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Analysis of Factors Affecting Outstanding Claim Provision of Non-Life Insurance Firms in Ghana

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Abstract: *This study investigated the determinants of estimating outstanding claim provision of non-life insurance firms in Ghana. The study is based on panel data of non-life insurer's outstanding claim provision, underwriting premium, reinsurance premium, paid claims and size of firm as well as macroeconomic variables such as inflation, investment rate and real GDP growth rate for 22 non-life insurance firms covering the period 2007-2012. The study fitted a fixed effect regression model which helped overcome simultaneity bias and gave consistent estimates. The results show that claims paid, reinsurance issued premiums and the lag of outstanding claim provision is negatively related to reported outstanding claim provision. Size and the real GDP growth rate were also found to be positively related with reported outstanding claim provision in the Ghanaian non-life insurance industry. The study based on the findings recommends that regression modelling may be applied in estimating outstanding claim provision in Ghana. The lag values of the outstanding claim provision should be factored in future estimations of outstanding claim liabilities and monitoring efforts by regulatory bodies should factor in avenues of checking on the insurer's data recording. This is because information on previous year's outstanding claim provision is observed to have an impact on the current outstanding claim provision.*

Keywords: *Outstanding claim, Solvency, Non-life insurance, Underwriting premium, Reinsurance premium, Paid claims.*

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I. Introduction

[1]Defined outstanding claim provision as an amount carried in the liability section of a risk-bearing entity's balance sheet for claims incurred prior to a given accounting date, where liability as used in the definition is the actual amount that is owed and will ultimately be paid by a risk-bearing entity for claims incurred prior to a given accounting date.

Claim settlement is very vital in the execution of any insurance policy. For this reason, the National Insurance Commission of Ghana (NIC) by law (NIC Act 2006, Act 724) requires that Insurance companies carry adequate outstanding claim provision on the company books at the end of the accounting period. The regulators are very much concerned with the insurer's solvency position because the protection of the policyholders is of prime importance to the regulator as well as the protection of investors and other stakeholders by ensuring that the insurer does provide an accurate representation of their financial standing.

The requirement for outstanding claim provision is due to the delay between the claim event date and the claim settlement date. This delay depends on how long it takes from the day a loss occurs until the claim is settled and paid out to the policyholders. It may take a long time from the loss event to the reporting of the loss to the company, or it can take a long time from the day of reporting until the company knows the ultimate cost of the claim [2]. Therefore the law requires that Non-life insurers must establish the required outstanding claim provision to meet their liabilities to policyholders and beneficiaries in terms of Incurred But Not Reported Outstanding claim provision (IBNR) and Outstanding Claim Provision for the reported losses (OCP).

The estimation of IBNR is generally subject to a greater degree of uncertainty than the estimation of the cost of settling claims already notified to the company, where information about the claim event is available. IBNR claims may not be apparent to the insured until many years after the event that gave rise to the claims. For casualty contracts, the IBNR proportion of the total liability is high and will typically display greater variations between initial estimates and final outcomes because of the greater degree of difficulty of estimating these liabilities [3].

It is extremely unlikely that the carried total outstanding claim provision will ever be the precise amount necessary to settle all the claims for which it is meant to provide and it is as well important to note that any outstanding claim provision under-statement ultimately reduces the insurer's liabilities thereby boosting up its net income. Over-statement, on the other hand will have an opposite effect and a direct influence on the income statement, shareholder confidence and inadequate future premium income [4]. The effect of outstanding claim provision inadequacies can significantly be the main cause of bankruptcy of an insurance industry, hence, failure to detect manipulation in time, will expose investors and other stakeholders to a large insolvency uncertainty. The conference of Consulting Actuaries (1992) reports that for the period 1987-1991, a total of 164 U.S. property-casualty insurance companies were declared insolvent. The leading cause of the insolvency according to the report was under provision.

Legally, insolvent insurance companies are not allowed to continue to sell insurance policies because it does not have the financial strength to keep its contractual obligations to its policyholders [5]. Apart from that, outstanding claim provision has important implications for insurers pricing and competitive responses. If the estimate of outstanding claim provision were too low, premiums would be inadequate to support the financial projections of future periods.

In the worst case scenario, rate would be insufficient to pay claims and the company would be insolvent, if the outstanding claim provision were too high, consequently, insurance rates may be raised above competitive levels [6]. Therefore, non-life insurance firms need to be able to estimate outstanding claim provision to make sure that they have sufficient assets to cover their liabilities.

