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ANALYSIS OF UNDERWRITING ACTIVITY AND ITS IMPACT ON THE PROFITABILITY RATIOS OF THE INSURANCE COMPANIES LISTED IN THE IRAQ STOCK EXCHANGE

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Abstract: It is commonly accepted that the success and expansion of insurance companies' underwriting operations, which is indicated by the premiums received from insurance policies, is reflected in their profitability rates. During the period of 2010 to 2021, Iraqi insurance companies in the private sector that are listed on the Iraq Stock Exchange experienced a fluctuation in the increase and noticeable decrease of gross written premiums, which had a negative impact on their profitability ratios. The aim of this investigation is to analyze the underwriting activities carried out by all insurance companies that are publicly listed on the Iraq Stock Exchange spanning from 2010 to 2021, and assess the impact of these activities on the companies' profitability rates. To evaluate the profitability of these firms, three indicators are used, namely the rate of return on assets, return on equity, and profit margin ratio. The study employs Data Panel models using Eviews 12 to identify the research samples during the study period. Additionally, the pooled regression model is used to compare the findings and test the hypotheses of the study. In a structured manner, data is collected from the annual reports released by the Iraq Stock Exchange. The statistical examination of the findings reveals that the gross written premium has a significant and positive influence on all of the profitability ratios that were evaluated in this study, namely the rate of return on assets, return on equity, and profit margin ratio.

Keywords: Underwriting activities; Gross written premium GWP; Profitability ratios; Insurance companies; Panel data.

JEL Codes: G22, G52, C23.

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1. Introduction

One of the most important technical activities used by insurance firms in the insurance process is underwriting, which is regarded as the key to the success of insurance businesses in offering their services through the sale of insurance policies. As a result, if gross written premiums are sufficient to pay claims, it will have a favorable impact on the profitability of insurance firms, which is a crucial aspect in ensuring their viability and a crucial sign of their capacity to increase revenues. The underwriting activities of insurance companies are examined in this article using the independent variable of gross written premiums as a proxy, and their effects on the profitability ratios are assessed using its three dimensions, ROA, ROE, and PM, for the years 2010 to 2021.

2. Literature review

2.1 Independent Variable: Gross written premium

Rashid and Kemal (2018) evaluated the internal (Micro) and external (Macro) factors of the profitability of insurance companies by taking into account three measures of insurers' profitability: overall profit (ROA), underwriting profit (UP), and investment income (INI). These factors include gross written premium, claims, management expansion, leverage, and size. Panel data regression was used to analyze data from life insurance companies in Pakistan for the years 2006 to 2016. The study found that factors like gross written premium, management expense, size, and interest rate had a big impact on how profitable insurance companies are.

Deyganto and Alemu (2019) looked into how various variables, such as underwriting risk, reinsurance dependence, solvency ratio, premium growth, company size, GDP growth rate, inflation, and interest rate, affected the financial performance of insurance companies in the Hawassa city Administration in Ethiopia. There were 17 general insurance companies represented in the study's sample. OLS regression model was used to evaluate the data. According to the study, each of the following variables—Underwriting Risk, Solvency Ratio, Premium Growth, GDP Growth Rate, and Inflation—has a substantial impact on the financial performance of insurance companies doing business with the Hawassa municipal administration. The financial performance of the enterprises under study is not significantly impacted by the other variables (reinsurance reliance, company size, interest rate).

The effect of corporate governance and the rise in insurance premiums on the financial performance of insurance businesses in Indonesia was examined by Markonoh et al. (2019). This study found that the financial success of insurance companies doing business in Indonesia is positively impacted by governance and premium growth.

During the years 2013 to 2017, Kerim et al. (2019) looked into the effect of capital structure on the profitability of 15 insurance businesses listed in Nigeria. Short-term and long-term debt were used in the study to proxy the capital structure (independent variable), while return on equity (ROE) was used to proxy profitability as the dependent variable. While the control variable was premium growth, which was calculated as a change (increase/decrease) in gross writing premium (GWP). The study employed a correlation search methodology, and the OLS Multiplier regression approach was used to examine the data that had been obtained. The findings indicated that while long-term debt and (premium growth) have a beneficial impact on profitability as measured by (ROE) of insurance companies listed in Nigeria, short-term debt has a considerable negative impact on profitability.

