match its ability to lend to that of the savings that it receives through deposits
Cross-Border Banking – it is the expansion of a bank's operations beyond its home country into one or more host countries
Intracontinental Cross-border banking – expansion of a bank within the continent to a new country or region.
Intercontinental Cross-border banking - expansion of a bank into a foreign or new continent
Cream-skimming – refers to the practice of a bank focusing on high quality or high-profit clients while disregarding clients who are less profitable

Contagion risk – it is the spread of a market changes or shocks from one region to another

Fragility - financial system’s susceptibility to large-scale financial crises caused by small routine shocks

1.7 Assumptions

The total number of banks observed is adequate to arrive at a reasonable conclusion as too few observations would have resulted in inappropriate data modelling.

The data sources used could be relied on and the data integrity is of an acceptable standard.

The performance measure used could be relied on and is sufficient to make the necessay findings.

2 CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

A well-functioning financial sector is vital for economic growth and development. The economic performance of a country is highly dependent on its level of financial development. Foreign banks ease the financial constraints on host economies and boost real growth. A greater presence of foreign banks reduces the financial dependence of local businesses and has been shown to improve firms' performance (Bruno & Hauswald, 2013). Although it is generally accepted that the presence of international banks is positive for the overall economy, there is much debate around the actual impact and benefit of these foreign entities.

The last decade has seen an unprecedented rise in globalisation with cross-border bank activity increasing as more banks have ventured abroad (Claessens & Horen, 2014). Cross-border banking is a worldwide phenomenon with banks expanding into new markets in other countries to find new growth channels. For the period 1995 – 2009 foreign bank presence in emerging markets grew by 74% and these entities have become important providers of financial intermediation in the various countries in which they operate, with over 50% of the banks in Sub-Saharan Africa being foreign owned in 2009 (Claessens & Horen, 2014). The next section discusses the themes related to this topic.

2.2 Background discussion

Foreign banks comprise virtually the whole financial system in some African countries while they play no part or just a marginal role in other regions. Colonisation introduced cross-border banking into Africa, however this trend was reversed in the 1980's with the arrival of financial liberalisation (Beck, 2015). Intracontinental cross-border banks are now more important in Africa than the long-established European and American banks (Enoch, Mathieu, Mecagni, & Kriljenko, 2015). Enoch et al. (2015) also identified seven banking groups that

dominate in terms of their geographic footprint, namely, Attijariwafa Bank from Morocco, Groupe Banque Centrale Populaire from Morocco, and Banque Marocaine du Commerce Extérieur BMCE]/Bank of Africa [BOA] from Morocco; Ecobank and Oragroup from Togo; Standard Bank from South Africa; and United Bank for Africa from Nigeria. The majority of these banks have expanded through acquisition with South Africa's Standard Bank Group being one of the first African banks to pursue a pan-African strategy. There are also foreign banks with a strong presence in Sub-Saharan Africa that include Standard Chartered (United Kingdom), Barclays (United Kingdom) and Société Génerale (France).

Africa is generally more open to foreign banks than any other region and the continent has one of the most undeveloped financial systems worldwide. Countries across the region, especially those with underdeveloped equity markets will depend on banks for debts and foreign banks often represent an invaluable source of capital for firms. The shallow and relatively small size of the financial systems gives the continent more potential in reaping the benefits of economies of scale and creating financial and economic development than anywhere else in the world (Enoch et al., 2015).

2.2.1 Environmental factors and considerations

Typically, host countries focus on relationship lending, however, the foreign banks specialise in financing foreign enterprises of their nationality which is known as the follow-your-customer strategy (Haselmann, 2006). Some additional factors that impact a foreign bank's location decision is forecast economic growth, local bank inefficiencies, costs and regulations. Bilateral factors like cultural similarities, geographical likeness, competing investors, similar levels of development and size of economies also play a role is the decision to enter a country (Claessens & Van Horen, 2007). These are typically referred to as pull factors which relate to the long term strategic goals of the bank.

Push factors are when domestic markets become saturated and banks are forced to look outside for growth and secondly, changes to regulatory factors that

encourage banks to expand into other countries (KPMG, 2015). This was the case for Nigeria in 2005, following the consolidation of the banking sector, banks were left with excess capital and this incentivised an expansion into other countries (KPMG, 2015; Lukonga & Chung, 2010). Weak economic conditions in the home country often result in a bank choosing to enter or increase its activity in a host market. Conversely, a flourishing economic climate abroad is likely to increase loan demand and this will attract foreign banks and future economic growth will also be attractive for foreign banks.

Distance factors are also a big consideration as the theory says that the further away a host country is from headquarters, the more different they are (Claessens & Van Horen, 2007). There is a greater possibility of being accustomed to the client if the parent bank is geographically and culturally closer to the host country. Distance has long been recognised as a barrier to foreign investment for banks. Being close to customers allows the bank to easily obtain and transfer soft information which cannot be ascertained from financial statements or reports produced by the client. Distance makes it difficult for foreign banks to extend credit which could lead to cream-skimming. This argument not only applies to geographical distance, but to other measures of distance which involve bilateral decisions (Claessens & Van Horen, 2007).

Foreign banks could concentrate on new and more specialised products that have higher prices for which they can charge bigger margins or they could compete using cost-effective technologies, which would increase their price-cost margins and this would be a motive for entering a new country (Delis, Kokas, & Ongena, 2016). Foreign banks tend to follow their customers and therefore enter countries with which their home country will have strong trade linkages. The increasing trade linkages between African countries are a significant contributor to the upsurge in intracontinental cross-border banking.

Over the last few decades, many developing countries have liberalised their financial policies, encouraging the entry of foreign banks into the local market. This has the effect of increasing competition by lowering lending rates which

benefits borrowers and also introduces know how and expertise into the local system. Foreign banks with high home country profitability tend to have higher profitability in the host country, especially in developing host economies. Other factors identified by Chen and Liao (2011) which could influence a bank's decision to enter or stay in a new country and which could increase their margin are if the host country has less competitive banking conditions than their home country, higher interest and inflation rates, abolition of regulatory barriers, lower growth rates of GDP and stronger regulatory compliance. Strong legal protection which would promote the use of collateral, different tax rates for capital gains and regulatory reforms would also be considered.

2.2.2 Technology and Innovation

Savings arise when foreign banks leverage their technological advantages or their superior know how to launch new and innovative financial products which they sell at monopolistic prices. Due to the small economies and low levels of financial intermediation, Africa has a lot to gain from cross-border banking through the use of technology and efficiency gains (Beck, 2015). Intracontinental cross-border banks are driving innovation in Africa with the use of technology and are enhancing financial inclusion. A successful example of this in Sub-Saharan Africa was the use of mobile banking in Kenya to reach the unbanked which it seeks to replicate in other EAC markets (Witte, Beck, Fuchs, & Singer, 2014). An illustration of innovations is the fact that African banks have also become lead arrangers for syndicated loans taking over from the traditional European Banks that dominant in these products (Enoch et al., 2015).

The Sub-Saharan region is at the forefront of new technology advancements as well as other innovative products to reach the unbanked population. The region presents massive financial sector growth due to the fact that the markets are largely unsaturated. SSA leads the world in terms of mobile money accounts as 18% of adults have an account whereas only 2% of adults worldwide have one

and this bodes well in relation to financial deepening and inclusion (Global Findex, 2016).

2.2.3 Government and Supervisory Policies

Regulation and supervision are big factors in developing countries as they enable efficient intermediation and can eliminate some of the obstacles to domestic lending. The increasing economic and development integration within Africa is contributing to improved competition, economies of scale and greater financial inclusion, however, these factors raise the importance of transparency and disclosure which is lacking in Africa compared to the rest of the world, as well as the need for supervisory and regulatory oversight (Enoch et al., 2015).

Cross-border banking poses challenges for local supervisors as they have difficulty understanding the new products and services as well as the complex banking structures that are also often introduced by foreign banks. This is due to lack of know-how, resources, skills and expertise, increasing stability risks, especially in times of crises (Mugimba, 2015). Although the recent financial crises had a limited impact on the African banking community, it exposed the difficulties in resolving cross-border issues and the need to implement a workable cross-border operational framework (Enoch et al., 2015).

Although African banks are generally stable and prudent in their approach to capital requirements, the presence of international banks increases the need for transparency and disclosure, good governance, strong prudential oversight, and a legal and regulatory framework that supports effective and comprehensive supervision and crisis management (Enoch et al., 2015). Growth benefits of financial deepening can only be reaped in a stable economic environment in which appropriate governance and regulatory safeguards are in place (Mugimba, 2015).

Stronger legal protection offers creditor security and reduces the risk of default. This encourages entrants to bid more competitively for borrowers, resulting in

reduced costs to consumers. Conversely, weaker legal protection can intensify the difficulties foreign banks experience in lending to small firms which explains why foreign banks show a bias of lending towards larger corporates (Sengupta, 2007). Countries with stronger bankruptcy codes should therefore see greater foreign bank lending. This is due to the lower costs of repossession and liquidation of collateral. This leads to the conclusion that an efficient legal framework contributes to building efficient financial markets by encouraging the entry of low-cost competitors (Sengupta, 2007). Countries with bankruptcy codes that reduce the cost of liquidating should be shown to have higher foreign bank lending (Sengupta, 2007). In a study on East Africa, it was found that institutional quality is an important factor which attracts banks and therefore East Africa should improve their policies and regulations (Kodongo, Natto, & Biekpe, 2014).

Financial infrastructure like efficient payment and settlement systems, consumer protection mechanisms, credit rating agencies and credit information systems, as well as dispute resolution channels, are important to make cross-border banking work in Africa (Enoch et al., 2015). This reduces the costs of doing business and gives potential investors a sense of security and comfort in the systems and processes that are available. In developing countries, it has been shown that foreign banks' presence leads to more severe contractions in times of crisis and this makes it important for crises management frameworks and policies to be developed (Bruno & Hauswald, 2013). More information sharing is associated with a higher ratio of private credit to GNP and less default (Bruno & Hauswald, 2013). Information from credit registries improves bank performance. Credit information sharing has a high impact on growth in developing countries and this could be due to publicly available information being so scarce in these economies. Through the establishment of credit and collateral agencies, information asymmetries can be overcome and could reduce the costs of foreign banks (Beck & Cull, 2013).

Enoch et al. (2015) identified oversight and disclosure requirements as areas of particular concern. The absence of a single accounting standard makes consolidated reporting difficult and the lack of regulatory oversight on a

consolidated basis also poses its challenges. Policies need to be created on a best-for-fit basis instead of using best practice that blindly adopts international standards.

Regulators often lack transparency and do not follow a structured approach when awarding licences. This impedes the effectiveness of their supervision and oversight responsibilities. In Africa, regulators tend to limit banks' entrance through branches which offer more flexibility and only allow subsidisation (Enoch et al., 2015). This creates a separate legal entity from the parent and reflects their wish to contain contagion and is usually associated with a healthy banking sector. This is costlier for foreign banks as they often have to comply with more stringent policies and regulatory requirements which are likely to act as a deterrent to foreign banks. Policy makers therefore, have to consider the trade-off between the different organisational structures for foreign banks in their markets.

Co-operation is required between the various supervisory boards and although this has started, progress needs to be accelerated. Memoranda of Understanding should be a requirement in all countries in which foreign banks operate and this is now a requirement in Nigeria (Enoch et al., 2015). This will ensure that full exchange of information is a requirement for operating in a host country.

Further structural reforms are required to improve effectiveness and drive intermediation and transform the banking sector. These include a stronger regulatory framework, enabling credit information sharing and improving the legal system to deal with bankruptcy, creditors rights and property rights (Podpiera & Čihák, 2005).

Policy makers face a delicate balancing act between reaping the benefits of financial integration while mitigating the risks and guarding against contagion.

2.2.4 Risks

Supporters of cross-border banking say that foreign banks have an advantage in terms of access to capital, economies of scale, risk diversification, bringing in

expertise, as well as technological advantages. This increases pressure and fosters competition with positive outcomes of financial deepening. It also has the advantage of moving the financial system from that of a relationship based model to an arm's length based model (Beck, 2015).

Critics, though, would argue that distance constraints may hinder foreign banks from lending to small and informal firms. They could crowd local banks out of the market and the fact that they mostly focus on large corporates may mean that they ignore smaller businesses and poorer households. The focus of foreign banks has mainly been on high margin corporate clients instead of retail clients, which has been to the detriment of financial inclusion (KPMG, 2015).

Most cross-border banks that venture into the continent do so to support their large corporates from their home country and often neglect small and medium sized firms. These banks rarely service the bottom of the pyramid which results in financial exclusion, although there are numerous examples of foreign banks contributing to financial inclusion in Africa which is elaborated on later in this chapter.

Foreign banks tend to cherry pick and usually attract clients with their lower cost of funds by virtue of their efficiency gains. Foreign banks have higher profits than domestic banks in developing countries and Sengupta also suggests that an increased presence of foreign banks leads to lower profitability of domestic banks (Sengupta, 2007). A concern for regulators is that foreign banks have a tendency of "cream-skimming" or "cherry-picking" for better quality market segments thereby leaving the high-risk clients to domestic banks. Cherry picking could lead to the lower end of the market being ignored and to reduced lending activity overall.

The presence of foreign banks helps to mitigate domestic shocks, but opens the door for foreign shocks. This contagion risk is shocks that a parent bank can transmit to their foreign subsidiaries. The interconnectedness of the banking systems means that countries are more exposed to spill-overs from cross-border shocks (Enoch et al., 2015).

Foreign banks reduced funding more than local banks during the global financial crisis and this was even more conspicuous in counties where they were not big players or dominant in the market (Claessens & Horen, 2014).

2.3 Performance Measure and proposition

The expansion of intracontinental banking on the African continent leads to improved competition, greater economies of scale which should create efficiencies; it should support financial inclusion and lead to economic integration within Africa (Enoch et al., 2015). These indicators, together with a measure of fragility, are the key parameters used in this study.

2.3.1 Efficiency

Africa's Banks, on average, are less efficient and operate in less competitive environments than other emerging countries, however, they are more profitable (Beck & Cull, 2013). Foreign banks are generally more efficient than local banks and introduce better management practices and improved technologies leading to positive effects on the entire domestic financial system. A deduction can therefore be made that the increased presence of foreign banks results in lowering the costs of supply of credit (de Paula & Alves, 2007). The efficiency advantage of foreign banks also compels local banks to be more competitive, resulting in lower costs and higher margins. Higher margins will however, be dependent on whether these saving are passed onto clients.

Given that capital requirements are in place in most countries, foreign banks' access to capital can translate into lower cost of capital and improved efficiency, but this will depend on whether the local financial market is deep and if local banks are well capitalised. Findings from empirical studies using cross-country comparisons have found a positive relationship between foreign bank entry and competition and efficiency as measured by profitability, net interest margin, and cost efficiency (Enoch et al., 2015).

An efficient legal framework contributes to building efficient financial markets by encouraging the entry of low-cost competitors (Sengupta, 2007). This leads to an open and free market and allows the process of natural selection to occur when better managed banks with lower costs expand, compared to their inefficient counterparts.

Beck suggests that foreign banks could have higher overheads and low spreads due to them dealing with blue chip firms whose projects are more difficult and costly to evaluate (Beck, 2015).

Proposition 1

P_1: Countries with intracontinental cross-border banks are on average more efficient than countries with intercontinental cross-border banks

2.3.2 Competition

Cross-border banks have a comparative advantage in terms of access to capital, technology, risk diversification and skills and management expertise. Intracontinental cross-border banks have an additional competitive advantage in terms of having similar cultures, economic structures and cultural characteristics (Léon, 2016). Foreign banks' entry into a market should result in greater competition in domestic markets and this should put downward pressure on prices as they force domestic banks to improve their efficiencies by enhancing competition. Intense foreign bank presence can result in increased competition through the entry of new banks, which results in more competitive pricing of bank products. The spill-over effect can be reduced for foreign banks if they have a new monopoly product for which they can charge premium prices (Delis et al., 2016).

Competition forces the existing banks to reduce their prices and passes this surplus onto borrowers. Foreign entrants can also attract borrowers using its lower cost of funds as a cost advantage and these benefits should be passed onto the borrowers (Sengupta, 2007). Gormley (2010) provides evidence that

foreign banks tend to have higher profitability, interest rate margins and tax payments than local banks and Senguta (2007) also finds evidence that that foreign banks have higher interest margins, overhead expenses and profitability than domestic banks in developing countries. The paper also found that larger foreign ownership was associated with smaller profitability and margins for local banks.