Despite the importance of this topic it appears little is known about the nature of the subject in the Ghanaian non-life insurance industry. [7]investigated the Outstanding Claim Provision Variability and Outstanding Claim Provision Errors in the Ghanaian Property and Liability Insurance Industry. This study concentrated on the determinants of outstanding claim provision errors but in order to minimize these errors it is important to consider the factors that affect the estimation of the outstanding claim provision. Therefore, the current study seeks to add to existing knowledge on outstanding claim provision estimation by using a panel regression method which combines the strength of Cross Sectional and Time Series analysis and also gives a superior identification and measurement of those effects which are not observable either with cross sectional or time-series analysis only [8].

Outstanding claim provision could adversely affect the financial strength of the insurer and possibly lead to insolvency [9], thus accuracy of outstanding claim provision is an important concern to both regulators and stockholders of non-life insurers. However, some factors have been identified as having a key influence on outstanding claim provision estimation. This study therefore has the main objective of examining the factors influencing outstanding claim provision of non-life insurance firms in Ghana, using a panel data covering the period 2007-2012.

II. Literature Review

Insurance solvency is important for economic reason which arises from market failures created by costly information and agency problems. Owners of insurance companies have diminished incentives to maintain a high level of safety to the extent that their personal assets are not at risk for unfunded obligations to policyholders that would result from insolvency. It is costly for consumers to properly assess an insurer's financial strength in relation to its prices and quality of service. Principal-agent conflicts also exist in that insurers can increase their risk after policyholders have purchased a policy and paid premiums. The moral hazard associated with these conditions is exacerbated by

insolvency guarantees that further reduce buyers' incentives to monitor and consider the financial strength of insurers [10].

The purpose of solvency regulation in theory is to limit the degree of insolvency risk in accordance with regulators preference for safety. Regulators may achieve this objective by requiring insurers to maintain a minimum amount of capital and meet other financial requirements. Insurance regulators may also balance various goals in maximizing social welfare. Regulation affects the range of possible values of the risk-return tradeoff involved with insurance transactions. Greater flexibility with respect to solvency requirements allows insurers to offer a wider range of possible product options and allows consumers to incur greater risk in return for lower prices and/or higher benefits [11]

Tighter solvency standards will tend to reduce the supply of insurance and increase its price. In turn, restrictions on insurers' prices and market practices can impair solvency. Policymakers and regulators must ultimately determine the boundaries governing firm and consumer choices in promoting the public interest [12]. According to the IAIS (2013) solvency assessment results from the application of supervisory judgment to various measures and estimates of an insurer's current financial position and future financial condition which serve to demonstrate the insurer's ability to meet its policyholder obligations when they fall due hence the importance of outstanding claim provision in insurance business.

Outstanding claim provisions are estimates of what claims will cost and constitute a very important part of insurance solvency. The provision represents money that is set aside to meet claims arising in the future on the policies already written [13]. The outstanding claim provision forms a significant component of the insurer's liability and implicitly determines the general provision which the insurer maintains towards future claim settlement. The adequacy of this provision for non-life insurers constitutes a significant component when considering the determination of insurer profitability and business continuity [14]. However, the implicit uncertainty with reference to determination of an insurer's outstanding claim provision has direct implications for its required surplus, company's profitability, rate making and reinsurance demand ([4]; [14]).

Two basic types of provision have been identified and consist of those relating to premiums and those relating to claims. [15]referred to premium provision to be inclusive of both "provision for unearned premium" (that which constitutes a provision for the proportion of premium that has not yet been earned as at the time of estimation) and "unexpired risk provision" (that set aside for periods when an insurer anticipates a shortfall in rates as a result of a soft market). On the other hand, claim provision is known to comprise "outstanding claims provision" (representing the money put aside for paying claims on written businesses whether or not they have been reported to the insurer). The provision for known claims represents the amount of paid loss that will be required to settle all reported claims not including payments already made on these claims.

The IBNR provision represents the amount of paid loss that will be required to settle all incurred but not reported claims. Like the total outstanding claim provision, these two provisions can be discussed in terms of required, carried and estimated. The concepts of outstanding claim provision date, evaluation date, prospective and retrospective estimate, developed provision, and provision test all apply to the IBNR and provision for known claims. The total provision provides for payments subsequent to a given date on claims occurring prior to this date. This date is called the provision date. The evaluation date for an outstanding claim provision means the date of the most recent accounting or statistical data entering the calculation [13]. Most non-Life insurance firms in Ghana use the IBNR in estimating outstanding claim provision.