After the financial crisis in (2007-2008), which caused the insurance sector to contract in (2008-2010), Jumaa (2020) investigated the effects of inflation and gross written premiums (GWP) on the profitability of insurance businesses in the United Arab Emirates (UAE). According to the study's findings, the profitability of the insurance industry in the United Arab Emirates is positively impacted by both the rate of inflation and the gross written premiums for the years 2010 through 2019.

Amel and Douadi (2021) researched the underwriting function and its significance for insurance firms, as well as the risks it poses, its connection to financial solvency, and the factors that insurance companies must consider when drafting their underwriting policy. The study used a descriptive-analytical approach to assess the Algerian Insurance Company's (SAA) underwriting policy. The study came to the conclusion that underwriting, which serves as the foundation and entry point for insurance activity, is the most crucial task performed by insurance companies, using its financial data for the years 2016–2019. As a result of tight control over its underwriting operations, the SAA came to the top.

2.2 Dependent Variable: Profitability Ratios

Using the financial rate of return index, Baltes and Minculete (2016) assessed the financial performance of pharmaceutical industry companies between 2009 and 2014. To examine the data, multiplier linear regression was utilized. The researchers came to the conclusion that more businesses have turned to loans and obligations to finance their financial activities during the investigation period as a result of the liquidity issue such organizations are experiencing due to the lengthy debt repayment process. Additionally, the net profit margin has a negative impact on the financial return of pharmaceutical companies whereas their economic profitability, the equity multiplier, and inflation have favorable influences.

Elsayed (2020) investigated how different variables affected the financial performance of the Egyptian insurance business. In order to assess the relationship

between the independent variables (financial leverage, physical assets, cash liquidity, company size, underwriting risk, and solvency margin) and the dependent variables return on assets (ROA), and return on equity (ROE), the study collected data from 22 life insurance companies in Egypt. According to the findings, all independent variables—aside from underwriting risks—had a favorable effect on the financial health of Egyptian insurance companies. Contrarily, underwriting risk significantly affects return on equity but has little effect on return on assets.

Pordea et al. (2020) used a linear regression model on cross-sectional financial data for one reporting year to examine the effects of operating cash flow and the current liquidity ratio on (profitability) in the context of construction enterprises in western Romania. The model's external variables did not show any statistical significance, according to the results. However, the report included recommendations for further addressing the issue of cash flows and the capacity of construction businesses to meet their immediate responsibilities while upholding performance pledges.

By analyzing the impact of a number of independent variables (company size, financial leverage, inflation, market share, liquidity, premium growth, capital adequacy, and age of the company) on the profitability index, Kelemu (2021) clarified the factors that affect profitability in insurance companies operating in Ethiopia. On chosen panel data, the study applied the linear regression method, correlation analysis, and the statistical descriptive approach. For the years 2011 to 2020, (9) Ethiopian insurance companies were included in the research sample. The study found that while leverage and market share have little impact on profitability, firm size, inflation, liquidity, premium growth, capital adequacy, and age all had a substantial impact.

The effect of (COVID-19) short-term on insurance activities in North Macedonia was examined by Stojkoski et al. (2021). A seasonal autoregressive model was employed by the researchers. According to the report, insurance-related activities fell short of expectations during the first half of the year 2020 by more than 10%. Additionally, losses in the insurance sector were roughly 8.2 million euros. The epidemic has also resulted in a number of structural changes in the insurance industry as well as a noticeable fall in the percentage of auto insurance.

The variables influencing the performance of the financial insurance businesses listed on the Abu Dhabi Stock Exchange were identified by Al-Mutairi et al. (2021). Liquidity, general and administrative costs, hazards, size, and age are the independent factors examined. Return on assets (ROA) was the dependent variable used to assess financial success. Regression analysis was used in the study to examine data from 17 organizations over the course of seven years (2013–2019). According to the study, although other independent variables had a negative impact on insurance businesses' profitability, age had a beneficial impact. As a result, the

study advised investors to consider the company's age while making investment selections.