In order to reduce their internal risk, banks screen potential clients and often only select high quality entrepreneurs to service. Building relationships closes the information gap and can lead to a comparative advantage over competitors and weakens the ability of other lenders to offer funding at lower rates. The ability of banks to gain high quality clients also increases with its cost advantage. The evidence suggests that foreign firms have difficulty in extending credit to small and opaque firms (Sengupta, 2007). A challenge faced by entrants is that they are unable to differentiate between clients who were rejected by other banks and new borrowers who are shopping around for lower rates. At any point in time, the number of new borrowers in the market will be minor compared to the number of existing borrowers and the success of the foreign bank is highly dependent on its ability to attract customers away from other banks.

Local banks should have good relations with depositors and high deposit to asset ratios. The other side of this coin is that foreign banks have access to cheaper liquid funds from the parent company, as well as the international interbank market and will therefore be able to lend at lower rates (Delis et al., 2016). There are also arguments that say foreign banks could reduce competition when they enter the market through acquisition and become a dominant player as this could have a crowding-out effect. This can be explained as foreign banks exerting competitive pressure on domestic banks, resulting in them cutting back on the operations and lending less which will ultimately reduce the availability of credit in the market or even exiting the market. Also, since cross-border banks are active in many markets, they may not have a willingness to compete and the multi-market contacts may prompt them to partake in collusive behaviour instead of enhancing competition (Léon, 2016).

Gormley (2010) shows evidence that, in less developed countries, lack of competition and inefficiencies results in high borrowing cost and limited access to credit, however, banking theories that consider information asymmetries argue that increased competition might actually reduce some firm's access to borrowing.

The information disadvantage faced by foreign banks forces them to price their products more competitively and make them less cost effective initially. In the case of greenfield investments, a competitive advantage will only be created with the use of superior screening processes. Foreign banks counter the information asymmetry when entering markets by using collateral as a screening device. Acquisitions allow foreign banks access to existing credit records that contain information about the quality of the portfolio. The foreign banks are usually better at generating hard information based on numbers and have less access and reliance on soft information. This is once again related to the effect of distance on their ability to generate soft-information production. Informational advantage can be overcome through acquisitions or by having superior data collections and processing expertise in the forms of better credit scoring technology and prior experience. Whilst there are many benefits to foreign bank entry in emerging markets, information asymmetries may prevent the entrants from realising these benefits.

Greenfield entry is an organic strategy and adds to the number of players in the market. These entrants generally have a better quality loan book than acquirers and charge lower loan rates and usually extend credit much faster than their counterparts that entered through acquisition (Schmidt, 2008). The mode of entry plays a big part in the competition factor as greenfield entry increases the number of banks in the domestic banking industry while acquisition keeps the number of banks the same. The method of entry therefore determines the distribution of information and the level of competition between domestic and foreign banks. It is suggested that the predominant mode of entry of Pan-African banks is through acquisition (Enoch et al., 2015).

To create credit market efficiency, it is vital to reduce entry barriers to competition and better institutions and legal protection needs to strengthen to reduce these barriers.

The Lerner Index which is discussed in this paper is frequently used to measure mark-ups in banking and is used to indicate the level of competition in the banking industry. It is defined as the difference between output prices and marginal costs (World Bank, 2013).

Another indicator which is used to analyse this proposition is the Gross Loans/ Gross Loans of the Industry in order to determine dominance in the market.

Proposition 2

P_2: Intracontinental cross-border banking leads to greater competition within the banking sector

2.3.3 Financial Deepening and Financial Intermediation

Foreign banks have access to alternative sources of funds from their countries of origin and could introduce more specialised and sophisticated banking products which are monopolistically priced (Delis et al., 2016). Also, these banks are usually more cost-efficient through the use of their superior technologies, especially if the banking sector of their country of origin is more developed than the host country. However, in order to win over the market segment, the foreign bank may need to reduce their prices to order to better loan terms in order to overcome the information handicap that it is likely to face (Delis et al., 2016).

The financial systems in Africa are a lot shallower than other developing countries and less inclusive. A large proportion of the African population does not make use of formal financial services with banking penetration still as low as 36% in some larger economies. Commercial banks' reach in terms of branches and ATMs as a proportion of the population remains well below global averages (KPMG, 2015). These channels are not, however, suited for unbanked

populations in Africa which are largely rural based and are widely dispersed and new channels are required. The focus of foreign banks has mainly been on high margin corporate clients instead of retail clients which has been to the detriment of financial inclusion (KPMG, 2015).

Africa's financial system has lots of room for development and financial deepening to create more inclusion and financial integration. Deepening could be in the form of introducing new services, platforms, products and innovations. With the intention of focusing on larger firms, lending to small and medium sized firms is often overlooked - this phenomenon is magnified in emerging markets. However, the entry of foreign banks can lead to crowding out of local banks due to the follow-the-client approach and serving only high quality, highly profitable firms and the reliance on hard information.

Young and potentially highly profitable firms are ignored as local banks in emerging markets give preference to companies with whom they have relations, although they might not be the most efficient. In Africa, it is more likely that local banks fund state owned or family owned businesses with which the bank has a connection and foreign banks can play a big part in boosting entrepreneurship and introducing arm's length transactions and pricing (Giannetti & Ongena, 2009). Their lack of local information is an impediment and local branches of foreign banks may also specialise in funding large firms.

In poorer countries, the level of financial development might not improve as foreign banks mainly benefit high-end customers to the detriment of other borrowers and this hurts the overall prosperity of the population (Bruno & Hauswald, 2013). It has been shown that larger enterprises mostly benefit from cross-border banking due to the foreign banks' reliance on hard information instead of the relationship-based lending technique applied by local banks (Mugimba, 2015), but in Africa, this is being countered by banks exporting successful new innovations which are contributing to inclusion across the continent.

By bringing expertise and skills from their home countries, foreign banks contribute to the development of the entire sector in the host country. From an African perspective, there is evidence suggesting that intracontinental cross-border banking has increased the number of branches, as was the case in Nigeria and the West African monetary zone, as well as the innovative business models from Kenya into the East African Monetary Union (Enoch et al., 2015).

Foreign banks have also contributed to fair lending or arm's length practices through their purchase of state-owned banks and this has given them the ability to mitigate connected lending practices. They also contribute to the improvement in creditors' rights which leads to more sophisticated business conditions and their presence has shown to increase a firm's access to credit (Giannetti & Ongena, 2009).

Foreign banks from well-developed domestic financial sectors employ better lending technologies, but this also puts them at a disadvantage when lending to small firms due to their reliance on hard information (Beck, 2015).

Only banks entering through acquisitions improve the performance of financial dependent firms as this mode of entry helps the bank overcome the asymmetric information challenges faced when entering a new country (Bruno & Hauswald, 2013).

It is important that financial intermediation is improved and African banks need to increase customer loans to be the drivers of this.

Proposition 3

P_3 : Greater financial intermediation is created with the presence of intracontinental cross-border banking rather than intercontinental cross-border banking

2.3.4 Financial Stability and Bank Fragility

Cross-border banking has a diversification of risk effect, not just for the company itself but for the financial stability of the host country and its customers. In times of domestic distress in the host country, the foreign bank will be relatively insulated from any negative effects in the local economy. This, combined with the access it has to funding from its parent, makes it a safe haven in hard times (Mugimba, 2015). During the Mexican crisis, foreign banks operating in Argentina were in a more solid situation as they had better conditions to access funds abroad. Foreign banks also introduced greater financial stability as they could draw in additional funding and capital when required (de Paula & Alves, 2007). There is also evidence showing that during financial busts, only foreign banks extend credit and this contributes to the stability of the domestic economy (Schmidt, 2008).

These banks usually have more diversified loan portfolios which explains why in difficult times, usually the foreign banks remain solvent (Schmidt, 2008). This diversified loan book is commonly measured as fragility and a common indicator used is non-performing loans of the bank (Iftikhar, 2015).

An additional measure that is tested is capital adequacy which is an indicator of potential insolvency and is used to discuss fragility.

Proposition 4

P_4 : The presence of intracontinental cross-border banking results in lower banking fragility than intercontinental cross-border banking

2.4 Conclusion:

African banks now dominate the financial sector in the region and are driving the expansion of financial services and economic integration in Africa. In recent times, global banks have withdrawn from smaller, high risk economies and African banks have been lauded for stepping in and filling the void. This is

especially important at a time when the continent is seeking and is in desperate need of growing intracontinental trade. Although intra-regional trade in Africa is still estimated at only 10 to 12 percent of the continent's total trade, there are concerted efforts by some regional economic communities, like the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC), to foster closer economic ties and to promote trade (Witte et al., 2014).

The literature review shows that the benefits of cross-border banking are not always clear and that it also introduces risk and drawbacks into the financial systems in which it operates.

Intracontinental cross-border banking is being touted as a superior and better option for Africa than intercontinental cross-border banking. It could create genuine intermediation, competition and improve the current state of the banking markets in Africa. Government and supervisory support and policies will be required though to ensure that the gains are shared at all levels and that genuine improvement is created. This will be costly and will require immense co-ordination, participation and people working together. However, before resources are used in creating policies and building additional capacity, we need to know whether intracontinental cross-border banking truly is productive for the continent.

3 CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology that was used in answering the research propositions posed in the previous chapter. This chapter begins with a discussion on the research methodology used, as well as a description of the research design, population and sample that was used. The data collection, analysis and limitations are then considered. The last section entails a discussion on the validity and reliability of the research methodology that was applied.

3.2 Research methodology

The research approach that was used was quantitative. According to Kumar, this method is used to calculate the variation in a phenomenon, situation, problem or if data is gathered using predominantly quantitative variables, and if the analysis is geared to ascertain the size of the variation (Kumar, 2011).

This research methodology is appropriate for this study as the study is based on bank results and macroeconomic data and the objective is to ascertain or confirm the existence of relationships or the lack thereof, and to formulate generalisations where this is applicable. The data requires mathematical/ statistical methods for analysis of the concepts identified in the propositions.

3.3 Research Design

The approach that was used in this study is mathematical modelling and this was the method of data analysis applied. Quantitative research involves data collection that is typically numeric and for which the researcher is inclined to use mathematical models as the methodology of data analysis (Williams, 2011). This is also the approach used in the majority of the literature on banking.

The key advantage of using this approach is that data is used to impartially measure reality and it creates meaning through the objectivity uncovered in the collected data (Williams, 2011).

There are numerous disadvantage of this methodology but the main two are that the researcher's choice of data may be biased and this method could lead to confirmation bias because of the focus on theory testing rather than theory or hypothesis generation (Johnson & Onwuegbuzie, 2004). There is always a trade-off between bias and accuracy.

Standard statistical exploratory data analysis was applied.

3.4 Population and sample

3.4.1 Population

The research explained the impact of intracontinental cross-border banking in Sub-Saharan Africa. This required multi-country bank-level datasets. Individual bank results were analysed and this aggregated to generate a country level view. The population size of 596 consisted of banks operating in Sub-Saharan Africa.

3.4.2 Sample and sampling method

The purpose of sampling in this type of research is to draw inferences about the group from which the sample is selected (Kumar, 2011).

The sampling method that is used is purposive sampling as this uses judgement to identify sources that can best achieve the objectives of the study (Kumar, 2011) and this also introduces bias.

To identify an appropriate sample, a database was compiled by Claasens and van Horen (2011) to identify ownership of banks. This dataset includes 5377 banks, active for at least one year in 137 countries during the period 1995-2009 (Claasens & van

Horen, 2011). Banks with 50% or more ownership are classified as foreign owned. This database was used to group the countries into three categories which are:

Countries that only have domestic banks and intracontinental cross-border banks
Countries that only have domestic banks and intercontinental cross-border banks
Countries that only have domestic banks, intracontinental cross-border banks and intercontinental cross-border banks

Each category consisted of at least three countries and all banks that operate in that country were included. A minimum of 70% of banks operating in each country were included in the sample and this resulted in a sample size of 308 banks which were used.

3.5 The research instrument

In order to carry out detailed analyses of these subjects in this section of the study, data was sourced from various databases. Therefore, the research instrument was secondary data extraction.

Secondary data is easily available and less costly than obtaining primary data, however, there could be cases where the required data is not available, inaccurate or incomplete (Kotler & Keller, 2009).

The data was collected at both a country level and individual bank level and the mathematical model of mean difference was used to compare the sample means using a cross-sectional analysis. Table 1 depicts the three country groupings described in the previous section as well data ranges for the two main data sources which were used.

Table 1: Country Groupings

Group	Group Label	Countries	Data Range from Orbis	Data Range for Lener
Countries that only have domestic banks and intracontinental cross-border banks	1	Namibia; Malawi; Benin; Togo; Chad; Mali; South Sudan; Gabon; Gambia	2010 - 2016	2008 - 2014
Countries that only have domestic banks and intercontinental cross-border banks	2	South Africa; Sudan; Cape verde	2010 - 2016	2008 - 2014
Countries that only have domestic banks, intracontinental cross-border banks and intercontinental cross-border banks	3	Seychelles; Angola; Kenya; Mauritius; Mozambique; Nigeria; Tanzania; Uganda; Zambia	2010 - 2016	2008 - 2014

3.6 Procedure for data collection

Secondary data was used for the research. The WBS licence was used to access Orbis, which is a comprehensive global database of banks' financial statements and intelligence, for individual bank data for the sample of countries identified for Sub-Saharan Africa. Claasens' ownership data which has ownership data was used to identify countries to include in the sample.

The World Bank's African Development Indicators, Central Banks of individual countries as well as data from the Economic Intelligence Unit was used to retrieve macroeconomic and sector data.

3.7 Data analysis and interpretation

This section describes the method and process that was used to analyse the data used in the study and to interpret the results that were presented.

The section discusses the analysis to be performed for each of the propositions based on a comparative analysis of the three groups of countries that were created.

P_1: Countries with intracontinental cross-border banks are on average more efficient than countries with intercontinental cross-border banks

Cost to income, which is a commonly used measure for bank efficiency (Lukonga & Chung, 2010), was used to confirm whether intracontinental banks are more efficient than intercontinental cross-border banks or if there is no difference in comparisons. The higher (lower) the ratio, the worse (better) the efficiency.

P_2: Intracontinental cross-border banking leads to greater competition within the banking sector

A proxy measure that was used is the Lerner Index which measures the degree of competition in banking markets. It measures the variance between the price and the marginal costs, which should be equal in perfect competition and will diverge in less perfect competition (Léon, 2016). Therefore any increases in the Lerner index will imply declines in competition, with unity denoting monopoly and a value of zero signifying perfect competition (Kodongo et al., 2014). To make this test more robust, an additional measure which was used is Gross Loans in relation to Gross Loans of the Industry in order to determine market dominance. A higher ratio would indicate greater dominance of the bank in that industry.

P_3: Greater financial intermediation is created with the presence of intracontinental cross-border banking rather than intercontinental cross-border banking

Financial intermediation was gauged using the traditional measure of loans to deposits which give an indication of a bank's lending activity (Claessens & Horen, 2014). A larger ratio indicates more lending activity while on the other end a smaller ratio will show less lending activity.

P_4: The presence of intracontinental cross-border banking results in lower banking fragility than intercontinental cross-border banking

For this analysis, the ratio of impaired loans to total loan was used to indicate the fragility and is a standard proxy for a bank's asset risk (Shehzad, de Haan, & Scholtens, 2010). A higher ratio indicates greater fragility and riskiness. An additional

measure that was tested is the capital adequacy ratio which is an indicator of potential insolvency and is used to discuss fragility.

3.8 Limitations of the study

There is a significant amount of data required for the analysis and data for some of the smaller entities may not be available and the sample would have to be reduced for that particular country. This was managed by ensuring that a minimum of 70% of banks data is available in order for the particular country to be included as part of the sample.

There are multiple indicators and formula for the performance measure that were tested, however, this paper uses the more common and accepted measures.

Data for the 2010 – 2016 periods was used for the analysis and although looking at a wider time range may be more accurate, this data was not readily available.

3.9 Validity and reliability

Validity in quantitative research is concerned with whether the means of measurement are accurate and whether they are measuring what they intended to measure while reliability is more concerned with whether the results can be replicated (Winter, 2000).

3.9.1 External validity

External validity is a very important goal of quantitative research and measures the extent to which the results can be generalised and applied to other populations (Winter, 2000).

For this study, a sample of countries was identified and grouped based on the individual bank's compositions of ownership. These banks may not be representative of every bank and country in the population as there are vast differences between the banks in Sub-Saharan Africa. This represented a fair sample though, as it embodied the large majority of the population.

The analysis was done over a specific period of time using data from the time period. The economic environment at the time would produce certain results and therefore care was taken before generalising the results of the study across all time frames.

