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Profitability of Insurance Brokerage Firms in Ghana

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Abstract

The financial industry is growing up rapidly, enabling large volumes of transactions to be carried out. This growth has significantly increased the demand for insurance and insurance products. Though prior studies have examined the factors that drive the performance of the insurance industry from life and non-life perspective, not much attention had been given to the contribution of insurance brokers who perform key roles in the insurance sector. This study examined the factors that determine the profitability of insurance brokers in a developing economy, Ghana. Panel data from 64 insurance brokerage firms were sampled over a period of 5 years (2011 to 2015). The study adopted a fixed effects and random effects estimation model using robust standard errors to check for biases. We found that monetary assets and firm size positively affects returns (ROA and ROE) whilst debt and fixed assets had a negative effect on returns. Comparing monetary assets and size, size contributed more to profitability. The study recommends that government, policymakers, and other stakeholders adopt competent growth and development strategies to ensure the sector is more resourced.

Key words

Profitability, Performance, Insurance, Brokerage

JEL Codes: G22, G24, L25

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1. Introduction

The insurance sector plays an important role in the financial sector. Insurance is key in reducing the effects of economic shocks, which improves the economic system (Haiss and Sumegi, 2008). Particularly, they achieve this through contributing towards the reduction of financial cost, spreading of financial loses, risk management and reduction of countrywide risk exposure. Therefore every stable financial system requires the support of a vibrant insurance industry. In developing economies particularly, a vibrant insurance industry can make a significant contribution towards improving the economy.

The Ghanaian insurance industry is one with potential for growth in both life and non-life markets. The total market size in terms of the gross premium was GHS1.568 billion at year end 2015. This represented a growth of 26% from GHS1.24 billion in the year 2014; GHS 862 million for non-life and GHS706 million for life insurance companies. Contribution grew to 55% and 45% (life and non-life) in 2015 compared to 53% and 47% in 2014. In 2013, life and non-life contributions were also 55% and 45%, with corresponding premiums of GHS 582 million and GHS 469 million respectively (NIC 2015 Annual Report).

Table 1. Growth in Gross Premium

Year	Total Gross Premium (GHS)	Growth Rate
2015	1,567,400,946.00	26.42%
2014	1,239,853,442.00	17.85%
2013	1,052,090,982.00	23.68%
2012	850,657,054.00	35.34%
2011	628,528,775.00	37.20%
2010	458,117,751.00	33.60%

Source: NIC Reports

The main contributing factors to the industry's growth were the oil discovery in 2010 and changes to the regulatory framework. However, more of the growth has been linked to increasing demand for life and pensions insurance over the past five years. New developments like micro-insurance products and bank assurance using banks channels continue to propel growth in the industry.

The market size of the brokerage industry stood at GH¢64.7 million as of 2015 representing a growth of 33% from the previous year. And, it has grown at an average rate of 29.26% over the last six years. This consistent growth has been attributed to factors such as IFRS adoption in 2012 and economic factors such as growth in the oil and gas exploration, and mining revenues. The top ten (10) insurance brokers contributed almost 63% of the total brokerage services for the year 2015 with KEK Insurance Brokers being the market leader followed by Edward Mensah Wood and KEK Reinsurance Brokers (Africa) Ltd. The total contribution of the top 10 brokerage firms in Ghana has, however, been declining from 73.7% in 2009 to 62.64% in 2015.

Table 2. Contribution of Top 10 Insurance Broking Companies to Total Commission

Year	Commission Earned (GHC)	Earnings by Top 10 Insurance Brokers (GHC)	Percentage Earnings
2015	64,722,972	40,544,266	63%
2014	48,623,536	30,640,273	63%
2013	35,173,727	23,539,265	67%
2012	27,651,046	19,060,875	68%
2011	20,581,124	14,124,111	68%
2010	16,907,668	11,939,132	71%
2009	13,983,561	10,315,913	74%

Source: NIC Reports

Insurance has traditionally been sold through insurance agents, brokers and directly by the insurance companies. But nowadays, insurance products are being sold through new mediums like banks. This provides another avenue for the insurance companies to get their insurance products to their new clients at the lowest possible cost. Because of the added incentive of flexible payment of client premiums, bancassurance has gradually become a favourite channel for clients to purchase insurance products or pay their premiums. Traditional brokers are therefore left with no option but to reinvent them and/or find other innovative ways to stay relevant to the needs of their clientele.

Some legislation have influenced the insurance industry: The Bank of Ghana (BoG) directive and the subsequently revised directive on foreign currency transactions in 2014 had a profound impact on the insurance market. The continual depreciation of the cedi (the Ghanaian currency) has also made it difficult for foreign companies (or clients) to insure in the local currency. Amendments to the original rule have also made it possible for qualified insurance companies to do business with foreign clients in foreign currency. Further, the introduction of the No Premium, No Cover directive by the regulator (the National Insurance Commission) has had an immense impact on the industry. Before, insurance was bought on credit. So, Insurance companies now had to adjust their systems to remove the 90-day premium warranty. Also, Insurance Brokers had to educate and explain to their clients the rationale behind the directive and clients had to adjust their payment systems to pay insurance premium upfront before cover can be granted. The Ghana Insurers Association also brought into force the New Motor Tariff which increased motor premiums by 400%. This was also a major change which invited concerns of the general public, considering the fact that, motor insurance is a compulsory insurance policy in Ghana. As a result, the industry agreed to apply the increment in three instalments over a period. These changes have influenced the insurance industry to what it is now.