The primary factors influencing profitability trends in the Serbian insurance sector for the years 2008–2019 (inclusive) were examined by Vojinovi et al. (2022). To clarify relationships between determinants, institutional variables, macroeconomics, return on assets (ROA), and return on total premium (ROTP), they combined basic panel regression models with a mixed-effects model. The study came to the conclusion that factors including business size, GDP, political stability, population growth rates, and degree of specialization all result in increased profitability (in some empirical models). It has been found that profitability and inflation are inversely associated (in certain ratings).

Despite the fact that many studies have examined the profitability of insurance companies, they have mainly focused on return rates and return on equity as return ratios and neglected the importance of margin rates. To the authors' knowledge, margin rates are essential for measuring the company's ability to generate profits in relation to the revenues earned. Furthermore, the prior studies focused on the international, Arab and Gulf insurance markets. While the current study focused on the Iraqi insurance sector, this study seeks to examine the underwriting activities of insurance premiums of companies listed on the Iraq Stock Exchange from 2010 to 2021. Specifically, this study intends to assess the impact of the gross written premium on profitability ratios, including return on assets, return on equity, and profit margin ratio. In other words, this study would investigate both return ratios and margin ratios as important indicators of profitability. Also, this study focuses on the period between 2010 and 2021, which encompasses significant events in Iraq, such as the emergence of ISIS, the implementation of insurance business regulations, a decline in oil prices, the liberation of Iraq from terrorism, and the COVID-19 pandemic. In contrast to previous studies that relied on SPSS for their analysis, EVIEWS 12, a powerful statistical software that includes sectional time series models and panel data analysis capabilities, is used in this study to conduct the standard analysis.

The following illustrate the main objectives of the current study;

1. Analyzing and diagnosing the underwriting activities of Iraq Stock Exchange-listed insurance companies.
2. Researching and assessing the profitability ratios for insurance companies listed on the Iraq Stock Exchange. These include the rate of return on assets, the rate of return on property rights, and the profit margin ratio.
3. Assessing and calculating the impact of gross written premium on the aforementioned profitability ratios in insurance companies listed on the Iraq Stock Exchange for the period between 2010 and 2021.

3. Design of research methodology

This section presents the variables used in the analysis, the questions and the hypothesis of the study.

Based on the main objectives of the current study, the independent and dependent variables are:

1. The independent variable: Gross written premium (GWP)
2. The dependent variable: profitability ratios represented by return on assets (ROA), return on equity(ROE), and profit margin (PM).

Figure 1 shows the study model that introduces the effect of the independent study variables on the dependent.