Financial information for 308 banks was used for the period 2010 – 2016. Bank level data was used as input into the three groups mentioned above. The average for each group was calculated using the bank level data as well as the data for each of the years.

3.9.2 Internal validity

The performance measures that were chosen as part of this study could be impacted by numerous variables. If these factors were observed individually, internal validity could be an issue. Since these measures were observed jointly and a large sample was used, validity is not a serious concern.

The study depended on the accuracy and reliability of the data provided in the Orbis Database. Bureau van Dijk, the owners of the database, is a reputable company around the world and known for its reliable data.

3.9.3 Reliability

Reliability is the degree of consistency and accuracy of a research tool. A test is reliable if it produces the same results under the same conditions (Kumar, 2011).

The variables used were all extracted from external sources. These were recognised databases which are used and accepted worlwide. As long as the data is captured consistently, the data and research instrument can be deemed reliable.

Any changes made to the data in the process of analysis was adequately documented and included in this report.

The statistical method used to show the difference in means was the ANOVA test and in the case of non-parametric data, the Kruskal-Wallis test was performed.

4 CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

In this chapter, the results from the quantitative analysis of the bank data is presented. A summary of the statistics is presented and this is followed by the results obtained for each of the propositions which were discussed in section 3.6. A summary of the results is presented at the end of this chapter.

4.2 Statistics and data

The objective of this research is to determine whether intercontinental banking is advantageous to the host countries in which the banks operate. Bank level data was obtained from a database owned by Bureau Van Dijk using a system called Orbis. This extract included country of origin based on ownership greater than 50.01% as well as the financial information required.

Data for 308 banks was used for the period 2010 – 2016. Bank level data was used as input into the three groups mentioned in the methodology section and shown again below. The average for each group was calculated using the bank level data as well as the data for each of the years. This helped with the missing values. Only banking entities were included and data was used for individual bank entities instead of group results. The exception to this was that World Bank Data* was also used for the Lerner Index which was available on a country level.

The Orbis data was used to group the countries into three categories and this grouping is applied to the tables and diagrams that follow. The data used for the Lerner Index was also grouped accordingly and the biographical information for both sets of data is shown below.

Table 2: Country Groupings

Group	Group Label	Countries	Data Range from Orbis	Data Range for Lener
Countries that only have domestic banks and intracontinental cross-border banks	1	Namibia; Malawi; Benin; Togo; Chad; Mali; South Sudan; Gabon; Gambia	2010 - 2016	2008 - 2014
Countries that only have domestic banks and intercontinental cross-border banks	2	South Africa; Sudan; Cape verde	2010 - 2016	2008 - 2014
Countries that only have domestic banks, intracontinental cross-border banks and intercontinental cross-border banks	3	Seychelles; Angola; Kenya; Mauritius; Mozambique; Nigeria; Tanzania; Uganda; Zambia	2010 - 2016	2008 - 2014

4.2.1 Data Modifications

All non-banking entities were removed from the data set.

Nedbank was listed with its origin as the United Kingdom in the database but this was changed for the purposes of this study based on the fact that the bank is incorporated in South Africa and supervised on a sub-consolidated basis by the South African Reserve Bank ("South African Registered Banks and Representative Offices - South African Reserve Bank").

In addition to this, the following data points were not considered in the data set as they were seen as unreasonable and unreliable data points:

In the data used for the Lerner Index, the data point for Nigeria in 2009 had a negative value and this was removed as it made no sense and seemed like an error.
The Customer loans / customer deposits field contained a data point for African Phoenix Investments Limited in 2012 was removed as this is not a traditional bank.
The Impaired loans result for United Capital Bank from Sudan in 2011was removed as it was not a sensible number.
The capital ratio number was an extreme outlier for UBL Bank (Tanzania) Limited compared to industry and was an insignificant number compared to the asset size of the industry.

The cost to income ratio for SME Bank LTD in 2014 was a nonsensical number which was skewing the results.

The data was statistically analysed using SAS JMP V13.

Summary Statistics

The summary statistics for the six main measures which were defined in chapter 3 of the methodology section and that were tested as part of this study, are shown below.

Table 3: Summary Statistics

	Cost to income ratio%	Lerner index	Gross loans/ Gross Loans of the Industry	Customer loans / customer deposits	Impaired loans / Gross loans	Total capital Ratio
Mean	68.166	0.297	6.915	69.943	7.971	24.907
Std Dev	37.517	0.066	11.698	33.966	9.294	18.999
Std Err Mean	2.196	0.018	0.667	2.052	0.620	1.269
Upper 95% Mean	72.487	0.335	8.227	73.983	9.192	27.409
Lower 95% Mean	63.845	0.258	5.604	65.903	6.750	22.406
N	292.000	14	308.000	274.000	225.000	224.000
Skewness	2.923	0.462	2.738	1.012	3.366	3.180
Kurtosis	13.697	-0.327	8.862	3.383	15.157	12.470
Median	62.307	0.290	1.809	70.438	5.489	19.423
Max	311.010	0.416	79.106	218.615	69.230	145.333
Min	-36.022	0.185	0.000	0.000	0.001	3.393

Cost to Income – The range for this commonly used measure for bank efficiency is between the maximum and medium and is large although the mean and median are not significantly different. There are 292 data points from the total of 308 banks and the difference can be explained by missing data.

Lerner Index – This measures the degree of competition in banking markets and the data was available on a country level and the small number of data points is the reason for the small range and the mean and median being very similar.

Gross loans/ Gross Loans of the Industry – This measure was used to determine market dominance and the difference between the median and mean is large and this could be due to outliers in the data. The minimum value is due to small gross loan balances for some banks in the particular industry.

Customer loans/ customer deposits – The mean and median are similar although the range is large for this measure which is used to determine the extent of the banking industries' lending activity. The minimum value of "0" is from two banks (Banco Kwanza Investimento SA and United Capital Bank) which had no or a small amounts of customer loans at certain periods.

Impaired loans / Gross loans – The range of this measure which indicates fragility is large with not much difference between the median and the mean. The minimum value is from two banks which are BGFI Holding Corporation SA and Banco Caixa General Angola SA.

Total capital ratio– This measure indicates potential insolvency and has a range which is large with only 225 data points due to missing data. The median and mean differ and this is due to outliers in the data.

The three assumptions of the ANOVA test which were considered in the analysis are that populations are normally distributed, there are homogeneous variances and each value is sampled independently from each other value (Lane, 2017).

4.3 Proposition 1: Countries with intracontinental cross-border banks are on average more efficient than countries with intercontinental cross-border banks

To determine if the mean "Cost to income ratio% for 2010-2016" of the different country types differ significantly, Analysis of Variance (ANOVA) was proposed.

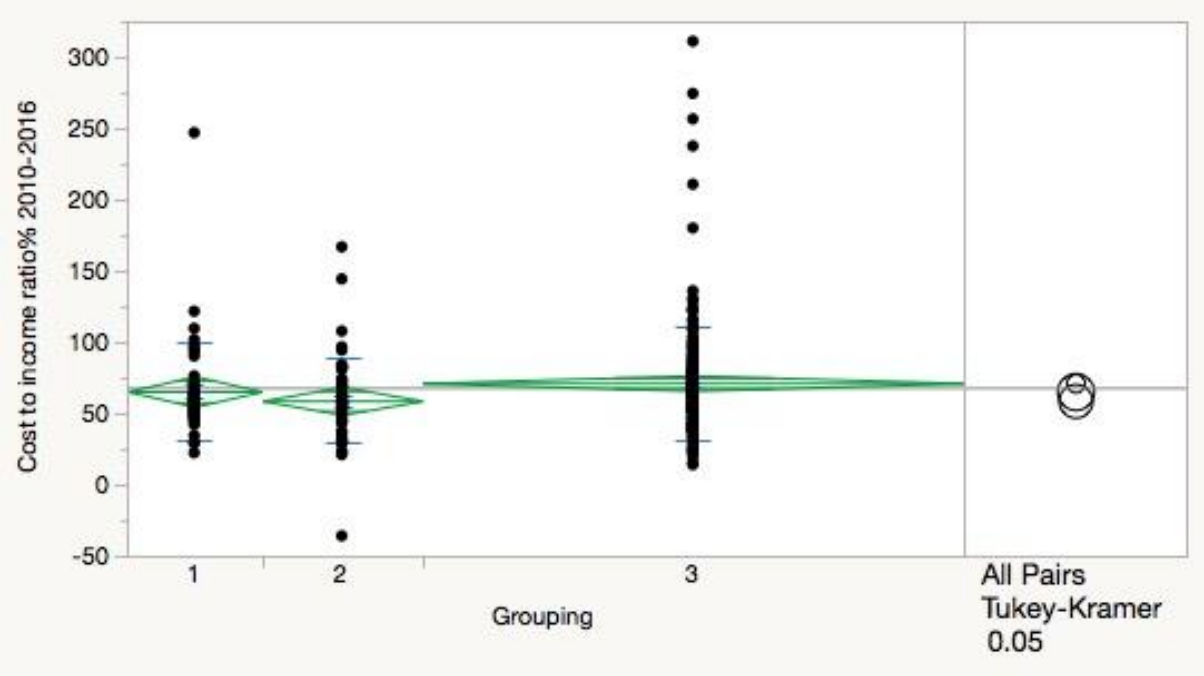


Figure 1: Diamond Graph for Cost to income ratio

Clearly, there are higher levels of “Cost to income ratio 2010-2016” for country type 3 (M = 71.49) than country type 2 (M = 59.09). This shows a difference in the means but the significance of this was tested statistically.

The middle line in the diamond represents the mean “Cost to income ratio 2010-2016”. The vertical endpoints form the 95% confidence interval of the mean. The width of the diamonds indicates the relative sample size.

In this case, it is clear that the diamond for type 3 is higher than type 2, indicating a difference between the types.

One of the assumptions of ANOVA and most parametric statistical techniques, require that the distribution of the variables (scores) that are analysed be normal. The skewness measure is 2.93, which is well above the advised range of -1.5 to 1.5 to be normally distributed. The construct “Cost to income ratio 2010-2016” for lower level management is not normally distributed; therefore, one of the assumptions of ANOVA is violated. A non-parametric technique like the Kruskal-Wallis test must therefore be used. Levine’s test indicated homogeneous variances (p=0.50).

Now the statistical significance of the difference of the ranks was tested using the Kruskal-Wallis test in order to decide if the null hypothesis is rejected at a 95% level of confidence. The null hypothesis states that there is no statistical difference between the rank scores of the categories while the alternative hypothesis states that there is a statistical difference between the rank scores of the categories.

In this study, the Kruskal-Wallis test was used due to a lack of normality.

Table 4: Kruskal-Walis Tests

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	47	6371	6885.5	135.553	-0.969
2	56	7104	8204	126.857	-1.936
3	189	29303	27688.5	155.042	2.341

Table 5: 1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
5.7549	2	0.0563

The p-value from the Kruskal-Wallis test is greater than 0.05 (p=0.0563) and although this result is a marginal case, it had to be treated as no significant difference between rank scores of “Cost to income ratio 2010-2016” of the different types (at a 95% level of confidence). It was not necessary to do a multiple comparison test because there was not significance difference.

In this case, the null hypothesis was not rejected.

Trend Analysis

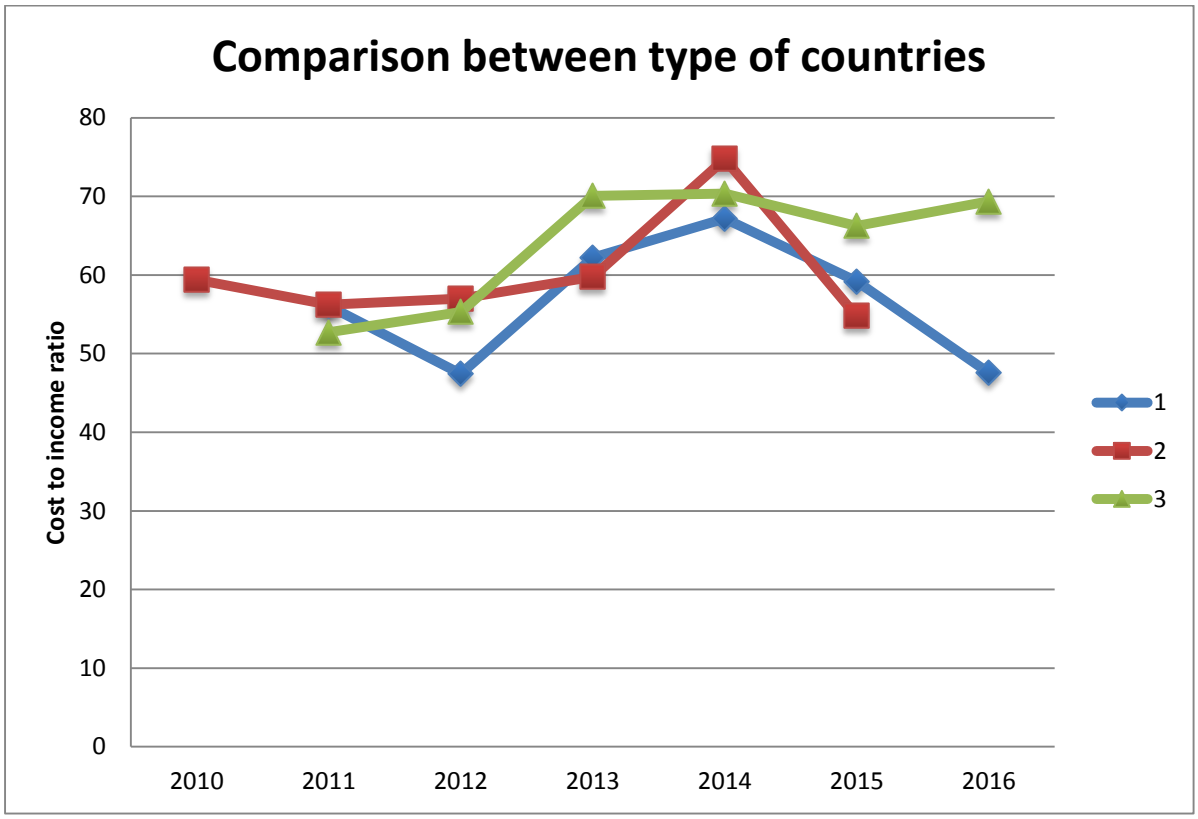


Figure 2: Trend Graph: Cost to income ratio 2010-2016

This is a cross-sectional study in order to consider the effect over time. There seems to be a difference from 2013 forward where one is going up and the other down. The trend analysis does not present any prima facie evidence of efficiency between the groups. Therefore, the analysis is used to discuss indications for the future as well as performance of the three groups**.**

4.4 Proposition 2: Intracontinental cross-border banking leads to greater competition within the banking sector

Two measures were used to measure the level of competition and thus make the test for difference more robust. The study began with the Lerner Index, which is a measure

of competition. Increases in the Lerner index imply declines in competition as described in section 3.6 of this paper. This was followed by Loans/ Loans of Industry which indicated whether the markets are dominated by a few banks or if competition was evenly spread amongst the participants.

4.4.1 Lerner Index

To determine if the “Lerner index 2008-2014” of the different country types differ significantly, Analysis of Variance (ANOVA) was used.