The paper is arranged as follows; the following chapter brings out the main gap this paper seeks to fill. The scope and purpose are then clearly marked up in the next chapter. Supporting theories are then expressed, followed by a review of existing literature. The methodological framework is then elaborated and the regression models stated. Next, the analysis and all associated discussions are presented. Afterward, the findings are summarised and concluded with the appropriate references cited. Other tests that were done are presented in the appendix.

1.1. Problem Statement

The Ghana statistical service puts the economic growth of Ghana at 3.9% as at 2015, a decline from 4.0% in 2014, 7.3% in 2013 and 8.8% in 2012 (NIC 2015, 2014 & 2013 Annual Reports). Inflation increased from 8.8% in 2012, to 13.5% in 2013, 17.0% in 2014 and 17.7% in 2015. Interest rates have been rising whiles the cedi has been depreciating against the major foreign currencies, particularly the US Dollar. With these macroeconomic volatilities and uncertainties in the country, you would expect that demand for insurance products would be high to mitigate the risks in the economy, but insurance penetration, surprisingly, has been low and unstable. Insurance penetration which is defined as the contribution of total insurance premiums to Gross Domestic Product (GDP) stands at 1.17% as of 2015. Though conscious efforts are being made to improve the penetration through the encouragement and development of Micro-Insurance as well as the enforcement of compulsory insurances in the country, these are not significantly increasing the penetration rate.

Table 3. Insurance Penetration Rate

2010	2011	2012	2013	2014	2015
1.89%	1.06%	1.16%	1.42%	1.18%	1.17%

Source: 2010-2015 NIC Annual Reports

The number of licensed insurance brokers outnumbers the number of licensed insurance companies. Licensed brokers grew from 60 to 70 from 2013 to 2014, then to 72 in 2015, whiles number of insurers grew from 43 in 2013 to 45 in 2014, then to 50 in 2015. The numbers of broker participants in the industry also outnumber the insurance companies.

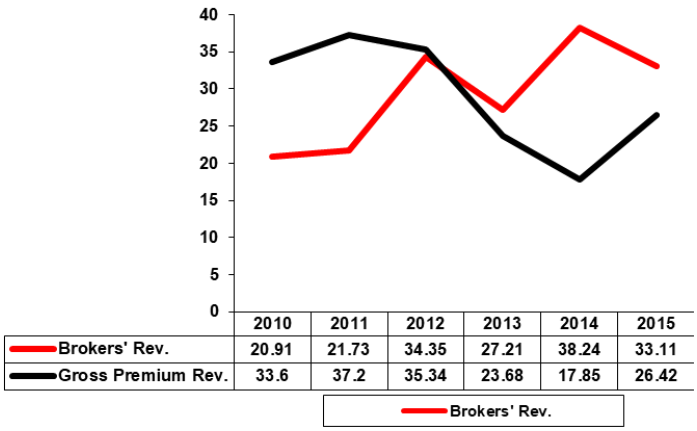
Further, the commission revenue growth of the broker markets has seen considerable growth over the past years, whiles gross premium growth has seen a decline in growth rate. In 2010, commission revenue growth stood at 20.91% whiles gross premium growth was 33.5%. However, in 2015, commission revenue growth stood at 33.11% whiles gross premium growth stood at 26.42% (NIC 2015, 2014 & 2013 Annual Report). The table and diagram below show a representation of the growth rate of insurance companies' gross premiums and insurance brokers' commission revenue from 2010 to 2015. The spike in the premiums and commissions explain why the brokerage market is growing.

Table 4. Growth rates of Premium and Commissions

Year	Total Gross Premium (GHS)	Prem. Growth Rate (GHS)	Commission (GHS)	Comm. Growth Rate (GHS)
2015	1,567,400,946	26.42%	64,722,972	33.11%
2014	1,239,853,442	17.85%	48,623,536	38.24%
2013	1,052,090,982	23.68%	35,173,727	27.21%
2012	850,657,054	35.34%	27,651,046	34.35%
2011	628,528,775	37.20%	20,581,124	21.73%
2010	458,117,751	33.60%	16,907,668	20.91%

Source: 2010-2015 NIC Reports

The lower penetration among most economies has been attributed to a number of factors. According to Beck and Webb (2003), inflation, income per capita, banking sector development, and institutional indicators are the most robust predictors of demand for life insurance products whilst education, life expectancy, the young dependency ratio, and the size of the social security system were seen as weak predictors. In as much as these factors affect insurance penetration, other studies have sought to examine the factors that determine the performance of insurance companies (Malik, 2011; Chen and Wong, 2004; Oscar Akotey *et al.*, 2013). Charumathi (2012) researched the determinants of profitability of Life Insurance companies in India. In Kenya, Mwangi and Murigu (2015) looked into the determinants of financial performance in general insurance companies, and in Ghana, Ansah-Adu *et al.* (2011) also looked into the cost efficiency of Insurance Companies. These studies found that insurance premium and the extent of debt and equity were major determinants of performance.



Source: 2010-2015 NIC Reports

Figure 1. Growth rate trend for Insurance Brokers and Insurance Companies

These studies, however, were focused on insurance firms without including insurance brokers. Therefore there is a gap in the literature. This study seeks to fill this gap by examining the performance and the determinants of performance of insurance brokers in Ghana. As the insurance brokerage industry continues to grow, the role of the insurance sector

becomes more and more important. Performance becomes important and factors that influence it needs to be well researched.