Outstanding claim provisions are normally the largest item on a general insurer's balance sheet. This is no different under Solvency II and confirms that the calculation of outstanding claim provisions will remain an essential component in the construction of solvency balance sheets. Solvency II intends the balance sheet to be a tool for management to assess their solvency and hence a key consideration for significant decisions. It will also be a tool for regulators to assess the solvency of the insurer.

A key consideration for management in making significant decisions will be the excess of the value of assets over outstanding claim provisions, other liabilities (such as outstanding tax payments) and the solvency capital requirement. This excess of "own funds", according to Solvency II over the solvency capital requirement will determine whether the insurer can expand existing business, move into new areas, consider mergers/acquisitions with less capital rich entities, etc, or whether they need to consider reducing the volume of business they write, moving out of more volatile, capital intensive types of risk, purchasing additional reinsurance, and so on. The level of own funds will also often impact an insurer's credit rating.

The outstanding claim provisions are a direct input into the balance sheet. They are therefore also a key input into the Solvency Capital Requirement (SCR) calculation which models the potential movement in the Solvency II balance sheet over a one year time horizon. Thus, if a company gets outstanding claim provisions wrong, there is a potential "double whammy" as the capital could equally be wrong. This would amplify the potential impact on the excess of own funds over the SCR. The consequences are that management and regulators could be significantly misinformed and the ramifications for the insurer severe. [16] argued that outstanding claim provision are affected by underwriting premiums, paid claims, surplus of insurance activity and reinsurance issued premium. According to him an increase in the amount of underwriting premium is expected to increase the units of risk and the number of claims, and therefore would increase the outstanding claim provision as well. He also assumed that an increase in the amount of paid claims at any year is due to an increase in the number of paid accidents, and this would result in a decrease in the amount of the outstanding claim provision.

As with the effect of reinsurance issued premiums on outstanding claim provision, [16] claimed that reinsurance treaties allow insurance companies to accept risks that would otherwise be rejected, resulting in greater size of the insurance portfolio, which then increases the loss probability and ultimately increases the outstanding claim provision. Based on fire insurance data in Misr Insurance Company (the largest fire insurance company in Egypt) within the period from 1986 to 1999, he revealed a significant positive relationship between underwriting premiums and outstanding claim provision, and a significant negative relationship between reinsurance issued premiums and outstanding claim provision. [17]in their study outstanding claim provision estimation based on cross sectional analysis of the Egyptian fire insurance segment estimated reported outstanding claim provision using cross sectional regression. Data for actuarial reserve estimation techniques was collected from the biggest governmental insurance company's (Misr Insurance Company) and for the total market. They tested variables including underwriting premiums, paid claim, reinsurance issued premiums, inflation rate, and the investment rate. The cross sectional regression results reviewed that only underwriting premium, paid claims and inflation rate are significantly related to the outstanding claim provision and found the relationship to be positive for underwriting premium and paid claims, and negative for inflation rate. [9], in her study, influence of economic factors on the smoothing of reported earnings through outstanding claim provision management in the automobile liability insurance industry used a sample of sixteen large automobile liability insurers. Based on pooled, cross-section time series regression for the period 1955-1975 she found a negative relation between interest rates/unexpected inflation and outstanding claim provision manipulation. According to her study when interest rates and unanticipated inflation increase, insurers tend to underestimate outstanding claim provision in reported financial statements. However, her work focuses entirely on automobile liability insurance.

Also,[18] proposed a Bayesian non-linear hierarchical model that addresses some of the major challenges that non-life insurance companies face when forecasting the outstanding claim amounts for which the companies will ultimately be liable. This approach enabled the study to carry out inference at the level of industry, company and/or accident year, based on the full posterior distribution of all quantities of interest. This approach allows for prior experience and expert opinion to be incorporated in the analyses through judgmentally selected prior probability distributions.

[7] Investigated the determinants of outstanding claim provision error of the Ghanaian property and liability (P&L) insurance industry. The study made use of information on insurer claim provisions,

claims outstanding, claims incurred and claims paid for the period of 2000-2010. Categorizing the sources of variation as endogenous and exogenous, the panel correlated standard error (PCSE) regression model was used to determine sources and magnitude of industry outstanding claim provision error. The study found size, age, lag of loss reserve error, inflation rate and real gross domestic product are significant in determining the degree of outstanding claim provision error variation. Type of ownership (domestic or foreign) is, however, not a significant source of variation. Further, they found that industry outstanding claim provision errors are random (not manipulated) across firms, suggesting that sampled insurers act independently on outstanding claim provision error decision making and are not influenced by industry trends and competition.