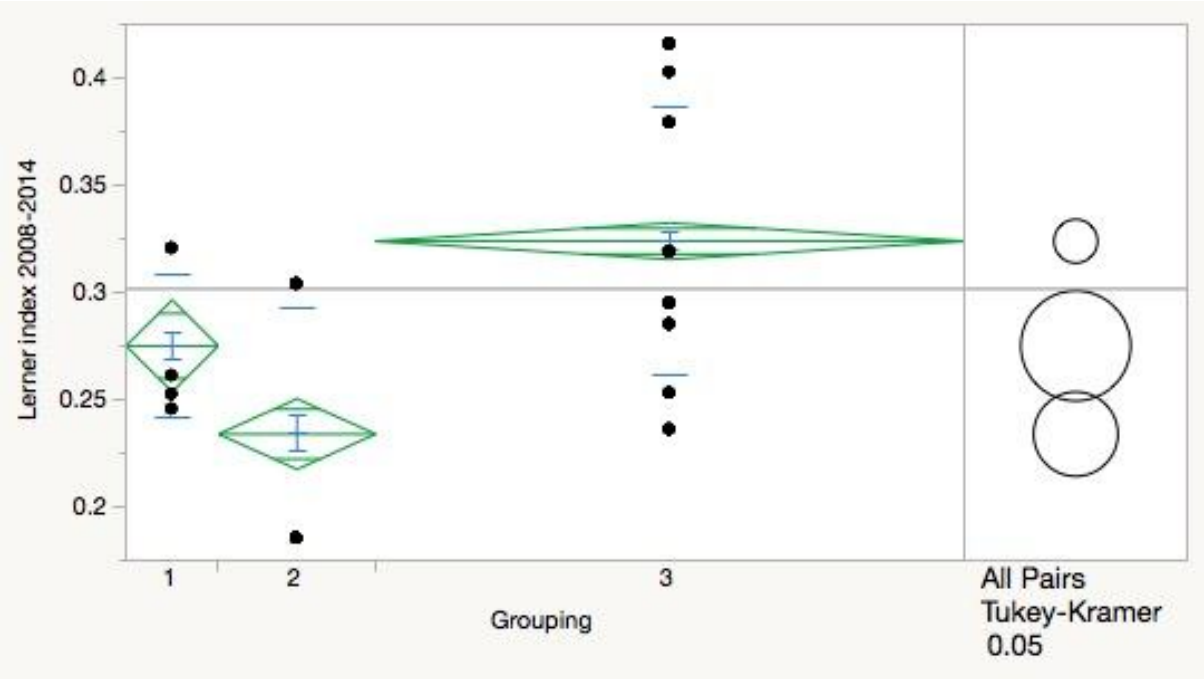


Figure 3: Diamond Graph Lerner Index

Clearly, there are higher levels of “Lerner index 2008-2014” for country type 3 (M = 0.32) and country type 1 (M = 0.27) than for country type 2 (M = 0.24).

The middle line in the diamond represents the mean while the vertical endpoints from the 95% confidence interval of the mean. The width of the diamonds indicates the relative sample size.

In this case, it is clear that the diamond for type 3 and type 1 are higher than type 2 indicating a difference between the types.

Table 6: Statistical Significances - ANOVA analysis

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Grouping	2	0.01390915	0.006955	1.7638	0.2166
Error	11	0.04337305	0.003943		
C. Total	13	0.0572822			

This p-value is greater than 0.05 (p=0.2166), indicating there was no significant difference between the mean “Lerner index 2008-2014” of the different country types at a 95% level of confidence.

The null hypothesis says that there is no statistical difference between the means of the categories while the alternative hypothesis says that there is a statistical difference between the means of the categories.

In this case, the null hypothesis was not rejected.

The skewness measure from the summary statistics for the Lerner Index is 0.462, indicating that the data was normally distributed and the variances were homogeneous when tested with Levine’s test (p=0.17) and therefore the ANOVA was done.

The calculated effect size is 0.51 which indicated a medium size practical effect between the means. The data in this case only consisted of 14 responses which was not enough for the proper testing of statistical significance so this can be tested investigated further with more data.

Trend Analysis

The time-series analysis for the Lerner Index below shows performance for the time range specified below and comparisons can be made between the three groups of countries.

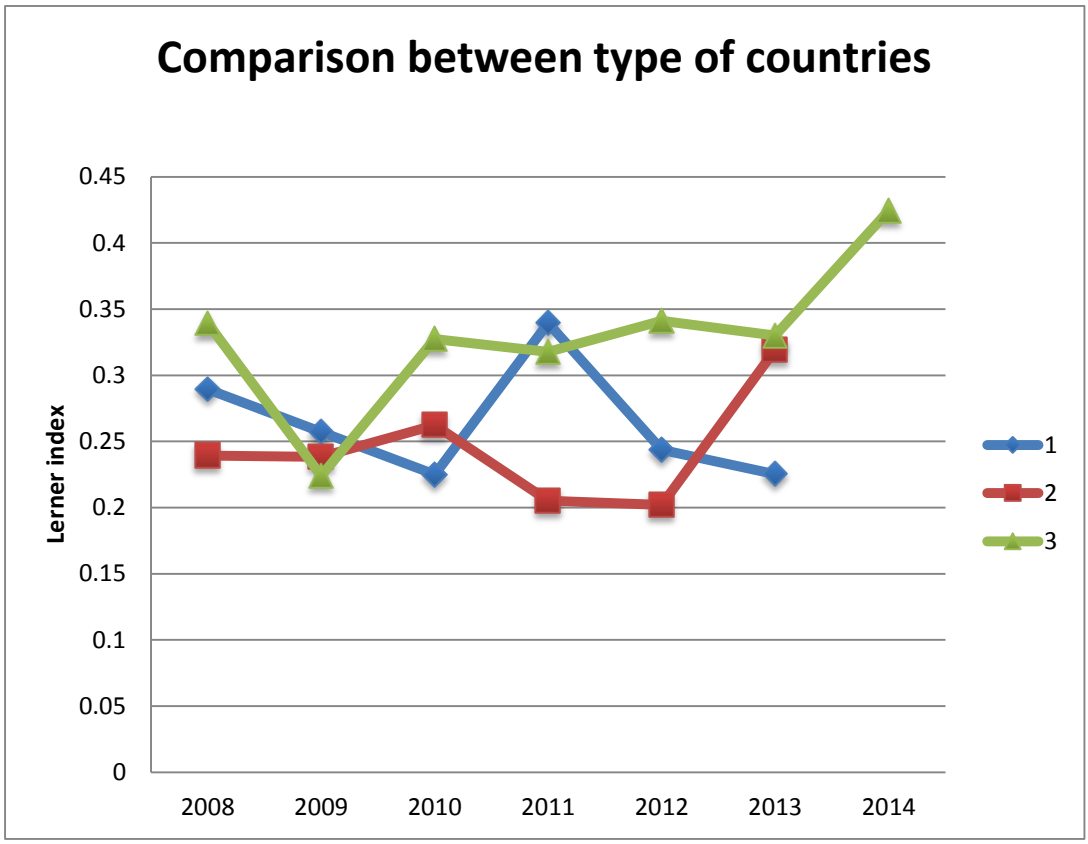


Figure 4: Trend Graph Lerner index 2008-2014

4.4.1 Gross loans/ Gross Loans of the Industry

To determine if the "Gross loans/ Gross Loans of the Industry 2010-2016" of the different country types differ significantly, Analysis of Variance (ANOVA) was proposed.

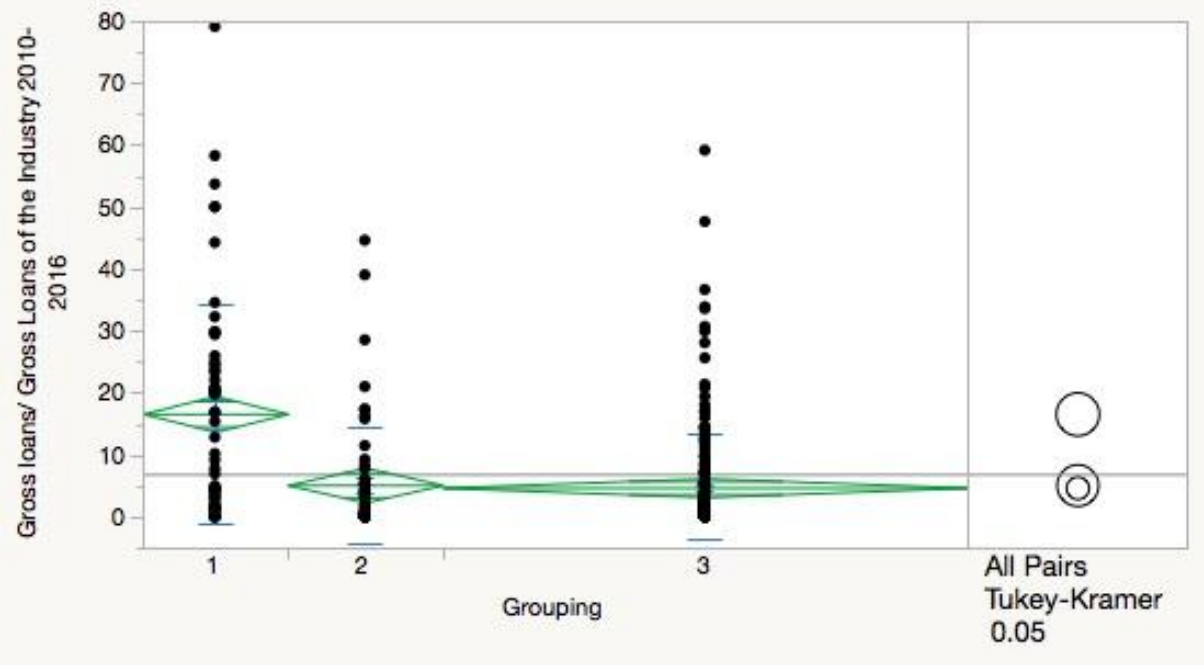


Figure 5: Diamond Graph Gross loans/ Gross Loans of the Industry 2010-2016

There are higher levels of “Gross loans/ Gross Loans of the Industry” for country type 1 (M = 16.67) than for country type 2 (M = 5.17) and country type 3 (M = 4.74).

The middle line in the diamond represents the mean while the vertical endpoints form the 95% confidence interval of the mean. The width of the diamonds indicates the relative sample size.

In this case, it is clear that the diamond for type 1 is higher than type 2 and type 3 indicating a difference between the types.

The Kruskal-Wallis test was rather used due to a lack of normality.

Table 7: Kruskal-Wallis Tests

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	54	11491	8343	212.796	5.297
2	58	7470	8961	128.793	-2.44
3	196	28625	30282	146.046	-2.204

Table 7: 1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
29.7452	2	<.0001*

The p-value from the Kruskal-Wallis test is less than 0.01 (p=0.0001) indicating a significant difference between rank scores of “Gross loans/ Gross Loans of the Industry” of the different types (at a 95% level of confidence).

To assess where the specific differences exist (between the various levels of management) a multiple means comparison tests was performed using the Steel-Dwass tests.

Table 8: Nonparametric Comparisons for All Pairs Using Steel-Dwass Method

Level	- Level	Score Mean Difference	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
3	2	17.2603	10.98101	1.57183	0.2579	0.25225	-0.1683	0.81341
2	1	-25.6577	6.13747	-4.18051	<.0001*	-6.0909	-16.2222	-2.19873
3	1	-57.3861	11.11299	-5.16388	<.0001*	-6.66247	-15.1519	-2.7631

Considering the individual p-vales of the Steel-Dwass comparisons, group 1 differ significantly from group 2 ($p<0.001$) and group 3 ($p<0.001$) while group 2 and group 3 do not differ significantly from each-other.

The Welch test was also used to confirm the results of the nonparametric tests because Levine's test ($p<0.0001$) indicated non-homogeneous variances.

Table 9: Welch Anova testing

F Ratio	DFNum	DFDen	Prob > F
11. 3581	2	92.159	<.0001*

The p-value from the Welch Anova test was less than 0.01 ($p=0.0001$) confirming the result for the KrusKal-Wallis test.

The multiple comparison Games-Howell (which allows for non-homogeneous variances) tests done in SPSS confirmed the results from the Steel-Dwass tests. The results are shown below.

Table 10: Multiple Comparison - Gross loans/ Gross Loans of the Industry

Dependent Variable		(I) Grouping	(J) Grouping	Mean Difference (I-J)	Std. Error	Sig.
Gross loans/ Gross Loans of the Industry 2010-2016	Games-Howell	1	2	11.494252870000000*	2.7104824	0
			3	11.922151200000000*	2.4947193	0
		2	1	-11.494252870000000*	2.7104824	0
			3	0.427898323	1.3639068	0.947
		3	1	-11.922151200000000*	2.4947193	0
			2	-0.427898323	1.3639068	0.947

Trend Analysis

The trend analysis does not present any prima facie evidence; it was used to discuss indications for the future as well as to compare results of the three groups.

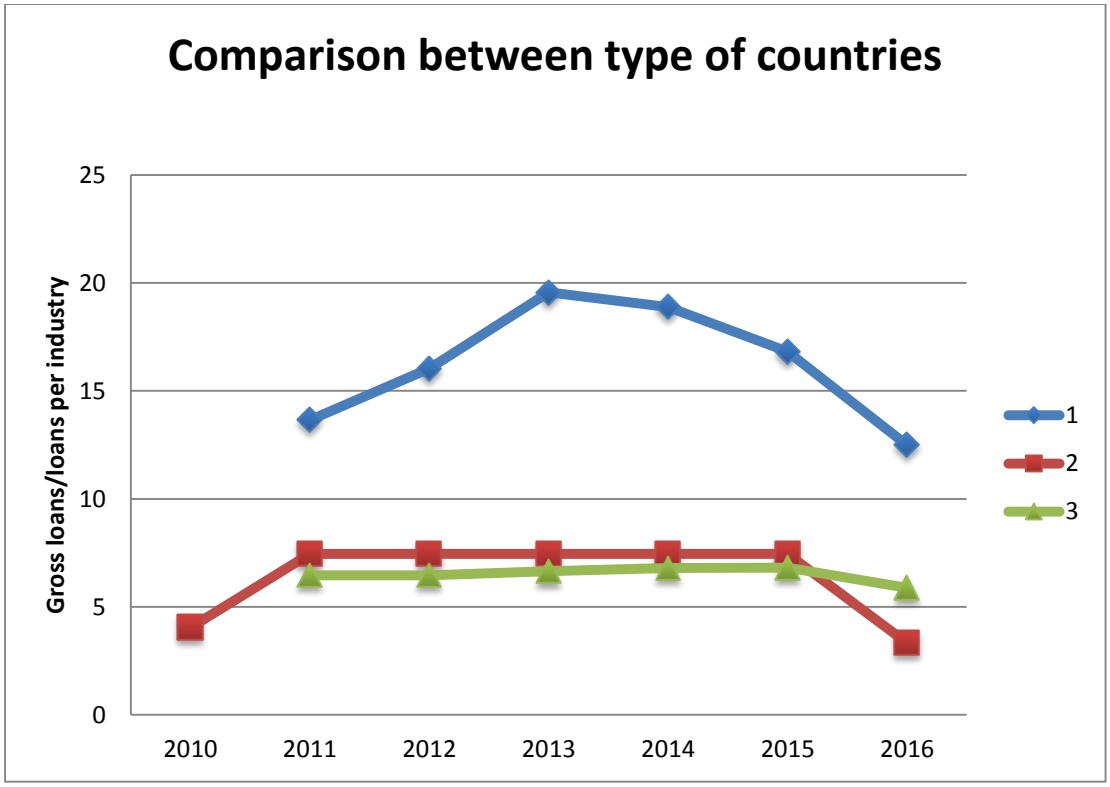


Figure 6: Trend Graph: Gross loans/ Gross Loans of the Industry 2010-2016

4.5 Proposition 3: Greater financial intermediation is created with the presence of intracontinental cross-border banking than intercontinental cross-border banking

To determine if the "Customer loans / Customer deposits of the Industry 2010-2016" of the different country types differ significantly, Analysis of Variance (ANOVA) was proposed.

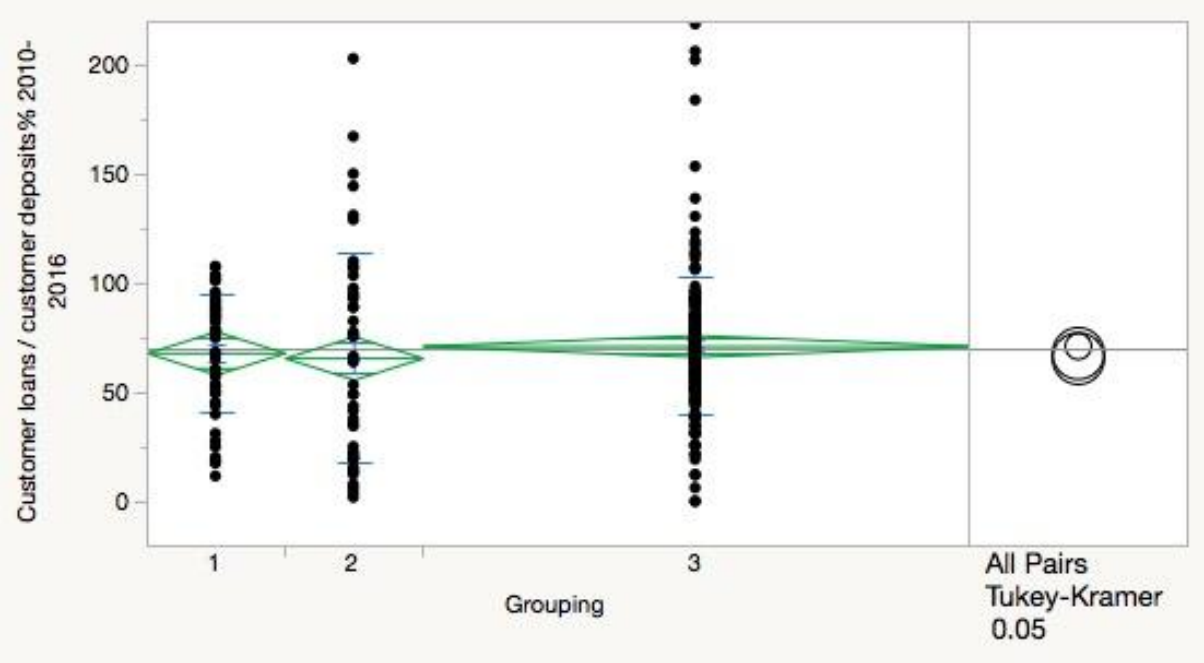


Figure 7: Diamond Graph Customer loans / customer deposits of the Industry 2010-2016

The “Customer loans / customer deposits of the Industry 2010-2016” for all three country groups are around the same range with country type 1 (M = 68.19), country type 2 (M = 65.88) and with country type 3 (M = 71.40) being the highest.