1.2. Purpose and Scope of the Study

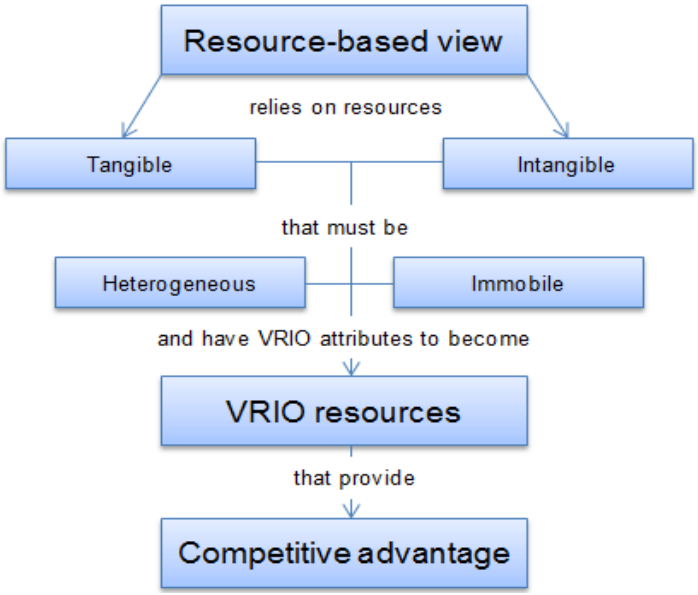
Specifically, the study seeks to identify the firm-specific factors that determine the insurance broking firms' profitability. As a control variable, we include macroeconomic factors and examine their effect on insurance broking firms' profitability. This study limits its scope to the insurance brokerage sector. Performance is measured by profitability, using ROE (Return on Equity) and ROA (Return on Assets). The panel data consisting of 64 insurance brokerage firms in Ghana spanning from 2010 to 2015 is used for the study.

3. Literature review

This study integrates mainly RBV theory and its variant, the VRIO analysis to underpin the research.

Resource-Based View

The Resource-Based View (RBV) examines how firms use a mix of resources to gain competitive advantage. It postulates that institutions or corporations gain competitive advantage through the (valuable) resources they possess (tangible and intangible). From the perspective of a brokerage firm, firms must possess unique resources in order to stand out and command the market. The firm should examine its resources; whether it is unique, valuable and difficult to imitate or copy (Barney, 1991). This theory relies on whether the resource is tangible or intangible, heterogeneous or immobile.



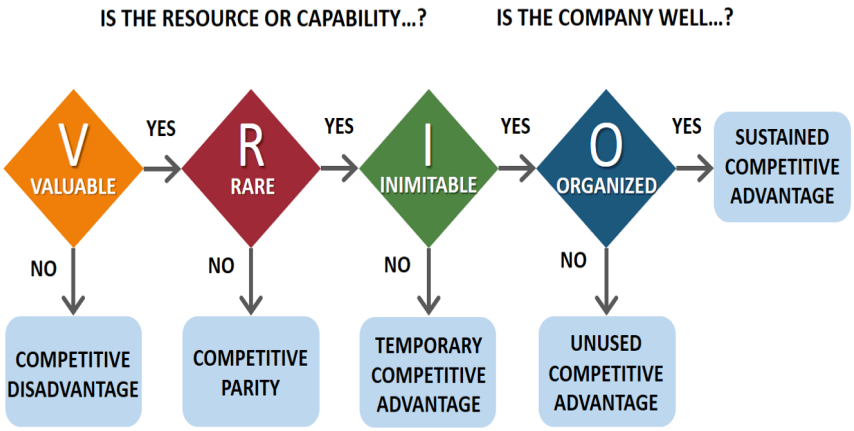
Source: https://www.strategicmanagementinsight.com/topics/resource-based-view.html

Figure 2. Resource-Based View

Resources may be in many forms: (1) Physical capital resources, which can be seen or felt, like physical technology-machinery, plant and equipment, etc.-, raw materials; (2) Human capital resources, which is usually learnt and transferred by observation and mimicking, like scientific know-how, industry knowledge, professional experience, relationships and insight that managers and employees harness; (3) Organizational capital resources, like the firms organizational structure and culture, procedural and coordinating structures planning and grapevine present in an organization; (4) Intangible assets, like intellectual property, brand recognition or innovative capability; (5) Financial resources, like cash in hand and liquidity, ability to secure external funding at favourable or below market rates and external funds like equity (Barney, 1991; Chatterjee and Wernerfelt, 1991). The RBV explains how well-positioned firms can leverage their resources to make profit.

We incorporate the VRIO strand into RBV. VRIO analysis seeks to look beyond just competitive advantage because they change easily or over time (Chatzoglou *et al*., 2018; Knott, 2015). Thus, it focuses on if the company has a sustained competitive advantage. VRIO uses an internal analysis approach using a series of questions highlighting the Value, Rarity, Imitability, and Organization of the institution (Knott, 2015). We link this to the firm's profitability; brokerage firms with sustained resources will be profitable. The level of the profitability of the firm is determined by its revenue generation and

efficient management of its expenditure. These two main factors (revenue and expenditure) and other specific firm characteristics, industry factors and macroeconomic variables affect the performance of firms (Buyinza *et al*., 2010).



Source: https://www.business-to-you.com/vrio-from-firm-resources-to-competitive-advantage/

Figure 3. VRIO Framework

The key firm-specific variables which could be controlled by management entail size, growth in sales, capital, efficiency, and management of risk. According to Demirguc-Kunt and Maksimovic (1998), there is a significant positive correlation between size and profitability. Asimakopoulos *et al*., (2009) suggest that the profitability of firms is positively affected by its size, growth in sales and investment. They also discovered that leverage and current assets are negatively related to performance. Insurance firms that have adequate capital are to meet their regulatory capital requirement and also possess additional funds to lend to other institutions to generate income. Additionally, adequately capitalized insurers are able to increase their earnings from underwriting by undertaking larger capital intensive investment in the oil and gas industry and several others.