III. Materials And Methods

The main purpose of this study is to establish how some selected factors affect the estimation of outstanding claim provision of the non-life insurance firms in Ghana using a panel data from 2007-2012. This chapter therefore presents the methodology used in conducting the study. It focuses on the model specification, justification of the variables, data sources and estimation and testing procedure.

RESEARCH HYPOTHESES

This study seeks to test the following hypothesis:

H1: There is a likely significant negative relationship between paid claims and reported outstanding claim provision.

H2: There is a likely significant positive relationship between underwriting premiums and reported outstanding claim provision.

H3: There is likely significant negative relationship between reinsurance issued premiums and reported outstanding claim provision.

H4: There is a likely significant positive relationship between size of firm and reported outstanding claim provision.

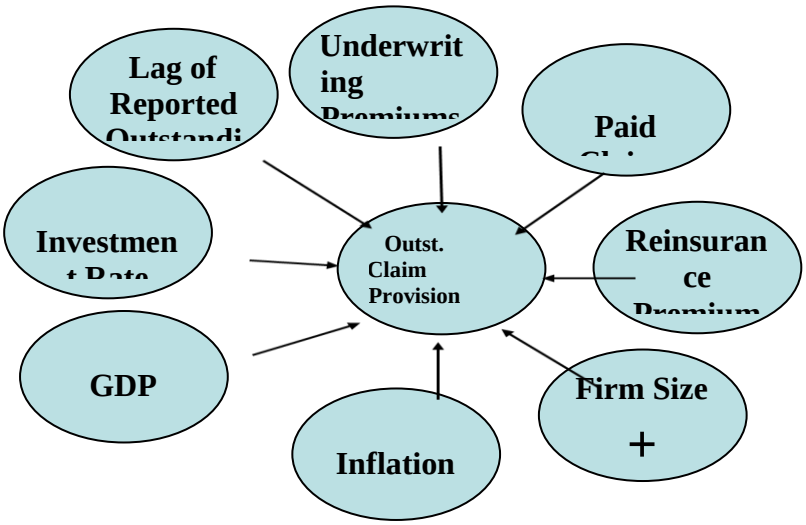
H5: There is a likely significant positive relationship between lag of reported outstanding claim provision and reported outstanding claim provision.

H6: There is a likely significant negative relationship between inflation rate and reported outstanding claim provision.

H7: There is a likely significant negative relationship between investment rate and reported outstanding claim provision.

H8: There is a likely significant positive relationship between real GDP growth rate and reported outstanding claim provision.

Figure 1: Analytical Framework



Source: Authors conceptual framework

3.1 Statistical Analysis and Model Specification

The theoretical and empirical literature has identified a vector of variables that influence general insurance outstanding claim provision including underwriting premiums, paid claims, reinsurance issued premiums, inflation rate, investment rate and company size. This study thus specifies outstanding claim provision estimation model which is inspired by [17] but included other variables that are considered important to the Ghanaian insurance industry as far as the issue of outstanding claim provision is concern. The study therefore estimated a regression model below:

$$OCP_{it} + \beta_1 PCL_{it} + \beta_2 UPR_{it} + \beta_3 RIP_{it} + \beta_4 SIZE_{it} + \beta_5 GDP_t + \beta_6 INF_{t-1} + \beta_7 INV_t + \beta_8 OCP_{it-!} + \varepsilon_{it}$$

Where OCP_{it} represents outstanding claim provision which is the dependent variable measured as the sum of provision for incurred but not reported claim plus provision for reported claims but not yet paid for firm i at time t. UPR_{it} is the underwriting premiums determined as the total premium written at the end of the year for firm i at time t. PCL_{it} is paid claims which represent the total claims incurred in a year for firm i at time t, RIP_{it} is the reinsurance issued premiums which is the total paid to reinsurance companies for firm i at time t, INF_{t-1} is the inflation rate measured by the consumer price index at time t-1, OCP_{it-1} is the effect of the lag of outstanding claim provision for firm i at time t-1. $INF_{t-1}$is the investment rate measured as the rate for 365 day T-bill rate at time t. $SIZE_{it}$ represents size of the firm measured as the natural log of total assets for firm i at time t, GDP_t is the real GDP Growth rate at time t. $\beta_1, \beta_2, \ldots\ldots\ldots\ldots\ldots\ldots\beta_8$ are the respective predictor variables to be determined for the study. Ɛ is a three way error structure defined below:$\varepsilon_{it} = \mu_{it} + \Lambda_{it} + \gamma_t$
whereΛ_{it} is insurance company unobserved effects; γ_t is time specific unobserved effect and μ_{it} is the idiosyncratic error term