The middle line in the diamond represents the mean while the vertical endpoints form the 95% confidence interval of the mean. The width of the diamonds indicates the relative sample size.

The skewness measure from the summary statistics for the Customer loans / customer deposits is 1.012, which is a borderline case for normal distribution. The Kruskal-Wallis test was therefore used due to a lack of normality. The variances were homogeneous when tested with Levine’s test (p=0.075).

Table 11: Kruskal-Wallis Tests

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	46	6548	6325	142.348	0.454
2	46	5746	6325	124.913	-1.18
3	182	25381	25025	139.456	0.574

Table 12: 1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
1.4437	2	0.4859

The p-value from the Kruskal-Wallis test is greater than 0.01 (p=0.486) indicating no significant difference between rank scores of “Gross loans/ Gross Loans of the Industry” of the different types (at a 95% level of confidence).

The null hypothesis says that there is no statistical difference between the rank scores of the categories while the alternative hypothesis says that there is a statistical difference between the rank scores of the categories.

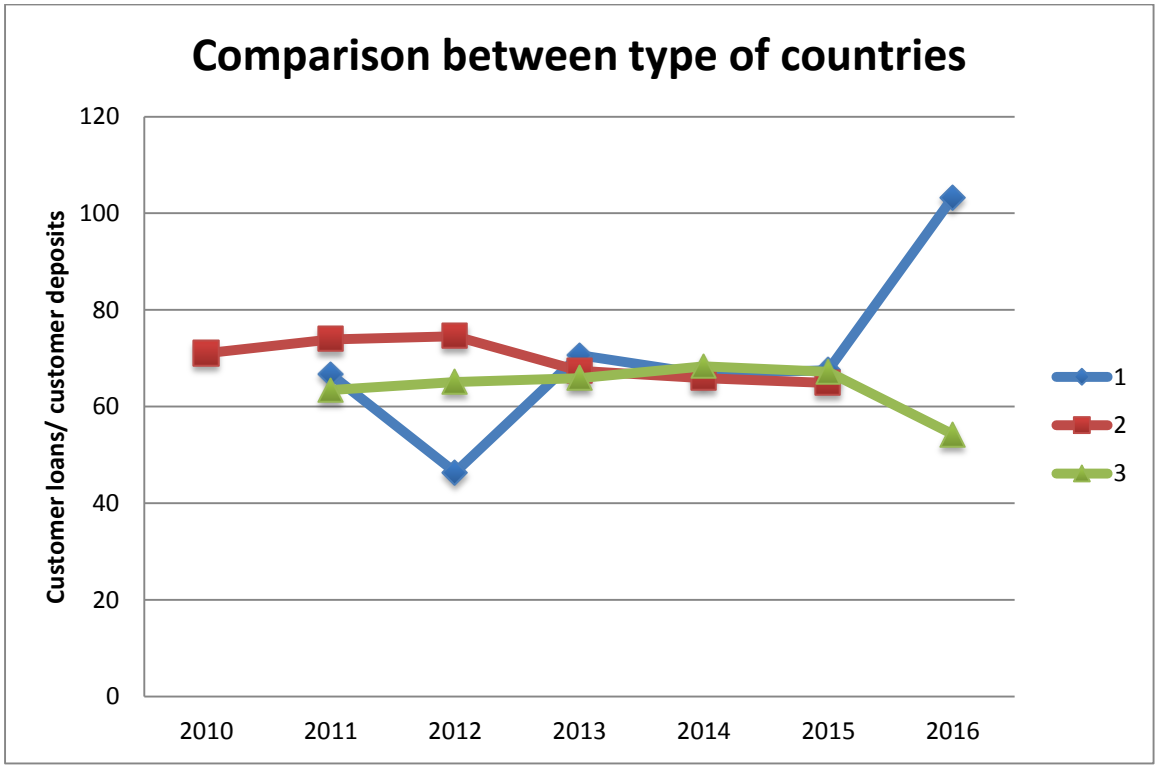
In this case, the null hypothesis was not rejected.

It was not necessary to do a multiple comparison test because there was no significance difference.

Trend Analysis

Although trend analysis does not present any prima facie evidence, it was used to compare performance amongst the three groups, as well as to give an indication of difference in performance of the groups over time.

Figure 8: Trend Graph Customer loans / customer deposits of the Industry 2010-2016



4.6 Proposition 4: The presence of intracontinental cross-border banking results in lower banking fragility than intercontinental cross-border banking

Two measures were tested to make this study more robust. The study began with the Impaired Loans/ Gross Loans which is a measure of asset quality while the Capital Ratio was compared to give an indication of riskiness and fragility of the three groups.

4.6.1 Impaired Loans/ Gross Loans

To determine if the “Impaired Loans/ Gross Loans” of the different country types differ significantly, Analysis of Variance (ANOVA) was proposed.

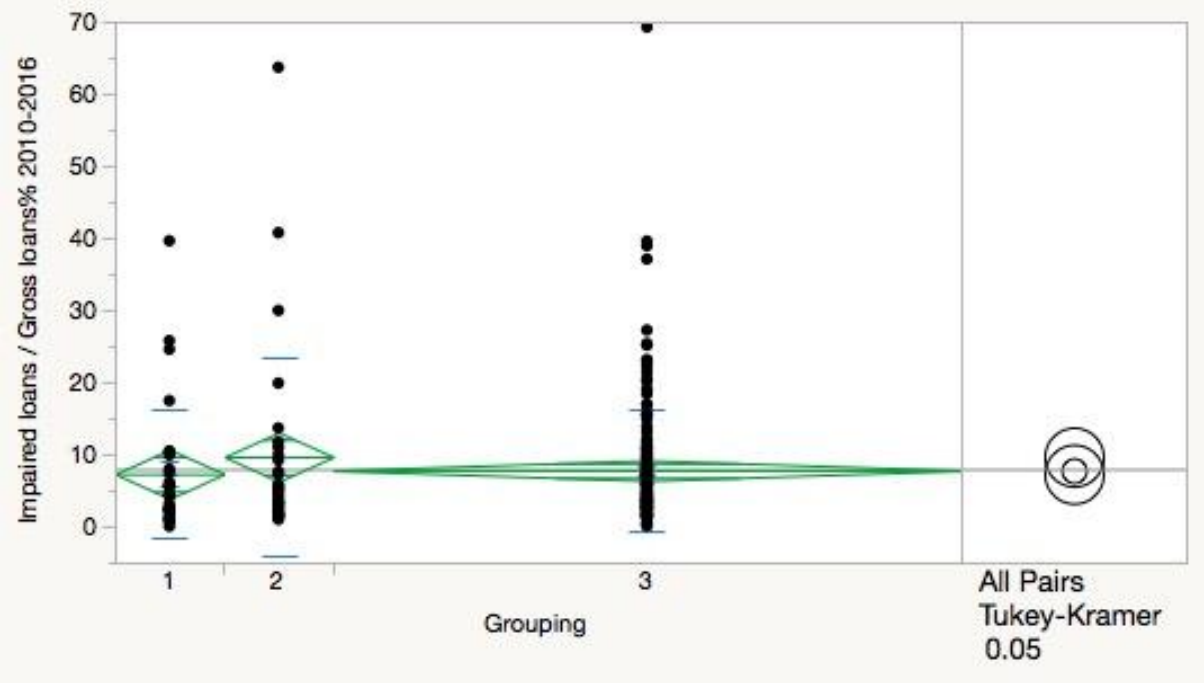


Figure 9: Diamond Graph Impaired Loans/ Gross Loans

There are higher levels of “Impaired Loans/ Gross Loans” for country type 2 (M = 9.67) and this is followed by country type 3 (M = 7.79) with country type 1 (M = 7.30) being the lowest.

The middle line in the diamond represents the mean, while the vertical endpoints form the 95% confidence interval of the mean. The width of the diamonds indicates the relative sample size.

The skewness measure from the summary statistics for the Lerner Index is 3.36, which is outside of the advised range of -1.5 to 1.5 to be normally distributed. The Kruskal-Wallis test was therefore used as a nonparametric test. Levine’s test indicated homogeneous variances (p=0.075).

Table 13: Kruskal-Wallis Tests

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	29	2846	3277	98.138	-1.316
2	29	3215	3277	110.862	-0.188
3	167	19364	18871	115.952	1.153

Table 14: 1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
1.8864	2	0.3894

The p-value from the Kruskal-Wallis test is greater than 0.01 (p=0. 3894) indicating no significant difference between rank scores of “Impaired Loans/ Gross Loans” of the different types (at a 95% level of confidence).

The null hypothesis says that there is no statistical difference between the rank scores of the categories while the alternative hypothesis says that there is a statistical difference between the rank scores of the categories.

In this case, the null hypothesis was not rejected.

It was not necessary to do a multiple comparison test because there was no significance difference.

Trend Analysis

The time-series analysis below illustrates the Impaired Loans/ Gross Loans ratio for the time range specified. Group 2 seems to be moving in the opposite direction in 2015 compared to group 1 and 3 and also had a big jump in 2011.

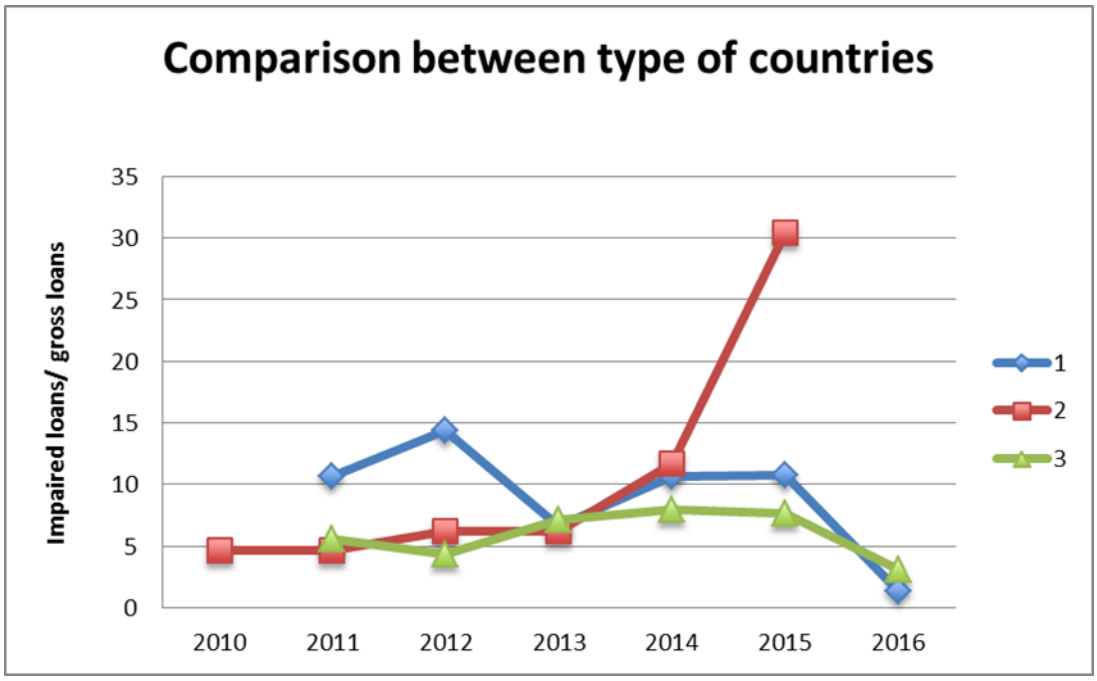


Figure 10: Trend Graph Impaired Loans/ Gross Loans 2010-2016

4.6.1 Total Capital Ratio

To determine if the "Total Capital Ratio 2010-2016" of the different country types differ significantly, Analysis of Variance (ANOVA) was proposed.

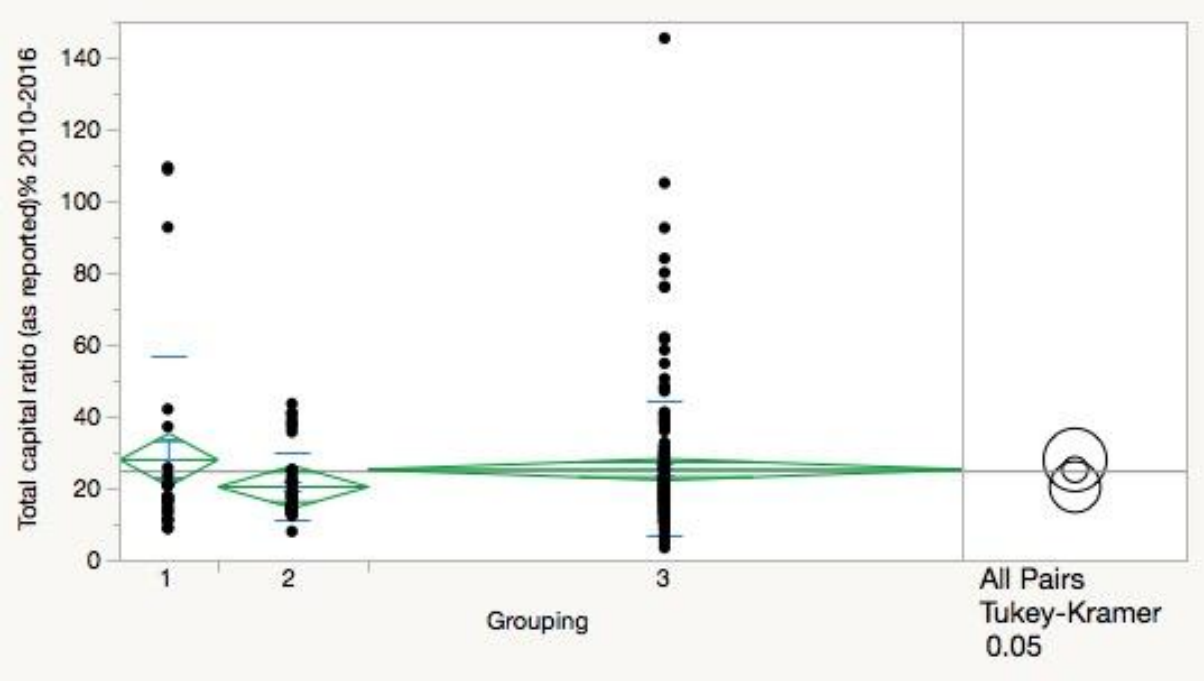


Figure 15 – Diamond Graph Total Capital Ratio 2010-2016

There are higher levels of “Total Capital Ratio” for country type 1 (M = 28.16) and country type 3 (M = 25.45) compared to country type 2 (M = 20.62).

The middle line in the diamond represents the mean while the vertical endpoints form the 95% confidence interval of the mean. The width of the diamonds indicates the relative sample size.

The skewness measure from the summary statistics for the Lerner Index is 3.18, which is outside of the advised range of -1.5 to 1.5 to be normally distributed and therefore the Kruskal-Wallis test was used.

Table 15: Kruskal-Wallis Tests

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	26	2619	2925	100.731	-0.983
2	40	3886.5	4500	97.163	-1.65
3	158	18694.5	17775	118.32	2.078

Table 16: 1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
4.372	2	0.1124

The p-value from the Kruskal-Wallis test is greater than 0.01 (p=0.1124) indicating no significant difference between rank scores of “Total Capital Ratio” of the different types (at a 95% level of confidence).

The null hypothesis says that there is no statistical difference between the rank scores of the categories while the alternative hypothesis says that there is a statistical difference between the rank scores of the categories.

In this case, the null hypothesis was not rejected.

The Welch test was also used to confirm the results of the nonparametric tests because Levine’s test (p<0.007) indicated non-homogeneous variances.