Retention ratio is observed to be one of the determinants of profitability of insurance companies. This ratio measures the portion of an underwritten business that is not transferred to reinsurers. A higher retention ratio accompanied by a lower ration of claims is more likely to have a positive effect on the profitability of insurers (Pervan *et al*., 2012). Theoretically, an efficient insurance firm would have growth in its profitability due to its ability to maximize the usage of net premiums and net underwriting incomes. In the case of Insurance Brokers, there is not the case where part of their commissions earned are paid out, except for the payments to settle agents and special marketing executive consultants that are engaged to sell the services of the insurance broker to clients.

In Molyneux and Thornton (1992), they found that there is a significant positive association between profitability and efficiency. Deficiencies in the credit risk management that surrounds lending lead to high premiums outstanding and as such could negatively affect the maximization of profit. For instance, in Miller and Noulas (1997), an inverse correlation was identified between credit risk and profitability. In assessing the effect of financial mediation on the profitability of the insurance industry of Nigeria, Agiobenebo and Ezirim (2002) present a strong positive relationship between the level of premiums to total assets and the profitability of insurers.

According to Chen and Wong (2004) investment, size and liquidity are significant factors that determine the profitability of insurers. However, Ahmed *et al*. (2011), in a similar study on the life insurance industry of Pakistan, suggested that liquidity is not a significant determinant of the profitability of insurers. They added that, whereas risk and size (loss ratio) are positive and significantly related to insurance firms' profitability, leverage has an inverse relationship and as such leads to a decline in the profit of insurers.

Although there aren't many studies on determinants of profitability of insurance brokerage companies, there is quite a number on insurance companies in general. A number of them are discussed below:

In 2015, Mwangi and Murigu researched into The Determinants of Financial Performance in General Insurance Companies in Kenya. The study, which considered all the general insurance companies in Kenya from 2009 to 2012, used return on assets as its independent variable. The study adopted a descriptive research design and employed a multiple regression analysis model. The results of the research showed that profitability was positively related to equity capital, leverage and management competence index, and negatively related to size and ownership structure. There was no relationship

between financial performance and retention ratio, liquidity, underwriting risk and age. The study recommended that for general insurers in Kenya to perform better they should increase leverage, equity capital and quality of staff.

Cekrezi (2015) explored the factors that affect the financial performance of Albanian Insurance Companies. The study employed cross-sectional time series data of 5 insurance companies with private capital. The results showed that leverage (total debt to total assets) and risk (standard deviation of sales to the average value of sales) have a negative impact, and tangibility (fixed assets to total assets) has a positive impact on the financial performance (ROA) of these companies.

Charumathi, in 2012, also conducted an empirical study on the Determinants of profitability of Indian Life Insurers. Using Return on Asset as the dependent variable, the study sampled all the 23 Indian life insurance companies (comprising 1 public and 22 private companies) and used data pertaining to 3 financial years that is 2008 to 2009. The independent variables used were leverage, size, premium growth, liquidity, underwriting risk and equity capital. After regressing the independent variables against the Return on Assets, the study concluded that the profitability of life insurers is positively and significantly influenced by the size and liquidity. Further, leverage, premium growth and the logged values of equity capital have a negative and significant influence on the profitability of Indian life insurers. The study did not find any relationship between underwriting risk and profitability.

In Ghana, there have been studies on the financial performance of Life Insurance companies. In 2013, Akotey, Sackey, Amoah and Manso examined the three measures of insurers' profitability, which are investment income, underwriting profit and net profit. The findings indicated a positive relationship between gross premium and insurers' sales profitability; however, its relationship with investment income is a negative one. Contributing to this was the continual reporting of underwriting losses due to overtrading and price undercutting. The results further revealed a setting-off rather than a complementary relationship between underwriting profit and investment income towards the enhancement of the overall profitability of life insurers.

Ismail (2013) did a paper to investigate the determinants of the financial performance of general Islamic and conventional insurance companies in Malaysia using panel data over the period of 2004 to 2007. The investment yield was used as the performance measure. Other economic and firm-specific variables employed were the profit/interest rate levels, equity returns, size of the company, retakaful/reinsurance dependence, solvency margin, liquidity, and contribution/premium growth. Three models of panel data estimation were employed for the study. Based on the empirical results, the study showed that size of the company, retakaful dependence and solvency margin are statistically significant determinants of the investment performance of the general Islamic insurance companies in Malaysia, however for conventional insurance; all factors are statistically significant determinants of investment performance, except for equity returns.

Another key determinant of performance is the efficiency and productivity of firms. This enables the ability to minimize cost, which is an alternative strategy to make profit. This is due to the fact that increment on expenditure actually drains the value of assets- while the other side is condemned. According to Biener *et al.* (2015), there has been an improvement in the productivity and efficiency among insurance firms globally. This has enhanced the profitability of insurance firms. However, there is a diminishing in the productivity and efficiency of life insurance firms. Life insurance firms that have international business lines, on the other hand, recorded higher levels of efficiency and higher performance. This makes the desire to analyse the determinants of the performance of insurance brokers an imperative.