IV. Results And Discussion

Table 1 Descriptive Statistics of the Variables

Variable	Mean	Std. Dev.	Min	Max
OCP	1979693	4158302	2477	3.40e+07
UPR	1.43e+07	1.81e+07	16535	9.90e+07
PCL	3205000	4388449	2731	2.60e+07
RIP	5143417	6522295	6134	3.08e+07
SIZE	16.21	1.10	13.95	19.36
INF	11.80336	3.825745	8.58	18.1
INV	16.91315	4.842048	11.3	22.9
GDP	7.632407	3.208221	4.1	13.6

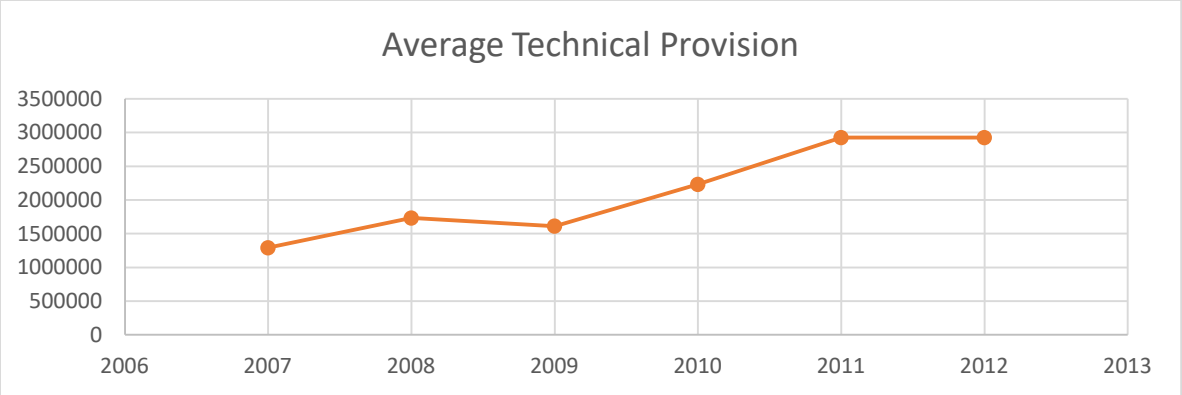
The descriptive statistics in Table 1 shows that over the period under study, the reported outstanding claim provision (OCP) averaged GH¢1,979,693 with paid claims (PCL) also averaging GH¢3,205,000. The average underwriting premiums and the reinsurance premiums (RIP) were GH¢14,300,000 and GH¢5,143,417 respectively. The average non-life insurer in Ghana between the time span of this study had a size of 16.21 measured as the natural log of the total asset. The minimum and maximum figures for size in Table 1 show that there is a vast variation between the non-life insurers in Ghana. Also, the variations within and between the non-life insurance companies was quite high judging from the standard deviations as well as from the minimum and maximum values shown above. The dispersion of the size justifies the fact that larger institutions have more profitable investment opportunities, higher efficiency, more diversification and a lower risk level than smaller ones. The average claims paid within the period were lower than the average underwriting premiums indicating that, the average non-life insurer was profitable and this is a boost for the growth of the industry.

The macroeconomic variables incorporated in this study were inflation (INF), real GDP growth and investment rate (INV). Inflation had an average value of 11.8% for the period under study with a low value of 8.58% and a high value of 18.1%. This shows relatively stable changes in prices within the time of this research. Interest rate on the other hand had a mean value of 16.9% with the minimum and maximum in the period being 11.3% and 22.9% respectively. The variability in the inflation series is 3.8% whiles that of interest rate is 4.8%. Table 1 also presents the characteristics of the real GDP growth; it shows that the average GDP growth between 2007 and 2012 was 7.35% recording maximum value of 13.6% and a minimum of 4.1%.

4.2 Trend Analysis of Industry Outstanding Claim Provision

The figure 2 shows a plot of the yearly observations for outstanding claim provision in the non-life insurance industry in Ghana from the year 2007 to the year 2012. It can be observed that insurance industry witnessed a positive growth in outstanding claim provision in 2007/2008, however, it experienced a decline during the period of 2008 to 2009, the worst years of the financial crisis. The industry's outstanding claim provision return to growth in 2010 can largely be attributed to the increased demand for insurance due to initial economic recovery across the globe. Looking to 2011 and 2012, the insurance industry witnessed insignificant growth in volumes of outstanding claim provision.