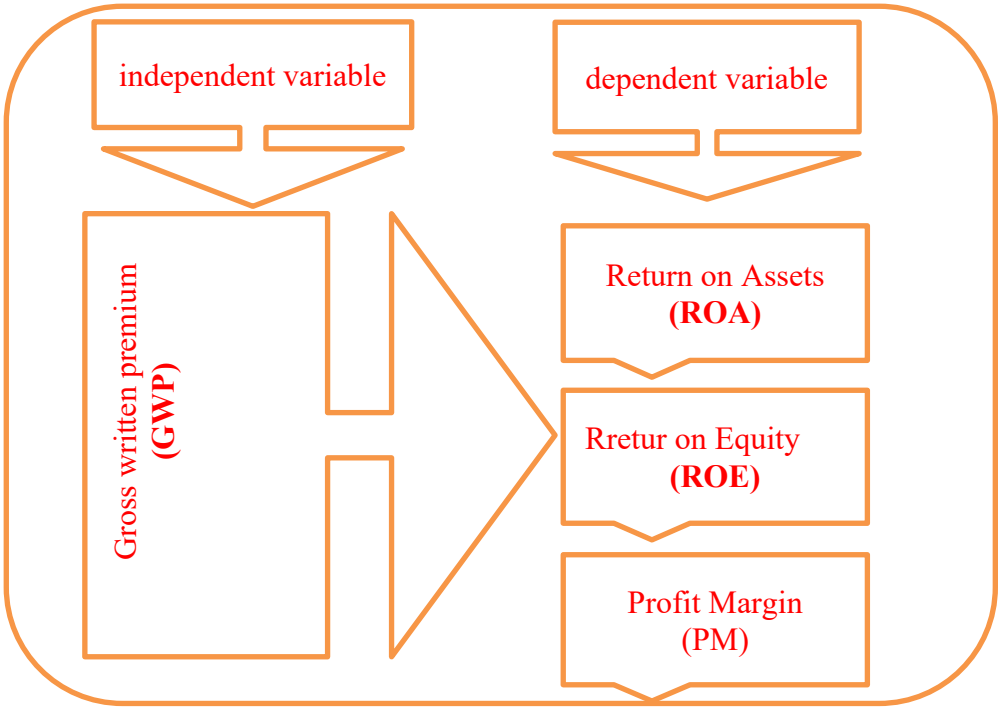

Figure 1. The study model
Source: Author projection

4. Research problem

During the study period of 2010–2021, gross written premiums (GWP) for insurance companies listed on the Iraq Stock Exchange moved upwards and downwards, which had an impact both favorably and negatively on the profitability ratios of insurance

companies (ROA, ROE, and PM). In order to answer the following issues, the current study aims to determine the primary causes of the gross written premiums' instability:

1. What is the effect of gross written premium to insurance companies listed in the Iraq Stock Exchange on the return on assets?
2. What is the effect of the gross written premium to the insurance companies listed in the Iraq Stock Exchange on the return on equity?
3. What is the effect of the gross written premium to the insurance companies listed in the Iraq Stock Exchange on the profit margin?

5. Research hypotheses

The validity of the following hypotheses will be therefore verified by this research:

1. There is no statistically significant relationship between gross written premium and the return on assets.
2. There is no statistically significant relationship between gross written premium and the return on equity.
3. There is no statistically significant relationship between gross written premium and profit margin

6. Data sources and collected information

The insurance businesses listed on the Iraq Stock Exchange were included in the study community, which included 5 private-sector insurance companies. These companies are listed in Table 1. Thus, the data was obtained from the financial reports of insurance companies issued on the Iraq Stock Exchange for the period between 2010 and 2021.

Table 1. Names of the insurance companies listed in the Iraq Stock Exchange

Dar AL-Salam Insurance Company
Gulf Insurance Company
Hamraa Insurance Company
AL- Ahlia Insurance Company
AL- Ameen Insurance Company

Source: Author projection based on the Annual reports of (ISX) available on the website http://www.isx-iq.net/isxportal/portal/sectorProfileContainer.html?sectorId=3

7. Gross written premiums

It should be mentioned that one aspect affecting performance, and consequently, its profitability is the gross written premiums by the insurance firms. In this respect, a rise in underwriting operations is indicated by an increase in insurance premiums from one year to the next. As a result, both the demand for purchasing insurance

policies and earnings rise (Amel and Douadi, 2021). The total written premiums of insurance companies listed on the Iraq Stock Exchange are shown in Table 2 for the years 2010 through 2021.

Table 2 The evolution of Gross written premium for the insurance companies from 2010 to 2021 (amounts in IQD)