Using a cross-sectional data set of 30 firms over the period 2006-2008, Ansah-Adu *et al.* (2011) evaluated the efficiency scores of Ghanaian insurance firms by applying a data envelopment analysis that allows the inclusion of multiple inputs and outputs in the production frontier. The study also employed a regression model to identify the key determinants of the efficiency of the Ghanaian insurance industry. The empirical results showed higher average efficiency scores for life insurance companies than non-life insurance companies for the first stage. In the second stage, the authors observed that the drive for market share, firm size and the ratio of equity to total invested assets are important determinants of an insurance firm's efficiency.

4. Methodology of research

The study adopts a quantitative framework using annual secondary data on brokerage firms. An unbalanced panel data is extracted from 64 Ghanaian based insurance brokerage firms over the period 2011-2015. Specific firm-level variables, generated from yearly data extracted from the firms' financial statements, are used in the study to examine how firm-level characteristics affect profitability. Two macroeconomic variables are added as control variables.

The study also adopts a modified version of the econometric model used by Kozak (2011) and Ahiawodzi and Sackey (2010) in identifying the determinants of profitability. The panel regression model takes the form:

$$Y_{it} = \{X_{it}, Z_t\} + \varepsilon_{it} \quad (1)$$

Where Y_{it} represents the profitability of insurance broker i over year t, X_{it} denotes a vector of variables of the characteristics of insurance broker i over year t and $Z_t$is the vector of variables representing the economic data of Ghana in year t. ε_{it} is the error term. The empirical models are specified in the following equations:

Model I

$$ROA_{it} = \partial + \beta_1 TDTA_{it} + \beta_2 TANG_{it} + \beta_3 FLEX_{it} + \beta_4 SIZE_{it} + \beta_5 RISK_{it} + \beta_6 INFLATION_{it} + \beta_7 GDP_{it} + \varepsilon_{it} \quad (2)$$

Model II

$$ROE_{it} = \partial + \beta_1 TDTA_{it} + \beta_2 TANG_{it} + \beta_3 FLEX_{it} + \beta_4 SIZE_{it} + \beta_5 RISK_{it} + \beta_6 INFLATION_{it} + \beta_7 GDP_{it} + \varepsilon_{it} \quad (3)$$

The equation contains nine (9) variables; the ROA- Return on Assets, ROE- Return on Equity, TDTA- Total Debt to Total Assets, TANG- Fixed Assets to Total Assets, FLEX- Current Assets to Total Assets, Size- Size of the Firm, Risk- Firms Risk, Inflation, and GDP- Gross Domestic Product.

ROA and ROE are measures of profitability, ∂ is the constant term, β_1, β_2, β_3, β_4, β_5, β_6, and β_7 are the coefficients or parameters of the respective variables, the subscript "t" denotes time and "i" firms. "$\boldsymbol{\varepsilon}$" is the error term.

*Table 5.*Variables

Symbol	Meaning and interpretation	Source
ROA (dependent variable)	Return on Assets. Measures how efficient management is in using the firm's assets to generate returns. Formula; $ROA = \frac{Net\ income\ or\ Earnings}{Total\ Assets}$	Firms Annual Financial Statements
ROE (dependent variable)	Return on equity. Measures the returns management get from the total equity invested by shareholders. Formula; $ROE = \frac{Net\ income\ or\ Earnings}{Equity}$	Firms Annual Financial Statements
TDTA (variable of interest)	Total debt to total assets. Measures the total debt of the brokerage firm as a ratio to its total assets	Firms Annual Financial Statements
TANG (variable of interest)	Fixed assets to total assets. This measures the amount of tangible assets kept by insurance brokers.	Firms Annual Financial Statements
FLEX (variable of interest)	Monetary assets to total assets. The variable also measures how much of the total assets are not fixed assets (or current assets).	Firms Annual Financial Statements
SIZE (variable of interest)	Natural logarithm of total assets. This variable is employed as a proxy to measure the size of the brokerage firm.	Firms Annual Financial Statements
RISK (variable of interest)	Standard deviation of EBIT to average value of EBIT. This variable as a proxy for measuring risk of the brokerage firm.	Firms Annual Financial Statements
INFLATION (control variable)	Inflation. Measured as a percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services at specified intervals.	World Bank Database
GDP (control variable)	Gross domestic product (GDP). It's the monetary value of all the finished goods and services produced within a country's borders in a specific time period	World Bank Database

Source: Authors own.

The data used for the study has been uploaded online (http://dx.doi.org/10.17632/gx572w29sr.2) and can be retrieved from the Mendeley database (Kotey and Owusu-Sekyere, 2019).

5. Analysis and Presentation of Findings

5.1. Descriptive statistics

Before running any analysis, descriptive statistics on the variables are discussed to present the statistical view of the variables.

The mean for the TDTA stands at 29% which means about 29% of total assets is accounted for by debt. That also implies that about 70% of that total asset is accounted for by equity. The TANG mean of 37% also means fixed assets account for 37% of the total assets. This also implies current asset accounts for about 63% of total assets. Indeed, the mean of FLEX affirms this.

Table 6. Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
ROA	214	0.0853856	0.3111259	-2.155652	0.8103704
ROE	214	0.0096823	1.19501	-13.21498	0.9516071
TDTA	214	0.2952607	0.2862047	-.1627625	1.833533
TANG	215	0.3715845	0.302567	-.4162825	0.9793391
FLEX	215	0.6284155	0.302567	0.0206609	1.416283
SIZE	215	12.82397	1.274312	10.15929	16.77118
RISK	307	1.559456	7.087198	-42.3689	95.76586
INFLATION	335	0.124269	0.033723	0.087268	0.171451
GDP	335	0.07712	3.775373	0.0392	0.1405

Source: Authors own computation.