Figure 2 Trend of Industry Outstanding Claim Provision.



Source: Authors construct

Figure 2- *Outstanding claim provision in the non-life insurance industry in Ghana. The vertical axis measures the variable outstanding claim provision in the Ghanaian industry. The horizontal axis corresponds the time periods.*

Table 2 Fixed Effects Regression Results

Dependent Variables	Coef.	Std. Err.	T-stat	P>|t|
UPR	0.084	0.187	0.45	0.653
PCL	-0.313	0.154	-2.03	0.047**
RIP	-3.61e-15	1.63e-15	-2.22	0.030**
SIZE	0.001	0.000	1.89	0.063*
INF	0.075	0.507	0.15	0.882
INV	-0.046	0.035	-1.29	0.200
Lag of OCP	-0.001	0.001	-2.48	0.016**
GDP	0.000	0.000	2.22	0.030**
Cons	15.287	2.212	6.91	0.000***

Source: Authors construct

Note: The asterisk *, **, *** indicate significance at 10%, 5% and 1% levels respectively.

Number of observations = 93, R- Squared = 0.5226, F- statistic = F(8, 84) =11.49, (Prob> F = 0.0000).

The R^2 measures the extent to which the explanatory variables explain the variations in the dependent variables. From Table 2 above, the results indicate that the explanatory variables explained 52.26% of the variations in the estimation of outstanding claim provision in the non-life insurance sector of Ghana within the period under study.

The rest 47.74% of the variation in outstanding claim provision was not explained by the independent variables of the study. However, the *F*-test which shows the global usefulness of the model indicates appreciable goodness of fit. P-value of 0.000 indicates a strong statistical significance at 1 % level of significance, which shows the explanatory power of the model. The constant term indicates the outstanding claim provision levels if all the explanatory variables are put to zero. It is significant at 1% significant level and shows that other factors which equally impact on outstanding claim provision have not been captured in the model. These factors may be institutional and/or legal environments in which the insurance firms operate.

The findings of this study show that there is positive relationship between underwriting premium and reported outstanding claim provision but statistically insignificant. The study hypothesized a positive and significant relationship between underwriting premium received and estimated outstanding claim provision. However, since the p-value as shown in Table 2 is insignificant at 5% significant level the study rejects the null hypothesis that there is positive and significant relationship between underwriting premium and reported outstanding claim provision. This means that even though underwritten premiums positively impact the estimation of outstanding claim provision in Ghana, it is not considered as a powerful explanatory variable to determine the level of outstanding claim provision reported.

This finding contradicts that of [16] and [17]who found underwriting premiums to be positively and significantly related with reported outstanding claim provision. They both attributed the significant positive relationship to the fact that premiums are normally associated with the increase in the units of risk, number of claims and hence outstanding claim provision as well.

V. Conclusion

From the empirical results, a number of revelations came out. Most of the outcomes from the empirical results confirmed the study expectations. The panel regression result revealed that major determinants of Ghanaian non-life insurers outstanding claim provision include claims paid, reinsurance issued premiums, lag of outstanding claim provision, size and the real GDP growth rate.

The result also showed that paid claims has significant negative effect on outstanding claim provision in Ghana which is an indication that expectation for outstanding claim obligation is less when more claims have already been paid in the year and hence less outstanding claim provision. There was also a negative relationship between reinsurance issued premium and outstanding claim provision which means Ghanaian non-life insurers are reserving less based on reinsurance issued premium. Past information on outstanding claim provision also influence the estimation of present outstanding claim provision in Ghana.

Increase in size enables non-life insurers in Ghana to take on more risky ventures which ultimately increase the level of outstanding claim provision reported. Real GDP growth rate is very important determinant of non-life insurer's outstanding claim provision in Ghana. It is important for us to acknowledge that as growth rate increases in Ghana demand for insurance also increases and is in line with the increase in outstanding claim provision.

Further Research Direction

The results of the current study shows that 47% of the variation in reported outstanding claim provision of non-life insurance firms in Ghana could not be accounted for by the explanatory variables, it means there are other important variables that were not included in this study. Therefore, further study can be conducted to expand the number of variables to include factors such as product portfolio, managerial and regulatory factors since they are all likely to have an influence on reported outstanding claim provision.

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