Year	Premiums of Dar AL-Salam	Premiums of Gulf	Premiums of Hamraa	Premiums of AL-Ahlia	Premiums of AL-Ameen	Gross written premium	percentage change (%)
2010	526,234,884	290,821,921	1,557,032,687	337,061,828	82,100,130	2,793,251,450	*
2011	605,122,163	221,727,507	10,363,848,106	674,543,839	321,187,202	12,186,428,817	336
2012	886,578,164	383,306,727	11,082,247,737	1,021,290,684	761,335,100	14,134,758,412	16
2013	1,085,495,750	327,957,913	12,177,327,478	702,598,599	1,301,269,934	15,594,649,674	10
2014	1,432,740,772	310,211,650	4,488,492,692	353,393,472	833,228,677	7,418,067,263	-52
2015	724,087,073	147,042,529	1,645,079,940	244,946,245	664,917,740	3,426,073,527	-54%
2016	265,147,537	174,306,455	2,463,670,773	166,767,920	599,526,746	3,669,419,431	7
2017	107,999,690	1,023,561,359	7,138,574,175	162,529,410	343,717,735	8,776,382,369	139
2018	1,035,431,292	585,148,990	6,803,877,729	93,035,383	354,271,365	8,871,764,759	1
2019	3,611,842,605	105,987,450	5,419,056,359	11,968,700	419,841,018	9,568,696,132	8
2020	3,257,144,445	81,872,099	19,003,171,617	46,559,201	532,591,901	22,921,339,263	140
2021	3,042,217,800	701,735,193	12,308,857,218	641,376,139	678,184,797	17,372,371,147	-24

Source: data processed by the author based on the Annual reports of (ISX) available on the website http://www.isx-iq.net/isxportal/portal/sectorProfileContainer.html?sectorId=3

The following conclusions can be made from Table 2:

1. The percentage change in gross written premium to insurance companies from 2011 to 2013 reveals a significant increase in underwriting activities. In 2013, the maximum value of gross written premiums was 15594649674 billion IQD, indicating a 10% growth from 2012. The expansion of the insurance business in Iraq can be attributed to the establishment of a bureau for regulating the insurance business, a unit of the Ministry of Finance, which started operating on June 1,

2005. The bureau is a critical aspect of Law No. 10 of 2005, which regulates the insurance sector to ensure an open, transparent, and financially secure market. Private enterprises are also permitted to acquire insurance licenses with the President of Diwan's approval, enabling the Insurance Bureau to guide these companies and resulting in a growing number of private insurance enterprises in Iraq. Additionally, Article 84 of the Insurance Regulation Act led to the formation of the Iraqi Insurance and Reinsurance Companies Association, which holds regular meetings to discuss and enhance the Iraqi insurance sector. As a result of these developments, new insurance policies have been introduced into the Iraqi financial market. (https://www.moj.gov.iq/iraqmag).

2. The gross written premiums decreased from 15594649674 billion IQD in 2013 to 7418067263 billion IQD in 2014 with a negative percentage change of -52%, and this trend continued until 2015 with a gross written premium of 3426073527 billion IQD and a negative percentage change of -54%. This occurred after the entry of ISIS in June 2014. Because of the precarious security situation, insurance companies are unable to build branches in governorates controlled by ISIS and are unable to collect premiums from insured parties.
3. As a result of the start of the liberation operations in 2016 for the Governorates that were under ISIS control, the gross written insurance began to modestly increase for the period from 2016 to 2020. Due to the liberation operations not including every occupied Governorate, the companies only received 3426073527 billion IQD in 2015, a small difference from the 3669419431 billion IQD they received in 2014 and a positive percentage change of 7%.
4. With a favorable percentage change of 139%, the rise of gross written premiums in 2017 reached 8776382369 billion IQD. In comparison to 2016, the increase reached 5 billion IQD. The Baghdad government's declaration is what caused this rapid increase. The liberation of all the areas that ISIS had occupied in the summer of 2014 on December 10, 2017, had a favorable impact on the insurance industry, and insurance branches soon began operating in every governorate in Iraq. Additionally, the firms regain their rights from the insured, and as a result, the insurance companies have observed a condition of administrative and economic stability following liberation operations.
5. Up to 2020, the growth in gross written premiums persisted. The companies obtained a positive percentage change rate of 140% and the maximum sum insured of 22921339263 billion IQD. The security situation stabilizations allowed insurance companies to strengthen their market presence by issuing new types of insurance policies that are suitable for the circumstances that Iraq went through, such as life insurance, and this improvement in underwriting activities as a result.

6. According to research by Stojkoski and colleagues published in 2021, the gross written premiums fell to 17372371147 billion IQD in 2021, a loss of -24%. This decline in underwriting activity was caused by the announcement of the COVID-19 pandemic in Iraq.