This data shows that the firms are more liquid or hold more liquid assets than fixed assets. When we compare the means of ROA and ROE, which is 8.5% and 1% respectively, we can tell that on average the return on assets far exceeds the return on equity. The mean of size, compared with the intervals also shows that the average size of the brokerage firm is relatively small with a few outliers who are bigger. Inflation averaged 12.42% within the period under study whilst GDP growth rate averaged 7.7%.

5.2 Pearson Correlation matrix

The table below presents the Pearson correlation table for the variables. As a check, we also run a pairwise correlation using listwise deletion to control for missing values and a Bonferroni-adjusted significance level to give more significant results (we did not present in the paper). The results were similar to the Pearson correlation results.

So far, the first (ROA) and second (ROE) columns indicate that our dependent variables are weakly correlated with our independent variables (TDTA, TANG, FLEX, SIZE, RISK, INFLATION, and GDP) showing that multicollinearity may not exist in the data set so we further test for VIF.

We see from the table that ROA and ROE are strongly correlated with a correlation coefficient of 0.82, which is expected because they both measure returns in the study (thus both are dependent variables in our models). Also, our two control variables (GDP and inflation) are negatively but strongly correlated, which is not unusual. However, the control variables are not collinear with any of our variables of interest (see VIF test in appendix and correlation table); we further tested this by doing a VIF test on all our variables and discovered that two of our control variables had signs of multicollinearity (GDP had a VIF of 6.54 and inflation, 6.47), albeit none of them had a VIF of 10. Thus, because they are not our variables of interest and/or do not affect (or correlate with) our variables of interest, we can safely ignore them (Allison, 2012).

As eluded to, because simply observing the correlation coefficients among the pairs of predictors is not a sufficient check of multicollinearity, we perform a VIF test on our variables of interest (presented in the appendix). The mean VIF was 1.05 which means the variances of the variables are averagely inflated by about 5% which falls within an acceptable region. Therefore we proceed to say issues of multicollinearity have been checked in the data.

ROA is also negatively correlated with TANG and TDTA but positively correlated with FLEX, a weak relationship in both cases. Indicating that an increase in debt and fixed assets affect returns negatively. ROA is also negatively correlated with inflation albeit a weak relationship. We, however, expected the relationship to be negative because a rise in inflation would affect returns negatively. RISK and ROA are also weakly but positively correlated, showing that a rise in risk levels raises profits although weakly. GDP is also positively correlated with ROA but the relationship is very weak.

ROE is also weakly and negatively correlated with TDTA and negatively correlated with TANG, just like the ROA. SIZE and ROA are also weakly positively related. ROE and GDP are also weakly and positively related. With inflation and ROE, the effect is negative although weak relationship. GDP and inflation are also negatively but strongly correlated with a coefficient of 0.89.

Inflation also is negatively but weakly correlated with ROA, ROE, TDTA, and FLEX. But it's positively correlated with TANG, SIZE and RISK. So when inflation increases, our return on assets and equity all decrease. TDTA, FLEX and RISK also decrease. But TANG, which captures fixed assets increases when inflation increases.
GDP growth also has a negative effect on TANG and SIZE although the effect is weak. Inflation and GDP growth rate are macro-economic variables so their effect is not direct. Hence the weak correlation coefficient, so GDP positively although weakly affects ROA, ROE, TDTA, and FLEX. GDP growth has a positive effect on ROA than ROE.

Table 7. Pearson Correlation Matrix

	ROA	ROE	TDTA	TANG	FLEX	SIZE	RISK	INFLATION	GDP
ROA	1.0000								
ROE	0.8217	1.0000							
TDTA	-0.2419	-0.2666	1.0000						
TANG	-0.2254	-0.1049	-0.0417	1.0000					
FLEX	0.2254	0.1049	0.0417	-1.0000	1.0000				
SIZE	0.2225	0.2195	0.2395	0.1170	-0.1170	1.0000			
RISK	0.0033	0.0189	0.0439	-0.0454	0.0454	0.0707	1.0000		
INFLATION	-0.0928	-0.0786	-0.0930	0.1240	-0.1240	0.1624	0.0179	1.0000	
GDP	0.0748	0.0545	0.0872	-0.1167	0.1167	-0.1855	-0.0704	-0.9181	1.0000

Source: Authors own

SIZE also positively but weakly affects all the variables with the exception of FLEX. So when the firm's size increase, their ROA and ROE increase, their total debt and fixed asset also increases. But their current assets (FLEX) reduces. We also see from the table that TANG and FLEX are strongly negatively correlated. RISK and TDTA are also positively but weakly related. RISK and TANG also exhibit a negative relationship although the effect is weak.

5.3. Regression results

After testing for the appropriate model using the Hausman test as a model specification, we found that a Fixed Effects regression model is appropriate for model 1 (ROA) and Random Effect appropriate for model 2 (ROE). Next, we tested for heteroscedasticity using the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity and found that our standard errors are biased therefore we used robust standard errors in our regression to correct for this. We run 4 regressions; regressions 1 and 2 using normal standard errors, and the 3 and 4 are with robust standard errors.