Table 17: Welch Anova testing

F Ratio	DFNum	DFDen	Prob > F
0.3096	2	44.82	0.7353

Trend Analysis

The trend analysis gave an indication of whether this measure differs for any groups over time.

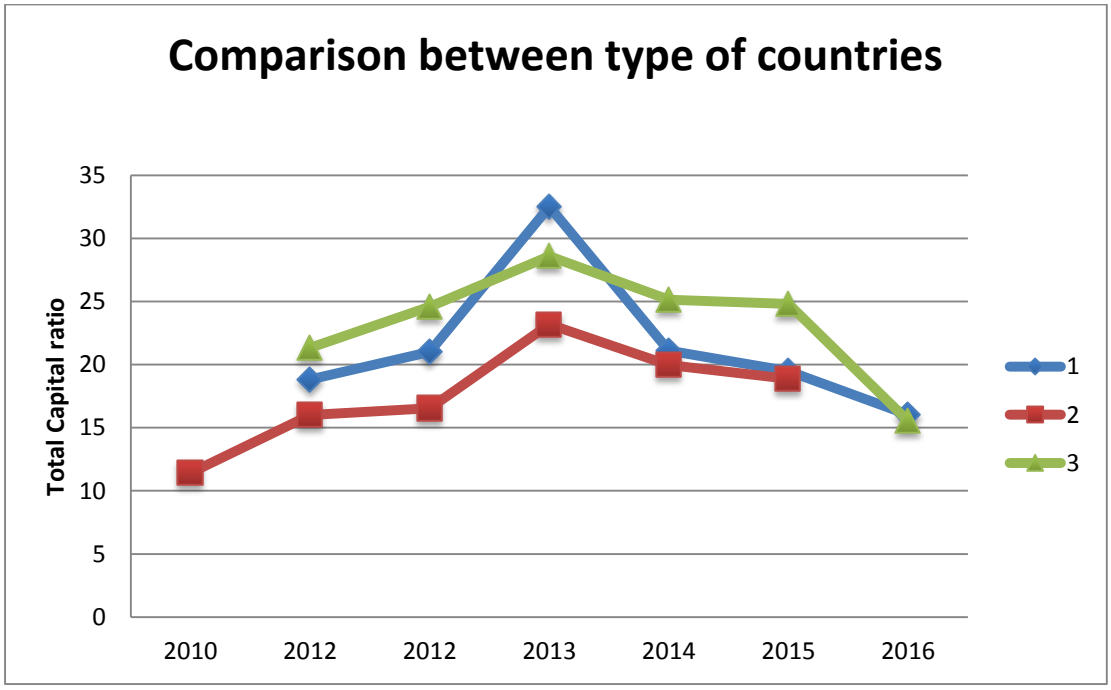


Figure 11: Trend Graph Total Capital Ratio 2010-2016

4.7 Summary of the results

All the propositions were analysed using the following steps:

The means of each the groups were calculated.
The three assumptions of the ANOVA were considered and in all cases, normality was lacking
In cases where an assumption was violated, a nonparametric test which is the Kruskal-Wallis tests was used.
The statistical significance using p-value was considered.
In cases where a statistical difference was established, the Steel-Dwass test, which is a multiple means comparison test, was used
An effect size was then calculated.
To add to the robustness of the test, a cross-sectional analysis was performed for each of the parameters being tested

The table below summarises the analysis for each of the propositions.

Table 18: Summary of Analysis

Proposition	**Measures**	**Means Calculated**	**ANOVA Assumptions Violated**	**Statistical Difference**
Proposition 1: Countries with intracontinental cross border banks are on average more efficient than countries with intercontinental cross border banks	Cost to Income	Yes	Normality	No statistical diff (0.0563)
Proposition 2: Intracontinental cross border banking leads to greater competition within the banking sector	Lerner	Yes	None	No statistical diff (0.2166)
	Gross loans/ Gross Loans of the Industry	Yes	Normality Homogeneity	Statistical diff (0.0001)
Proposition 3: Greater financial intermediation is created with the presence of intracontinental cross-border banking	Customer loans / customer deposits	Yes	Normality	No statistical diff (0.486)
Proposition 4: The presence of intracontinental cross-border banking results in lower banking fragility	Impaired loans / Gross loans	Yes	Normality	No statistical diff (0.3894)
	Total capital ratio	Yes	Normality Homogeneity	No statistical diff (0.1124)

5 CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

The analyses which were performed are evaluated, discussed and interpreted in this chapter. This chapter delves into the key findings based on the results which were presented for each of the hypotheses that were identified. These hypotheses were intended to examine the main facets of the multidimensional environment of the banking industry. Several variables were tested to give an holistic view of the research question.

Key points from the literature review are considered and a conclusion is offered for each hypothesis with the object being to determine whether intracontinental banking is beneficial to Sub-Saharan Africa.

With intracontinental banking being perceived as important for the development of Sub-Saharan Africa and with around 30 percent of intracontinental operations being systemically important, it is imperative that we understand their impact on this region (Enoch et al, 2015).

5.2 Proposition 1: Countries with intracontinental cross-border banks are on average more efficient than countries with intercontinental cross-border banks

A commonly used ratio to measure bank efficiency is cost to income (Lukonga & Chung, 2010) which was used to test this proposition and the findings are discussed in this section.

According to Enoch et al. (2015), empirical studies show positive relationships between foreign banks entry and efficiency as measured by net interest margin, profitability and cost efficiency. The paper goes further by proposing that Pan-African banks give rise to greater economies of scale and efficiency. The

literature review also references the conflicting arguments in which Beck (2015) suggests that foreign banks could have higher overheads and low spreads due to them dealing with multinational firms whose projects are more difficult and costly to evaluate and this would be harmful to their efficiency.

The results for the cost to income for the mean difference shows that there is clearly a difference with countries that have domestic banks as well as intracontinental and intercontinental (country type 3) banks, having a much higher cost to income on average than the country types 1 and 2. When the p-value was examined to determine statistical significance, the result showed that although it was a borderline result, there was no significant difference using a 95% level of confidence between the three groups and that the effect size was very small.

The cross-sectional analysis shows that the groups follow a similar trend although there is a diversion for 2016 in which group 3 seems to be picking up and group 1 going down. This may suggest that group 3 which only has domestic and intracontinental banks could have higher cost to income ratios in the future compared to the other two groups. This could be due to changing economic, regulatory and financial conditions in countries which fall into this group as well as different business models and strategies of these financial institutions.

The finding in terms of no significant difference between the groups is contrary to some of the views echoed in the literature review as this outcome shows that foreign bank operations do not necessarily contribute to greater efficiency than local financial institutions and that average efficiency of group 2, which includes intracontinental banks and local banks is not significantly lower than the other two groups. This supports the view of Beck (2013) that the impact of foreign banks which includes intracontinental banks on efficiency and outreach in Africa has been minimal.

5.3 Proposition 2: Intra-continental cross-border banking leads to greater competition with the banking sector

The literature review emphasises the need for the banking sector to be competitive as this leads to efficiencies through economies of scale as well as general social welfare. Cross-border banks' entry into a market is believed to result in greater competition to the market as it puts downward price pressure on domestic banks and forces them to improve processes and efficiencies (Delis, 2016). Leon (2016) positions intracontinental banks as having an additional competitive advantage in terms of having similar cultures, economic structures and cultural characteristics which should lead to greater competition in the sector

This proposition was analysed using the Lerner Index as well as by testing market dominance using gross loans. The findings for these two tests is discussed below.

5.3.1 Lerner Index

Country type 3 shows higher means than groups 1 and 2. This could imply that there is higher competition, however, after the statistical difference of the means analysis, the result was that there is no significant difference between the means. This is due to the limited amount of data available for this measure. The effect size which quantifies the differences is medium for this test.

The trend analysis shows that the groups are all moving independently from each other. Groups 2 and 3 do show a big increase in 2013 and 2014 respectively which could suggest that intercontinental banks may be contributing to increased competition while group 1 is on a downward trend in both 2012 and 2013.

5.3.2 Gross Loans/ Gross Loans of the Industry

The result from the mean difference clearly shows a country type 1 having a much higher average than the other two groups. The p-value showed that the differences were significant. The findings from the multiple comparison test

indicated that the country groups 1 and 2 as well as country groups 1 and 3 differed significantly while group 2 and group 3 do not differ significantly from each other. The effect size was found to be small to medium.

Countries with just intracontinental banks and domestic banks have a higher mean than the other two groups. This group of countries is dominated by a few banks which results in an asymmetrical market structure and excessive market power being held by a few entities. This could lead to lending volumes and higher interest rates on loans and increased fees which will hurt competition.

As can be seen in figure 6, country groups 2 and 3 track each other very closely, while country group 1 is consistently higher than the other two groups. This suggests that the market has been consistently dominated by a few players although this is trending downwards in recent years. All three groups show a slight dip in 2016 which suggests that the dominance by big players is reducing and that markets may be opening up to smaller players.

5.3.3 Summary for Proposition 2

The differences in the Lerner Index were found to be insignificant and this suggests foreign banking entry which includes both intercontinental and intracontinental banking, does not increase the level of competition in Sub-Saharan countries.

The results from the Gross Loans/ Gross Loans of the Industry test found that there is a greater dominance of a few banks in group 1 on average and this could be related to local policy and regulation which prevents entry into the markets. We can deduce that intracontinental banking results in greater dominance in the banking industry. This results in a few big banks controlling the industry and having a few fringe banks playing a smaller part in the sector. An example of this would be in Togo where three banks have the majority of the total assets of the industry. This increases risk on the financial sector as it may lead to a ‘too big to fail’ mentality as well as a concentration risk.

These findings support the views of Delis et al. (2016) who suggest foreign banks with monopoly products or service could have an adverse effect on competition. This could also be attained with local knowledge and relationships which are used to create a crowding-out effect, forcing other players out of the market.

5.4 Proposition 3: Greater financial intermediation is created with the presence of intracontinental cross-border banking rather than intercontinental cross-border banking

The financial systems in Sub-Saharan Africa are shallow and not very inclusive and intracontinental banks are seen as a solution to this problem. Intracontinental banks are driving innovation which in turn, is leading to greater loans being extended as well as an increase in deposit taking. Empirical evidence suggests that intracontinental Africa banks are serving the under-banked parts of the population and have also led to an increase in branches across the host countries (Enoch et al., 2015).

Customer loans to customer deposits were used as a measure of intermediation and to measure the lending activity in the market (Claessens & Horen, 2014). A larger ratio can be interpreted as greater lending activity. This should translate into greater financial intermediation.

The ANOVA Analysis for the customer loans to customer deposits showed that all the groups of countries were around the same range and that there was not too much of a difference between the three groups. This was confirmed with the p-value test which found that there was no significant difference between the three groups and that the effect size was very small.

The trend analysis in figure 9 shows that the groups follow a similar trend for 2013 to 2015 and also have similar results. In 2016, group 3 moves down while group 1 is moving upwards. This could suggest that group 1 has started offering more loans and that intracontinental banking could be contributing to greater intermediation in the future.

The findings contradict the views of (Witte et al., 2014) that foreign banks and in particular, intracontinental banking, will lead to greater intermediation. This could be due to some of the reasons mentioned in the literature review like intracontinental banks cherry-picking the clients (Sengupta, 2007), intracontinental banks focusing on larger corporates and ignoring smaller businesses and poorer households (KPMG, 2015) as well as information asymmetries which result in foreign banks having less local knowledge as well as minimal credit information about potential clients which impacts their ability to lend (Sengupta, 2007).

5.5 Proposition 4: The presence of intracontinental cross-border banking results in lower banking fragility than intercontinental cross-border banking

Foreign banks are thought to bring in better access to capital, risk diversification, superior credit management as well as technical expertise (Beck, 2015). Intracontinental banks will have the added advantage of familiar cultures, similar politcal climates and economic structures (Léon, 2016). This should translate into intracontinental banking contributing to lower fragility in their host countries. Access to funding from its parent makes it a safe haven during hard times and strengthens the financial stability of the host country (Mugimba, 2015).

Fragility is measured with what extent the banking industry is capitalised using the capital adequacy ratio which indicates the potential for the industry to run into insolvency. Another measure which was used is the impaired loans to total loans which gave an indication of the asset quality of the industry.

The findings for these two tests are discussed below.

5.5.1 Impaired Loans/ Gross Loans

Country type 2 has higher levels of impaired loans/ gross loans on average when compared to country type 1 and country type 2. This could suggest that the banking sector is under more stress than the other two groups, however, the p-value from the Kruskal-Wallis test finds that there is no significant difference between the three groups. For additional insight, the effect size was calculated and was found to have very small practical significance.

The cross-sectional analysis shows that country types 1 and 3 track each other closely from 2013 to 2015 while country type 2 is moving upwards and in the opposite direction in 2015. This suggests the intercontinental banking could be detrimental to the asset quality of the countries in which they operate as they could result in an increase in impaired loans.

5.5.2 Total Capital Ratio

The ANOVA Analysis showed higher levels of the total capital ratio for country type 1 when compared to country types 2 and 3. This could suggest that intracontinental banks are more prudently managed and less likely to be insolvent, however, the p-value found that there was no significant difference between the three groups. The effect size was also found to be small.

The time series analysis in figure 12 shows that the three groups move in similar directions. All three country types follow an upward trend from 2010 to 2013 and this could be due to change due to more countries implementing Basel regulatory frameworks. From 2014 – 2016, the groups all follow a small downward trend which suggests that capital ratios and asset quality have deteriorated slightly.

5.5.3 Summary for proposition 4

There were insignificant differences for the Impaired Loans/ Gross Loans between the three country types and this finding also applies to the test that was performed on the Total Capital Ratio. This supports the view of Lukonga (2010) that many African counties underwent reforms of their regulatory and supervisory frameworks of which a major area of focus was to increase their minimum capital requirements. Greater compliance of the banks' Basel Core Principles would also contribute to the banks in the three country types applying similar capital adequacy policies.

Schmidt (2008) suggests that foreign banks have more diversified loan books which should lead to lower non-performing loans and fragility, however, the results do not present any evidence to support this statement. Distance factors, which were discussed in the literature view, could have been expected to be advantageous for intracontinental banks, resulting in lower impaired loans, but once again, this is not the case.

5.4 Conclusion

The objective of this report was to investigate the impact of intracontinental banking on Sub-Saharan Africa and to identify any benefits that intracontinental banking could offer to the region. Since financial systems are multidimensional, it was necessary to test a variety of facets of a financial system.

Competition and efficiency could lead to greater financial development of the industry, however, this will not necessarily lead to greater intermediation which is an important component of a well-functioning banking system. Fragility had to also be considered as the other components may lead to rapid development but an unstable system could lead to a collapse and crisis situation. The methodology used to test these measures was also very sensible with no technical shortcomings.

Data was found to be a big limitation as it was not readily available. Also, the reliability of the data is questionable as some of the data points seemed unreasonable as mentioned in section 4.2.1. When data was available, there was a lot of missing data which could skew the results.

The results for Proposition 1: Countries with intracontinental cross-border banks are on average more efficient than countries with intercontinental cross-border banks – it was found that there was no significant difference between the three groups. Using the cost to income as a measure and based on the data that was used, it was found that countries with intracontinental banks are not more efficient than countries with intercontinental cross-border banks. This is contrary to the view expressed by Enoch et al. (2015) that Pan-African banks contribute to improved efficiencies.

For Proposition 2: Intracontinental cross-border banking leads to greater competition within the banking sector; there were two tests performed. The differences for Lerner Index were significant, however there was a significant finding when analysing the Gross Loans/ Gross Loans of the Industry. Country type 1 was significantly higher than country type 2 and 3. This suggests that intracontinental cross-border banks lead to dominance of the banking industry and do not lead to greater competition within the banking sector. This is contrary to the view expressed by Leon (2016) who suggests intracontinental banks should foster competition due to the introduction of better technology, skills and expertise as well as cultural similarities.

Proposition 3: Greater financial intermediation is created with the presence of intracontinental cross-border banking rather than intercontinental cross-border banking showed no significant findings as the comparisons of the Customer Loans/ Customer Deposits for all three country types were similar. Although Enoch et al. (2015) state that intracontinental banking in Africa has led to an increased number of branches and more innovative business models for lending, the results from this paper do not support this. It can therefore be concluded that

the presence of intracontinental cross-border banking does not lead to greater financial intermediation.