Table 3 presents the gross written premiums and market share of the insurance companies listed in the Iraq Stock Exchange from 2010 to 2021.

Table 3 Gross written premiums GWP and market share of the studied insurance companies 2010-2021

Total	AL- Ameen	AL-Ahlia	Hamraa	Gulf	Dar AL-Salam	Description	year
2,793,251,450	82,100,130	337,061,828	1,557,032,687	290,821,921	526,234,884	GWP	**2010**
100%	3%	12%	56%	10%	19%	Market share	
12,186,428,817	321,187,202	674,543,839	10,363,848,106	221,727,507	605,122,163	GWP	**2011**
100%	2.6%	5.5%	85.0%	1.8%	5.0%	Market share	
14,134,758,412	761,335,100	1,021,290,684	11,082,247,737	383,306,727	886,578,164	GWP	**2012**
100%	5.4%	7.2%	78.4%	2.7%	6.3%	market share	
15,594,649,674	1,301,269,934	702,598,599	12,177,327,478	327,957,913	1,085,495,750	GWP	**2013**
100%	8.3%	4.5%	78.1%	2.1%	7.0%	Market share	
7,418,067,263	833,228,677	353,393,472	4,488,492,692	310,211,650	1,432,740,772	GWP	**2014**
100%	11.2%	4.8%	60.5%	4.2%	19.3%	Market share	
3,426,073,527	664,917,740	244,946,245	1,645,079,940	147,042,529	724,087,073	GWP	**2015**
100%	19.4%	7.1%	48.0%	4.3%	21.1%	Market share	
3,669,419,431	599,526,746	166,767,920	2,463,670,773	174,306,455	265,147,537	GWP	**2016**
100%	16.3%	4.5%	67.1%	4.8%	7.2%	Market share	
8,776,382,369	343,717,735	162,529,410	7,138,574,175	1,023,561,359	107,999,690	GWP	**2017**
100%	3.9%	1.9%	81.3%	11.7%	1.2%	Market share	
8,871,764,759	354,271,365	93,035,383	6,803,877,729	585,148,990	1,035,431,292	GWP	**2018**
100%	4.0%	1.0%	76.7%	6.6%	11.7%	Market share	
9,568,696,132	419,841,018	11,968,700	5,419,056,359	105,987,450	3,611,842,605	GWP	**2019**

100%	4.4%	0.1%	56.6%	1.1%	37.7%	Market share	
22,921,339,263	532,591,901	46,559,201	19,003,171,617	81,872,099	3,257,144,445	GWP	2020
100%	2.3%	0.2%	82.9%	0.4%	14.2%	Market share	
17,372,371,147	678,184,797	641,376,139	12,308,857,218	701,735,193	3,042,217,800	GWP	2021
100%	3.9%	3.7%	70.9%	4.0%	17.5%	Market share	

Source: data processed by the author based on the Annual reports of (ISX)available on the website http://www.isx-iq.net/isxportal/portal/sectorProfileContainer.html?sectorId=3

The following conclusions can be made from Table 3:

1. When we look at the gross written premiums for each firm separately in Table 3, we see that the majority of the examined insurance companies did not surpass one billion Iraqi dinars in premiums except in one year during the study period 2010 to 2021, as follows:
   A) During the research period, the Gulf Company attained one billion Iraqi dinars in only one year, 2017, as gross written premiums 1023561359 billion IQD
   B) Al-Ahlia Insurance Company also achieved the billion-dollar mark in one year, in 2012, with gross written premiums 1021290648 billion IQD.
   C) Al-Amin Insurance Company likewise hit the billion-dinars mark in only one year during the research period, 2013, with gross written premiums 1301269934 billion IQD.

This can be explained by the fact that these companies did not make any significant changes to their policies, performance, or products, putting them in a weak competitive and negotiating position throughout the study period when compared to other companies like Al-Hamra and Dar Al-Salam Insurance.