Table 8. Results of Random and Fixed Effects Estimation

			ROBUST STANDARD ERROR	
	(1)	(2)	(3)	(4)
	Fixed Effects	Random Effects	Fixed Effects	Random Effects
VARIABLES	ROA	ROE	ROA	ROE
TDTA	-0.411***	-1.058***	-0.411**	-1.058
	(0.0882)	(0.186)	(0.187)	(0.661)
o.TANG	-	-0.401**	-	-0.401***
		(0.176)		(0.149)
o.FLEX	0.167	-	0.167*	-
	(0.111)		(0.0902)	
SIZE	0.226***	0.223***	0.226**	0.223**
	(0.0459)	(0.0441)	(0.0884)	(0.111)
RISK	-0.000905	2.82e-05	-0.000905	2.82e-05
	(0.00226)	(0.00643)	(0.00112)	(0.00278)
INFLATION	-0.0252*	-0.0482	-0.0252	-0.0482
	(0.0132)	(0.0382)	(0.0170)	(0.0425)
GDP	-0.00582	-0.0130	-0.00582	-0.0130
	(0.0133)	(0.0395)	(0.0126)	(0.0277)
Constant	-2.418***	-1.600*	-2.418**	-1.600*
	(0.609)	(0.948)	(1.038)	(0.941)
Observations	206	206	206	206
R-squared	0.28	0.26	0.28	0.26
Number of firms	64	64	64	64

Standard errors in parentheses

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

Our results show that TANG and FLEX are omitted from model 1 (ROA) and model 2 (ROE) due to collinearity with other variables in the regression. Model 3 and 4 are our main regression models because they have robust standard errors but we juxtaposed them with models 1 and 2, which don't have robust standard errors, for comparison. We see from the

regression table that the FLEX and TANG coefficients for both model 1 and 3, and 2 and 4 are the same, however, the level of significance differ. The R squared for the regression models range from 26% to 28%. The low R squared is expected for the data set we used; thus panel data of firms are usually low. This means that in regressions 1 and 3, 28% of the variation in the independent variables is explained by the dependent, whilst for regressions 2 and 4, the percentage of explained variation is 26%. However, the F probability, which tests the overall significance of the regression model, was positive and significant in all the regressions models. The F probability tests the null hypothesis that the regression betas are equal to zero. So in all the models, we reject the null hypothesis.

In model 1 (regression 1 and 3), TDTA has a negative coefficient of 0.411 which is significant at 1% and 5% significant level respectively. The interpretation is that ROA and TDTA exhibit an inverse relationship. Cekrezi (2015) found a similar relationship. Thus total debt has a negative impact on ROA. The standard error, however, is much higher for regression 3 with the robust standard errors. The negative relationship also appears in model 2 (regression 2 and 4). However, the TDTA is only significant at 5% in model 2 and not 4 when the standard errors are robust. Also, the coefficient was much larger when compared to model 1, but because it is not significant with robust standard errors, we do not use the interpretation.

TANG also has a negative relationship with ROE in both models 2 (regression 2 and 4). And in both regressions, they are significant at 5% and 1% respectively. The interpretation is the effect of an increase in fixed assets is negative ROE. The standard error reduces when robust standard errors are factored in (regression 4). This relationship is inverse of what Cekrezi (2015) found; in his finding, TANG had a positive relationship with ROA.

FLEX also had a 10% significance and it was positively related to ROA whilst omitted in model 2 (ROE) which is also an indication that monetary assets do affect positively returns (ROA). This positive relationship is supported by the findings of Charumathi (2012).

SIZE is significant and positively related in both models. It is significant at 1% significance level in regressions 1 and 2 but reduces to 5% when standard errors are used (regressions 3 and 4). Looking at the coefficients of model 1 and 2, we see that the effect of SIZE on the ROA and ROE are almost the same, with the effect on ROE slightly lower. This finding is supported by Mwangi and Wurigu (2015). The standard error in each case is also very small, indicating a very small variation in the coefficient.

The firm RISK also negatively affected ROA in regression 1 and 3 but the effect reversed to positive in regression 2 and 4. However, the coefficients were not significant in all 4 regressions. This relationship is also supported by Cekrezi (2015) although, in their model, the relationship was significant. Inflation and GDP are macro-economic variables and as such their effect was not so direct, so we expected very small coefficients, which the tables showed to be true. However, their P values were more than 5%. Inflation negatively affected ROE and ROA in both models 1 and 2, but only significant in regression 1. The negative relationship is expected since high inflation would affect the firm's returns but since it's not significant when robust standard errors are used, we do not use it in our explanation. GDP also has a negative relationship on ROA and ROE but again, the effect is weak and not significant.

6. Summary of findings

The study mainly sought to examine how firm-level factors determine the profitability of brokerage firms in Ghana. Additionally, macroeconomic factors or variables were added to the model to see how macro factors also affected profitability. Descriptive statistics showed that averagely the brokerage firms held more equity than debt and more current assets than fixed assets within the time frame under study. Additionally, GDP stood averagely at 7.7% and inflation 12.4%. Average Size of insurance brokerage firms was also seen to be relatively smaller with a number of outliers being bigger.

The Pearson Correlation Matrix also showed that ROA and ROE were highly correlated. We used them as measures of firm profitability for the study. However, ROE was more correlated to firm RISK than ROA, albeit a weak correlation in both cases. GDP was weakly correlated with ROA showing insurance brokerage returns were not very much affected by economic performance. Inflation also exhibited the same weak correlation albeit weak in this case. Based on the data, we can say that macro-economic factors do not strongly affect the returns of insurance brokerage firms.

The results of the FE and RE regressions also showed that total debt (TDTA) negatively affected ROA at 5% significance level but not ROE, which was not significant. Fixed assets (TANG) negatively affected return (ROE) and was significant at 1% even with robust standard errors. Size on the other hand, significantly affected (at 1% significant) profitability of insurance brokerage firms in Ghana. FLEX also positively affected ROA, at a 10% significance level. The study observed no significant relationship between GDP, risk and inflation on profitability. This implies that insurance brokerage firms are largely affected and in varying degrees by debt, liquidity and size of assets.