The findings from Proposition 4: The presence of intracontinental cross-border banking results in lower banking fragility than intercontinental cross-border banking showed that there were no signficant differences between the three country types for both the Impaired Loans/ Gross Loans as well as for the Total Capital Ratios. Witte (2014) suggests that the growing number of intracontinental banking groups improves fragility and strenghtens the financial stability of the financial system, however, based on the analysis, there is no evidence to suggest that this is superior to intercontinental banks. We can therefire deduce that the presence of intracontinental cross-border banking does not result in lower banking fragility.

6 CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

A summary of the findings and the conclusions of this research is outlined in this section. This is followed by recommendations to stakeholders which are then discussed and this chapter concludes with suggestions for further research.

6.2 Conclusions of the study

The purpose of this research was to distinguish between intracontinental and intercontinental cross-border banking in Sub-Saharan Africa and to evaluate the effect of cross-border banking on the region.

As the African economy becomes more interwoven, intracontinental banks are seen to play a major role in advancing these economies and driving integration. Intracontinental cross-border banking has been on the increase over the last few years in Africa and these banks are becoming more systematically important to the countries in which they operate. This expansion of African banks is being lauded as it is seen to be fostering competition, supporting market development and creating financial stability, however, the literature is inconclusive as to whether these benefits materialise. Also, the expansion of African banks lead to a fair amount of costs and risks in terms of policy and supervision to governments and regulatory bodies operating in these countries. It is therefore imperative that we know whether intracontinental banking is advantageous to regions in which they operate.

To satisfy the researcher's curiosity on this topic and due to the multidimensional nature of financial systems, the following research propositions were posed in this paper:

P_1: Countries with intracontinental cross-border banks are on average more efficient than countries with intercontinental cross-border banks

P_2: Intracontinental cross-border banking leads to greater competition with the banking sector

P_3: Greater financial intermediation is created with the presence of intracontinental cross-border banking rather than intercontinental cross-border banking

P_4: The presence of intracontinental cross-border banking results in lower banking fragility than intercontinental cross-border banking

Data from a leading database on African banking was used to categorise the countries into three groups based on the origin of the banks operating in the industry. A mean difference was calculated for these various groups to test whether intracontinental banking is more beneficial to the host country in which they operate when compared to the other two groups.

The results of testing the gross loans of the industry suggests that intracontinental banking could lead to greater dominance of a few banks in the local industry which results in a few banks controlling the industry which is detrimental to competition in the local industry. This is contrary to the view expressed by Leon (2016) which suggests intracontinental banking should foster competition due to cultural similarities as well as the introduction of better technology, skill and expertise.

Although the literature by Beck (2015), Enoch et al. (2015) and Witte (2014) are supporters of cross-border banking and in particular, intercontinental cross-border banking in terms of the competition, efficiencies and financial stability it introduces, this paper finds no conclusive evidence that intracontinental is more beneficial to Sub-Saharan Africa, based on the financial information which was measured and the data that was used.

6.3 Recommendations

Intracontinental banking has been on the increase in recent years and it has become systemically important to many countries on the continent. This form of bank expansion has been lauded by governments and regulators on the continent, however, as can be seen from the results of this paper, intracontinental banking may not be more beneficial than other forms of bank entry and it also introduces risks as is the case with any bank expansion or entry into a new region.

A major issue encountered when embarking on this topic was the lack of basic qualitative and quantitative information on banking in Africa. The many data gaps could be masking the true picture and makes monitoring and reporting of bank performance and risks ineffective. National authorities need to collaborate with supervisory bodies, financial institutions and other countries to identify data requirements and to ensure timely exchange and storage of information. Record keeping needs to be improved and accurate information needs to be readily available. This will aid in improved decision making and will allow for assessing concerns relating to market competition, efficiency and risk management.

Authorities across the region should focus on the improvement and harmonisation of regulatory frameworks and policies. The underlying objective of these policies should be to achieve long term sustainability while also improving efficiencies and this should result in greater competition while also protecting financial stability. There is ample room for improving alignment of social and private incentives and policies should consider both perspectives. A strong and transparent regulatory regime will not only attract banks to the region but will also allow for better supervisory data which could be used to develop scoring methodologies for cross-border banks and to assess their risk profiles. Supervisors in the region need to work together to overcome information

asymmetries, share knowledge, improve governance and disclosure in order to minimise the risks of intracontinental banking while maximising the benefits.

6.4 Suggestions for further research

Much research is available on the benefits of cross-border banking, however, there are very few studies on the impact of intracontinental cross-border banking in Sub-Saharan Africa. The research that is available expresses a more generalist view on the benefits and risks of cross-border banking instead of focusing purely on African banking. Also, there are limited amounts of quantitative studies done on this specific topic for Africa and it is suggested that further studies are done which focuses both on the qualitative as well of the quantitative impact of this in Sub-Saharan Africa.

Although the data methodology applied to this study is sound, it is suggested that future studies include at least 10 years of historical data. More data points should lead to richer and more accurate results. A reliable data source would have to be found and the researcher must ensure that there is no missing data, which was the case in this research.

Isolating the causal effect of each of the variables used in this study could be an interesting future research paper as it is unclear what other correlations could have caused this specific effect on the current variables.

This paper could be used to explore whether the idea about intracontinental banks driving trade integration makes sense and whether this assumption is correct. The findings and discussions from this paper could be used as a background and could be integrated into research on trade in sub-Saharan Africa.

REFERENCES:

Banking Competition. (2013). Worldbank.org*. Retrieved 3 July 2016, from http://www.worldbank.org/en/publication/gfdr/background/banking-competition*

Bryman, A. (2012). *Social research methods.* New York: Oxford university press.

Beck, T., Demirguc-Kunt, A., & Peria, M. S. M. (2007). Reaching out: Access to and use of banking services across countries. *Journal of Financial Economics*, 85(1), 234-266.

Beck, T. (2015). Cross-Border Banking and Financial Deepening: The African Experience†. *Journal of African Economies, 24*(suppl 1), i32-i45.

Beck, T., & Cull, R. (2013). *Banking in Africa. World Bank policy research*. Retrieved from

Bruno, V., & Hauswald, R. (2013). The real effect of foreign banks. *Review of Finance*, rft041.

Claessens, S., & Horen, N. (2014). Foreign banks: Trends and impact. *Journal of Money, Credit and Banking, 46*(s1), 295-326.

Claessens, S., & Van Horen, N. (2007). *Location decisions of foreign banks and competitive advantage.* World Bank Policy Research Working Paper (4113). Washington, DC: World Bank.

de Paula, L. F., & Alves, A. J. (2007). The determinants and effects of foreign bank entry in Argentina and Brazil: a comparative analysis. *Investigación económica*, 63-102.

Delis, M. D., Kokas, S., & Ongena, S. (2016). Foreign ownership and market power in banking: Evidence from a world sample. *Journal of Money, Credit and Banking, 48*(2-3), 449-483.

Enoch, M. C., Mathieu, M. P. H., Mecagni, M. M., & Kriljenko, M. J. I. C. (2015). *Pan-African Banks: Opportunities and Challenges for Cross-Border Oversight* Washington, DC.: International Monetary Fund.

Giannetti, M., & Ongena, S. (2009). Financial integration and firm performance: Evidence from foreign bank entry in emerging markets. *Review of Finance, 13*(2), 181-223.

Haselmann, R. (2006). Strategies of foreign banks in transition economies. *Emerging markets review, 7*(4), 283-299.

Iftikhar, S. F. (2015). Financial Reforms and Financial Fragility: A Panel Data Analysis. *International Journal of Financial Studies, 3*(2), 84-101.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher, 33*(7), 14-26.

Kodongo, O., Natto, D., & Biekpe, N. (2014). Explaining cross-border bank expansion in East Africa. *Journal of International Financial Markets, Institutions and Money, 36*, 71-84.

KPMG. (2015). *Banking in Sub-Saharan Africa*. Johannesburg: KPMG.

Léon, F. (2016). Does the expansion of regional cross-border banks affect competition in Africa? Indirect evidence. *Research in International Business and Finance, 37*, 66-77.

Lukonga, I., & Chung, K. (2010). *The Cross-Border Expansion of African LCFIs: Implications for Regional Financial Stability and Regulatory Reform*. IMF Research Paper. Washington, DC.: International Monetary Fund.

Mugimba, L. B. (2015). *The role of cross-border banking in fostering financial inclusion in sub-Saharan Africa.*

Podpiera, R., & Čihák, M. (2005). Bank behavior in developing countries: evidence from East Africa.

Schmidt, N. (2008). Foreign bank entry: the stability implications of Greenfield entry vs. acquisition.

Sengupta, R. (2007). Foreign entry and bank competition. *Journal of Financial Economics, 84*(2), 502-528.

Shehzad, C. T., de Haan, J., & Scholtens, B. (2010). The impact of bank ownership concentration on impaired loans and capital adequacy. *Journal of Banking & Finance, 34*(2), 399-408.

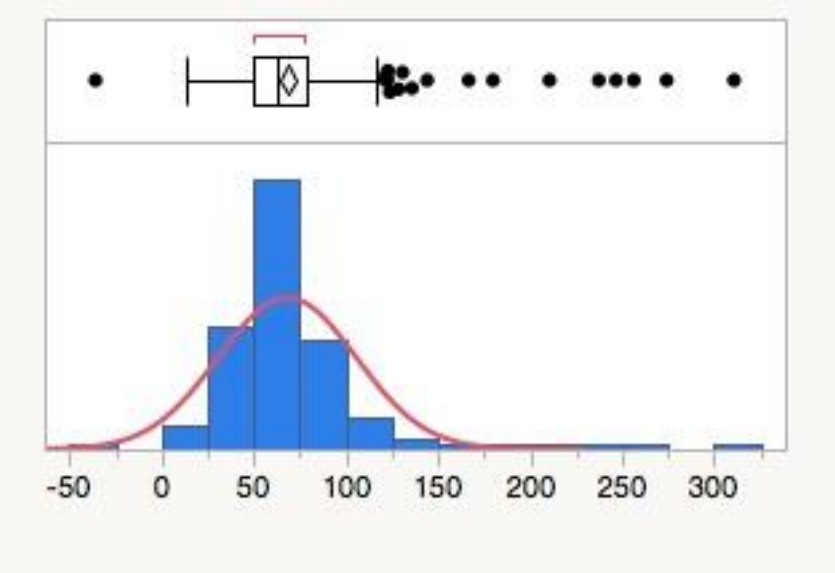
Williams, C. (2011). Research methods. *Journal of Business & Economics Research (JBER), 5*(3).

Winter, G. (2000). A comparative discussion of the notion of'validity'in qualitative and quantitative research. *The qualitative report, 4*(3), 1-14.

Witte, M., Beck, T., Fuchs, M., & Singer, D. (2014). *Making cross-border banking work for Africa*: Eschborn, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Appendix A: Distributions

Cost to income ratio% 2010-2016



Normal(68.166,37.5173)

Quantiles

100.0%	maximum	311.00966667
99.5%		293.96896667
97.5%		175.68868333
90.0%		99.436346667
75.0%	quartile	78.590895833
50.0%	median	62.307333333
25.0%	quartile	50.06625
10.0%		35.612075
2.5%		22.226356667
0.5%		-12.81385
0.0%	minimum	-36.022

Summary Statistics

Mean	68.166002
Std Dev	37.517275
Std Err Mean	2.1955325
Upper 95% Mean	72.487138
Lower 95% Mean	63.844865
N	292
Skewness	2.9231167
Kurtosis	13.697298

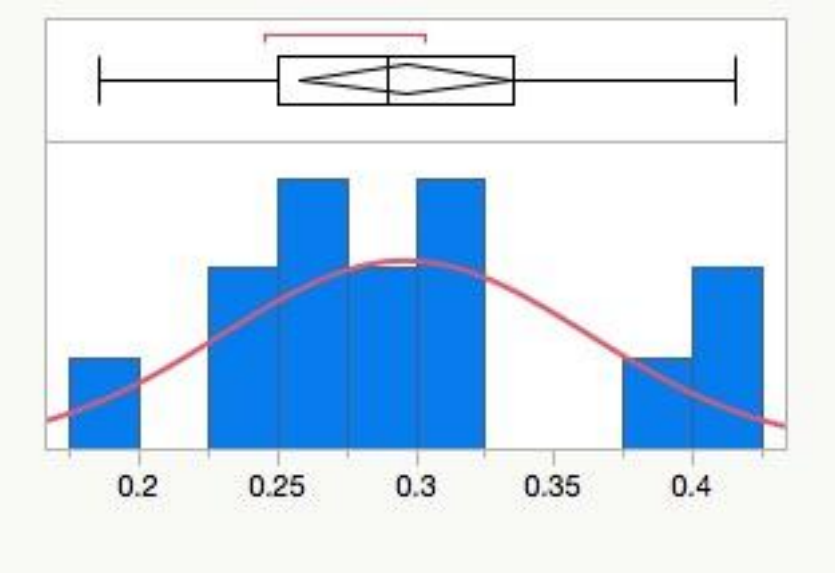
Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	68.166002	63.844865	72.487138
Dispersion	σ	37.517275	34.701127	40.834732

-2log(Likelihood) = 2944.54418312443

Lerner index 2008-2014



Normal(0.29655,0.06638)

Quantiles

100.0%	maximum	0.4156890167
99.5%		0.4156890167
97.5%		0.4156890167
90.0%		0.4090953083
75.0%	quartile	0.3349481036
50.0%	median	0.2898157917
25.0%	quartile	0.2505624458
10.0%		0.210509175
2.5%		0.1851286833
0.5%		0.1851286833
0.0%	minimum	0.1851286833

Summary Statistics

Mean	0.2965466
Std Dev	0.0663801

Std Err Mean	0.0177408
Upper 95% Mean	0.3348734
Lower 95% Mean	0.2582199
N	14
Skewness	0.4615102
Kurtosis	-0.32703

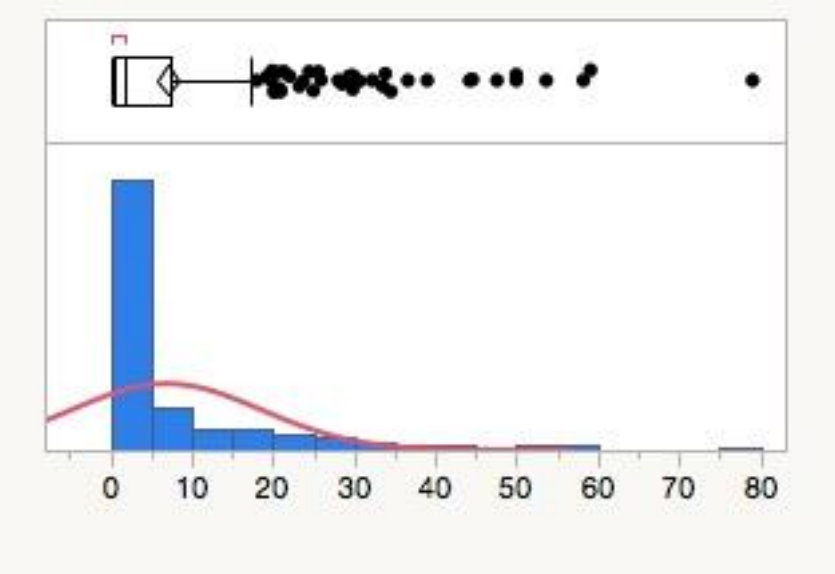
Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	0.2965466	0.2582199	0.3348734
Dispersion	σ	0.0663801	0.0481225	0.1069412

-2log(Likelihood) = -37.2157258843937

Gross loans/ Gross Loans of the Industry 2010-2016



Normal(6.91534,11.6979)

Quantiles

100.0%	maximum	79.106397572
99.5%		68.227216246
97.5%		45.43664256
90.0%		21.016050682
75.0%	quartile	7.2831814181
50.0%	median	1.808954123
25.0%	quartile	0.3665678803
10.0%		0.0257285794
2.5%		0
0.5%		0
0.0%	minimum	0

Summary Statistics

Mean	6.915341
Std Dev	11.697904
Std Err Mean	0.6665499
Upper 95% Mean	8.2269255
Lower 95% Mean	5.6037565
N	308
Skewness	2.7378256
Kurtosis	8.8615975