2. In contrast to the information presented in the previous paragraphs, it is important to mention that Al-Hamra Insurance Company had notably high insurance premiums in comparison to the other researched insurance companies throughout the study period from 2010 to 2021, exceeding one billion Iraqi dinars and its market share for 48 to 85% of the total business volume. This can be attributed to the company's good reputation in the Iraqi financial sector, as well as their underwriting policy focused on maintaining prices while taking into consideration market competition. Additionally, the company aimed to fully cooperate with local companies and made significant efforts to diversify their insurance premiums despite the challenging circumstances faced by Iraq.

By dividing (the market value of the shares of the insurance sector by the total market value of shares for all sectors in the market), the market share of the insurance sector

was estimated based on the market as a whole. But it's important to keep in mind that there are just eight industries represented on the Iraqi Stock Exchange: banking, insurance, services, investments, industry, communications, agriculture, lodging, and tourism. The lowest market share is shown in Table 4 for the insurance and investment sector. This is because, in contrast to other financial institutions like banks, which have attained the highest percentage of market share, there are only 5 insurance companies listed on the Iraq Stock Exchange. Furthermore, the number of banks listed in the market is 47 banks, and this information is available on the Iraq securities commission (https://www.isc.gov.iq/index.php?do=list&type=report&xtype=year).

Table 4 presents the market value for shares of the insurance sector in the Iraq Stock Exchange (2010-2021)

Table 4 The market value for shares of the insurance sector

Total	Telecommunication sector	agricultural sector	Industry sector	tourism & Hotel sector	services sector	insurance sector	investment sector	Bank sector	Description	year
3462275	0	36055	393190	455175	141815	16314	10970	2408756	market share	2010
100	0.0	1.0	11.4	13.1	4.1	0.5	0.3	69.6	Changing Ratio(%)	
4930232	0	54895	450793	413714	168362	17431	13449	3811589	market share	2011
100	0.0	1.1	9.1	8.4	3.4	0.4	0.3	77.3	Changing Ratio	
5327351	0	61807	392692	390858	163912	14717	9807	4293558	market share	2012
100	0.0	1.2	7.4	7.3	3.1	0.3	0.2	80.6	Changing Ratio (%)	
11451961	4995222	80014	558755	427036	144711	13773	4150	5228300	market share	2013
100	43.6	0.7	4.9	3.7	1.3	0.1	0.0	45.7	Changing Ratio(%)	
9520626	3510156	76755	465126	502319	148496	13554	3185	4801035	market share	2014
100	36.9	0.8	4.9	5.3	1.6	0.1	0.0	50.4	Changing Ratio(%)	
12364785	7910225	73853	536193	301839	129162	8140	2387	3402995	market share	2015
100	64.0	0.6	4.3	2.4	1.0	0.1	0.0	27.5	Changing Ratio (%)	

12130402	7933593	72092	462720	364234	85693	7171	2240	3202660	market share	2016
100	65.4	0.6	3.8	3.0	0.7	0.1	0.0	26.4	Changing Ratio (%)	
12307993	7574295	89921	580325	306622	76608	7066	2240	3670916	market share	2017
100	61.5	0.7	4.7	2.5	0.6	0.1	0.0	29.8	Changing Ratio (%)	
6292869	2387000	79541	737574	308338	74260	2306	0	2703850	market share	2018
100	37.9	1.3	11.7	4.9	1.2	0.0	0.0	43.0	Changing Ratio (%)	
6580576	2681500	93107	712926	377552	98768	3422	0	2613300	market share	2019
100	40.7	1.4	10.8	5.7	1.5	0.1	0.0	39.7	Changing Ratio (%)	
6287155	2266100	132801	869461	358912	126889	3617	0	2529375	market share	2020
100	36.0	2.1	13.8	5.7	2.0	0.1	0.0	40.2	Changing Ratio (%)	
15869906	6530400	253864	1089483	374375	142167	21828	3720	7457069	market share	2021
100	41.1	1.6	6.9	2.4	0.9	0.1	0.0	47.0	Changing Ratio (%)	

Source: data processed by the author based on the annual reports of ISX during 2010-2021 available on the website - https://www.isc.gov.iq/index.php?do=list&type=report&xtype=year