7. Conclusions

The insurance sector plays significant roles in the development of economies which include; effective allocation of resources, reduction in transaction cost through signing on a particular insurance package, improved liquidity in the economy, facilitating economies of scale and the mitigating the impact of financial losses. In achieving these, the insurance brokerage sector plays a very significant role in managing the risk and uncertainties of market players creating a harmonious environment for trade and commerce. Because of this, there is the need to ensure insurance brokers perform effectively and efficiently to enhance their profitability, survival and growth. If this is done in Ghana, it will go a long way to ensure the sustainable development of the financial services sector and support the growth agenda of the government of Ghana. Even though insurance brokers are not seen as significant contributors to the economy, they affect the economy through their effort in reducing trade risks that directly impact growth.

8. Recommendations

Examining the roles played by insurance brokerage firms in helping individuals and businesses manage their risk, there is the need for government as well as other policy-making and implementation units to adopt strategies to ensure the sector is more resourced. This will enhance their ability to develop and be more useful to the growth processes of the economy. Also, the span of operations could be clearly defined with a detailed approach to enhance the ability of brokerage firms to play their roles. This will reduce malpractices in the sector such as overtrading and low balling which affect their ability to pay claims and achieve sustainable growth. The data showed that the insurance brokerage sector is more equity-based than debt. Therefore there must be structures in place to ensure management are not allowed to use accumulated earnings to pay extremely high dividends. Rather, since size positively affects profitability, firms should reinvest annual earnings to enable the firms to build a sufficient asset base to increase revenue. Since debt and fixed assets adversely affect revenue, there must be policies to regulate how much debt the firm can take on at a time or how much fixed assets it can acquire. This will reduce the propensity to take on more debt or lock up capital in fixed assets thereby easing pressure on revenues.

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Appendix

Hausman Test

We conducted a Hausman test on the two models to see if fixed or random effects regression model is appropriate for the analysis. The null hypothesis for the test states that the difference in coefficients not systematic whilst the alternate hypothesis states that the difference in coefficients is systematic. We run the test on both models. The tables are presented below;

Model 1 (ROA)

The Hausman test results for model 1 is presented below:

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
TDTA	-.4113307	-.4142296	.0028989	.0506058
SIZE	.2261929	.109845	.1163479	.0410144
RISK	-.000905	-.0011517	.0002467	.0004805
inflation	-.0251662	-.0159689	-.0091973	.0034225
GDP	-.0058215	-.0045878	-.0012336	.0016213

$chi2(5) = (b - B)'[(V\_b - V\_B)^(-1)](b - B)$ = 34.26

$Prob > chi2 =$ 0.0000

$Test: Ho: difference\ in\ coefficients\ not\ systematic$

The P value for the test is less than 0.05. This means it is significant so we reject the null hypothesis and conclude that the difference in coefficients is systematic. Therefore a fixed effects estimation model is appropriate.

Model 2 (ROE)

The Hausman test results for model 2 is presented below:

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	roefe	roere	Difference	S.E.
TDTA	-1.334407	-1.058382	-.2760259	.1855351
SIZE	.6440893	.2230828	.4210064	.1297547
RISK	-.0003663	.0000282	-.0003945	.0020212
inflation	-.1005913	-.0481779	-.0524133	.0090546
GDP	-.0330709	-.0130281	-.0200429	.0017308

$chi2(5) = (b - B)'[(V\_b - V\_B)^(-1)](b - B)$ = 7.62

$Prob > chi2 =$ 0.1787

The P value for the test is greater than 0.05. This means it is not significant so we fail to reject the null hypothesis and conclude that the difference in coefficients is not systematic. Therefore a random effects estimation model is appropriate.

Test for Heteroscedasticity

As a pre-estimation test, we test for heteroscedasticity by conducting the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. This test checks if the standard errors are biased or not. A biased standard error indicates that the independent variables may be heteroscedastic. The null hypothesis is the variance the errors are constant and the alternate hypothesis is the variances are not constant. We run the test for both models;

Model 1 (ROA)

The test results are presented below;

$chi2(1) = 141.58$

$Prob > chi2 = 0.0000$

The P value is less than 0.05 which means it is significant so we reject the null hypothesis and conclude that the errors do not have a constant variance. To correct for this we have to use models with robust standard errors.

Model 2 (ROE)

The test results for model 2 are presented below;

$chi2(1) = 877.84$

$Prob > chi2 = 0.0000$

In model 2 as well, the P value is less than 0.05 which means it is significant so we reject the null hypothesis and conclude that the errors do not have a constant variance. To correct for this we have to use models with robust standard errors.

VIF test

The Variance Inflation Factor measures how much the variance is inflated, which in effect tests for multicollinearity as variables with inflated variances are multicollinear.

We conducted a VIF test on our independent variables (variables of interest). The findings are presented in the table below;

Variable	VIF	1/VIF
SIZE	1.08	0.922145
TDTA	1.07	0.937158
TANG	1.02	0.978469
RISK	1.01	0.991510
Mean VIF	1.05	

The VIFs for each of the predictors were between 1.01 and 1.08, which are very low. The standard practice that VIFs of 4 and above need to be further investigated, whilst those exceeding 10 are signs of serious multicollinearity requiring correction. Since all our variables have VIFs less than 1.10, there are no multicorrelation in our variables.