Fitted Normal

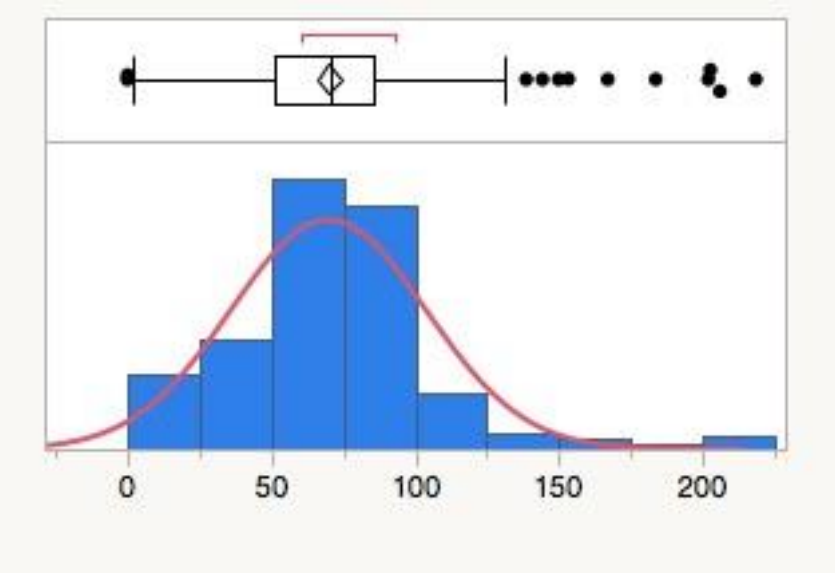
Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	6.915341	5.6037565	8.2269255

Type	Parameter	Estimate	Lower 95%	Upper 95%
Dispersion	σ	11.697904	10.841284	12.702645

-2log(Likelihood) = 2388.06249326923

Customer loans / customer deposits% 2010-2016



Normal(69.9431,33.9658)

Quantiles

100.0%	maximum	218.615
99.5%		213.930125
97.5%		155.10958333
90.0%		104.812
75.0%	quartile	85.264916667
50.0%	median	70.4375
25.0%	quartile	51.451875
10.0%		25.17
2.5%		7.6523125

0.5%		0.05625
0.0%	minimum	0

Summary Statistics

Mean	69.943099
Std Dev	33.965787
Std Err Mean	2.0519482
Upper 95% Mean	73.982752
Lower 95% Mean	65.903446
N	274
Skewness	1.0115682
Kurtosis	3.3834665

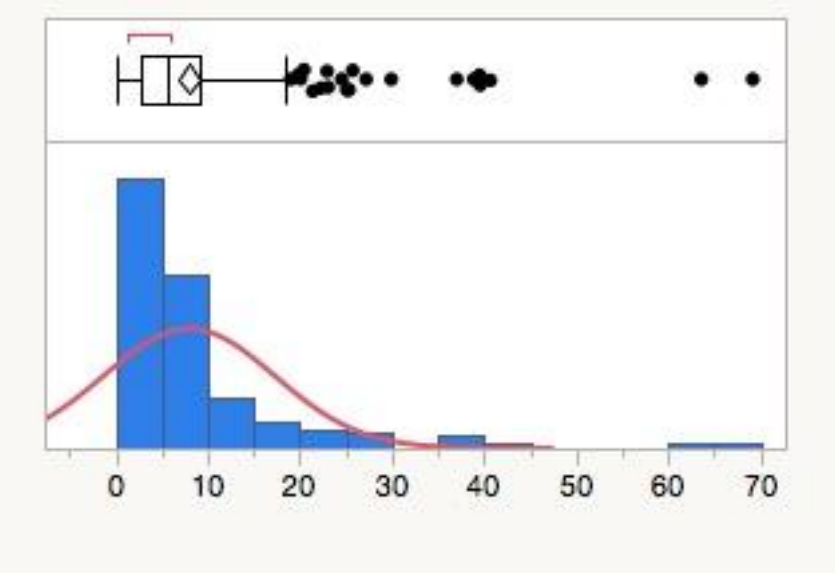
Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	69.943099	65.903446	73.982752
Dispersion	σ	33.965787	31.340034	37.075485

-2log(Likelihood) = 2708.47216606793

Impaired loans / Gross loans 2010-2016



Normal(7.97143,9.29434)

Quantiles

100.0%	maximum	69.23
99.5%		68.5046
97.5%		39.13605
90.0%		17.7997
75.0%	quartile	9.1616666667
50.0%	median	5.489
25.0%	quartile	2.741
10.0%		1.5323866667
2.5%		0.642675
0.5%		0.007565
0.0%	minimum	0.001

Summary Statistics

Mean	7.9714264

Std Dev	9.2943382
Std Err Mean	0.6196225
Upper 95% Mean	9.1924614
Lower 95% Mean	6.7503915
N	225
Skewness	3.365512
Kurtosis	15.15661

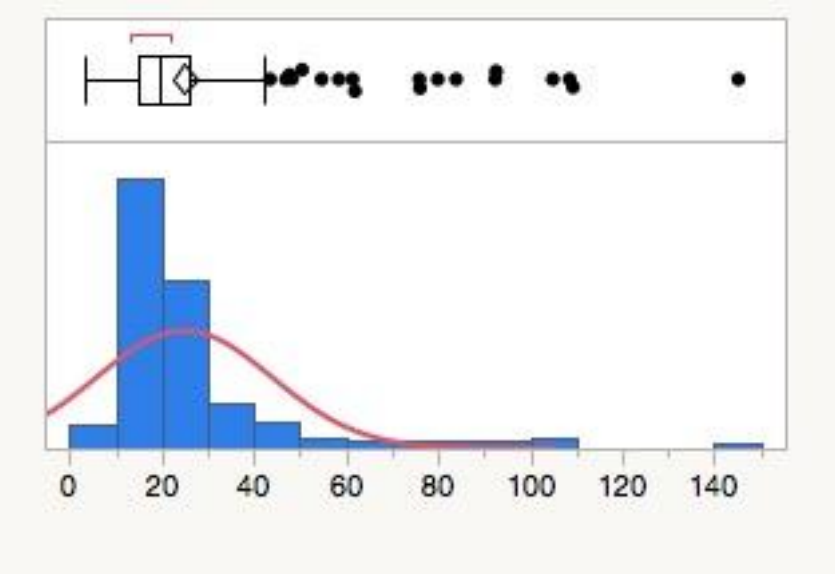
Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	7.9714264	6.7503915	9.1924614
Dispersion	σ	9.2943382	8.5075837	10.242686

-2log(Likelihood) = 1640.75477764258

Total capital ratio (as reported) 2010-2016



Normal(24.9073,18.9985)

Quantiles

100.0%	maximum	145.33333333
99.5%		140.84166667
97.5%		92.5625
90.0%		41.038333333
75.0%	quartile	26.065833333
50.0%	median	19.423333333
25.0%	quartile	14.8875
10.0%		12.236666667
2.5%		8.2734375
0.5%		3.5892708333
0.0%	minimum	3.3925

Summary Statistics

Mean	24.907281
Std Dev	18.99851
Std Err Mean	1.2693914
Upper 95% Mean	27.408819
Lower 95% Mean	22.405744
N	224
Skewness	3.1795568
Kurtosis	12.470089

Fitted Normal

Parameter Estimates

Type	Parameter	Estimate	Lower 95%	Upper 95%
Location	μ	24.907281	22.405744	27.408819

Type	Parameter	Estimate	Lower 95%	Upper 95%
Dispersion	σ	18.99851	17.38702	20.941805

-2log(Likelihood) = 1953.7580027892

Appendix B: ANOVA Analysis

Oneway analysis of cost to income ratio 2010-2016 by grouping

Oneway Anova

Summary of Fit

Rsquare	0.0171
Adj Rsquare	0.010298
Root Mean Square Error	37.3236
Mean of Response	68.166
Observations (or Sum Wgts)	292

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Grouping	2	7004.19	3502.09	2.5140	0.0827
Error	289	402591.69	1393.05		
C. Total	291	409595.87			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
1	47	65.6258	5.4442	54.910	76.341
2	56	59.0874	4.9876	49.271	68.904
3	189	71.4877	2.7149	66.144	76.831

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
1	47	65.6258	33.8589	4.9388	55.684	75.567
2	56	59.0874	30.0683	4.0180	51.035	67.140
3	189	71.4877	39.9555	2.9063	65.754	77.221

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	47	6371.00	6885.50	135.553	-0.969
2	56	7104.00	8204.00	126.857	-1.936
3	189	29303.0	27688.5	155.042	2.341

1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
5.7549	2	0.0563

Nonparametric Comparisons For All Pairs Using Steel-Dwass Method

q*	Alpha
2.34370	0.05

Level	- Level	Score Mean Diff	Std Err Diff	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
3	2	23.3449	10.78247	2.16508	0.0773	8.16052	-0.7513	16.79040

Level	- Level	Score Mean Diff	Std Diff	Err Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
3	1	16.0734	11.12796	1.44442	0.3181	5.12550	-3.5467	13.25200
2	1	-3.5416	5.91045	-0.59921	0.8205	-2.17830	-13.4547	7.11200

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
1	47	33.85885	19.57369	18.18078
2	56	30.06833	20.20475	20.13612
3	189	39.95546	24.15791	23.42005

Test	F Ratio	DFNum	DFDen	Prob > F
O'Brien[.5]	0.4028	2	289	0.6688
Brown-Forsythe	0.6764	2	289	0.5093
Levene	0.6950	2	289	0.4999
Bartlett	3.5351	2	.	0.0292*

Welch's Test

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
3.1496	2	106.62	0.0469*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.35592	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	3	1	2
3	-9.045	-8.471	-0.978
1	-8.471	-18.139	-10.856
2	-0.978	-10.856	-16.618

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level		Mean
3	A	71.487654
1	A	65.625819
2	A	59.087365

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
3	2	12.40029	5.678604	-0.9781	25.77865	0.0757

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
1	2	6.53845	7.383447	-10.8564	23.93330	0.6499
3	1	5.86183	6.083586	-8.4706	20.19431	0.6005

Oneway Analysis of mean (Lerner index 2008-2014) by grouping

Oneway Anova

Summary of Fit

Rsquare	0.242818
Adj Rsquare	0.105149
Root Mean Square Error	0.062793
Mean of Response	0.296547
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Grouping	2	0.01390915	0.006955	1.7638	0.2166
Error	11	0.04337305	0.003943		
C. Total	13	0.05728220			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
1	4	0.269729	0.03140	0.20062	0.33883
2	2	0.244404	0.04440	0.14668	0.34213
3	8	0.322991	0.02220	0.27413	0.37185

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
1	4	0.269729	0.034333	0.01717	0.2151	0.32436
2	2	0.244404	0.083828	0.05928	-0.5088	0.99757
3	8	0.322991	0.068462	0.02421	0.2658	0.38023

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	4	24.000	30.000	6.00000	-0.778
2	2	10.000	15.000	5.00000	-0.822
3	8	71.000	60.000	8.87500	1.356

1-Way Test, ChiSquare Approximation

ChiSquare	DF	Prob>ChiSq
2.0929	2	0.3512

Small sample sizes. Refer to statistical tables for tests, rather than large-sample approximations.

Tests that the Variances are Equal

Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
1	4	0.0343333	0.0253015	0.0209065
2	2	0.0838277	0.0592751	0.0592751
3	8	0.0684623	0.0570035	0.0559078

Test	F Ratio	DFNum	DFDen	Prob > F
O'Brien[.5]	2.6587	1	10	0.1340
Brown-Forsythe	1.6196	2	11	0.2418
Levene	2.0917	2	11	0.1699
Bartlett	0.7452	2	.	0.4746

Warning: Small sample sizes. Use Caution.

Welch's Test

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
1.4867	2	2.642	0.3694

Nonparametric Comparisons For Each Pair Using Wilcoxon Method

q*	Alpha
1.95996	0.05

Level	- Level	Score Mean Difference	Std Err Diff	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
3	1	2.4375	2.2079	1.104	0.2696	0.0459	-0.035	0.1572
3	2	2.1875	2.3936	0.9139	0.3608	0.087	.	.
2	1	-0.375	1.6202	-0.231	0.817	-0.038	.	.

Oneway analysis of Gross loans/ Gross Loans of the Industry 2010-2016 by grouping

Oneway Anova

Summary of Fit

Rsquare	0.148407
Adj Rsquare	0.142823
Root Mean Square Error	10.83037
Mean of Response	6.915341
Observations (or Sum Wgts)	308

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Grouping	2	6234.610	3117.30	26.5762	<.0001*
Error	305	35775.563	117.30		
C. Total	307	42010.173			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
1	54	16.6667	1.4738	13.767	19.567
2	58	5.1724	1.4221	2.374	7.971
3	196	4.7445	0.7736	3.222	6.267

Std Error uses a pooled estimate of error variance

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
1	54	16.6667	17.7812	2.4197	11.813	21.520
2	58	5.1724	9.3014	1.2213	2.727	7.618
3	196	4.7445	8.4995	0.6071	3.547	5.942

Wilcoxon / Kruskal-Wallis Tests (Rank Sums)

Level	Count	Score Sum	Expected Score	Score Mean	(Mean-Mean0)/Std0
1	54	11491.0	8343.00	212.796	5.297
2	58	7470.00	8961.00	128.793	-2.440
3	196	28625.0	30282.0	146.046	-2.204

1-Way Test, ChiSquare Approximation

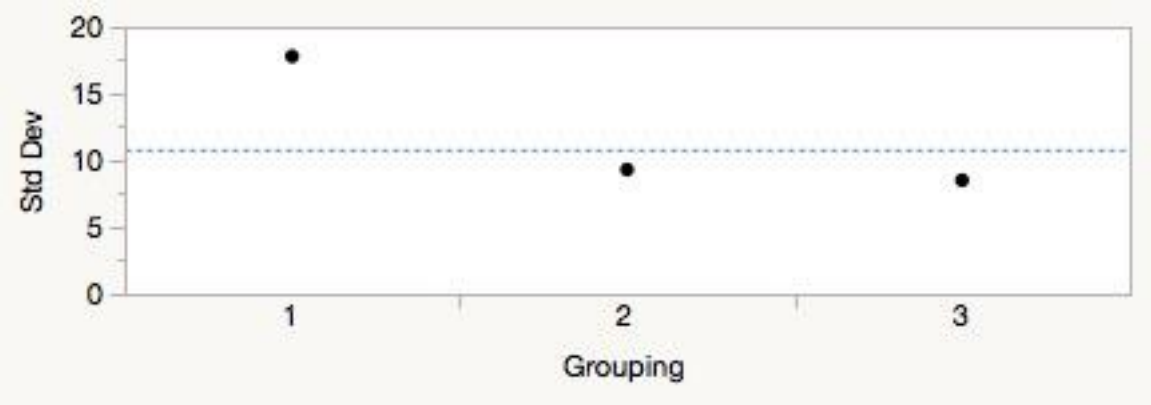
ChiSquare	DF	Prob>ChiSq
29.7452	2	<.0001*

Nonparametric Comparisons for all pairs using Steel-Dwass method

q*	Alpha
2.34370	0.05

Level	- Level	Score Mean Diff	Std Err Dif	Z	p-Value	Hodges-Lehmann	Lower CL	Upper CL
3	2	17.2603	10.98101	1.57183	0.2579	0.25225	-0.1683	0.81341
2	1	-25.6577	6.13747	-4.18051	<.0001*	-6.09090	-16.2222	-2.19873
3	1	-57.3861	11.11299	-5.16388	<.0001*	-6.66247	-15.1519	-2.76310

Tests that the Variances are Equal



Level	Count	Std Dev	MeanAbsDif to Mean	MeanAbsDif to Median
1	54	17.78124	13.86364	13.67235
2	58	9.30143	6.07274	5.03812
3	196	8.49946	5.29852	4.23998

Test	F Ratio	DFNum	DFDen	Prob > F
O'Brien[.5]	9.8753	2	305	<.0001*
Brown-Forsythe	22.9001	2	305	<.0001*
Levene	27.1440	2	305	<.0001*
Bartlett	29.4683	2	.	<.0001*

Welch's Test

Welch Anova testing Means Equal, allowing Std Devs Not Equal

F Ratio	DFNum	DFDen	Prob > F
11.3581	2	92.159	<.0001*

Means Comparisons

Comparisons for all pairs using Tukey-Kramer HSD

Confidence Quantile

q*	Alpha
2.35529	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

	1	2	3
1	-4.9091	6.6705	8.0017
2	6.6705	-4.7368	-3.3851
3	8.0017	-3.3851	-2.5768

Positive values show pairs of means that are significantly different.

Connecting Letters Report

Level			Mean
1	A		16.666667
2		B	5.172414
3		B	4.744515

Levels not connected by same letter are significantly different.

Ordered Differences Report

Level	- Level	Difference	Std Err Dif	Lower CL	Upper CL	p-Value
1	3	11.92215	1.664518	8.00173	15.84257	<.0001*
1	2	11.49425	2.048054	6.67050	16.31801	<.0001*
2	3	0.42790	1.618893	-3.38506	4.24086	0.9622