8. Profitability Ratios

Profitability is a prime purpose that insurance companies strive for in order to strengthen their competitiveness, attract investors, enhance their level of solvency, and, as a result, boost insured confidence in the company, and are used as a measure of the profits that the companies earn over a certain time period depending on the level of its sales, assets, capital, and earnings per share (Burca and Batrinca, 2014). Among the most prominent ratios that measure profitability are:

8.1 Return on Assets (ROA)

It displays the company's management's ability to produce a profit from its assets, and the higher this ratio, the greater the management's efficiency in utilizing the asset, and it is computed using the following ratio (Orsina and Stone, 2005):

Return on assets = (net profit before tax / total assets) x 100%

This ratio can be used in small financial institutions that have few owner's equity, so the objective of this ratio is to measure profitability (Badreldin, 2009, p. 2). This ratio expresses how the company's assets are converted into profits (Moin, 2008).

Table 5 shows the average return on assets for the studied companies in Iraq Stock Exchange from 2010 to 2021.

Table 5. Return on assets for the insurance companies for the period (2010-2021)

Return on assets					Year
AL- Ameen	**AL- Ahlia**	**Hamraa**	**Gulf**	**Dar AL-Salam**	
2.3%	6.5%	11.0%	2.3%	7.8%	2010
6.6%	2.3%	32.0%	2.4%	7.7%	2011
10.9%	7.3%	14.8%	0.7%	7.1%	2012
20.5%	10.6%	13.1%	1.1%	6.7%	2013
11.7%	-6.1%	4.9%	7.0%	7.4%	2014
8.7%	-5.0%	9.2%	3.2%	5.4%	2015
4.8%	-1.3%	5.0%	3.2%	2.9%	2016
-1.9%	-3.5%	5.6%	8.3%	1.8%	2017
2.6%	-3.4%	6.2%	6.5%	0.6%	2018
0.6%	8.6%	5.1%	0.4%	2.0%	2019
3.2%	-3.2%	6.5%	0.6%	1.9%	2020
7.4%	5.0%	5.6%	0.4%	1.7%	2021
6.4%	1.5%	9.9%	3.0%	4.4%	Arithmetic mean

Source: The author's calculations performed in (Eviews 12)

Table 5 introduces the following matters:
1. Al-Hamra Insurance Company took the top place in this ranking and has sustained its lead. The return on assets fluctuated from 32.0% to 4.9%, with the greatest value in 2011 being 32.0% and the lowest value in 2014 being 4.9%.
2. Al-Ameen Insurance Company came in second, with a return on assets ranging from 20.5% in 2015 to 1.9% in 2017, while Dar Al-Salam and Al-Khaleej Insurance Companies came in third and fourth, respectively.
3. We observe the huge and severe reduction in the return on assets for Al-Ahlia Insurance, which placed last among insurance companies over the study period from 2010 to 2021, reaching a low of 6.1% in 2014.
4. The disparity in profitability ratios, as reflected by the return on assets, between the insurance companies listed on the Iraq Stock Exchange is explained as a difference strongly tied to the market shares of the companies analyzed, as shown in Table 3. Al-Hamra Insurance Company, in particular, captured the greatest market share of overall insurance activity in the Iraqi financial sector.

8.2 Return on Equity(ROE)

This ratio is an indicator of management's capacity to produce a profit from shareholder funds, and it may be computed as follows (Kabajeh et al., 2012).

Return on equity = (net profit before tax equity/ property rights) x 100%
The rate of return on equity is one of the most commonly used ratios in evaluating the financial performance of institutions (Pearl & Rosenbanm, 2009).
Table 6 shows the rate return on equity for the studied companies in Iraq Stock Exchange from 2010 to 2021.

Table 6. Return on equity for the insurance companies for the period (2010-2021)

Return on equity					Year
AL- Ameen	**AL- Ahlia**	**Hamraa**	**Gulf**	**Dar AL-Salam**	
2.8%	7.1%	17.9%	2.6%	8.2%	2010
7.4%	2.7%	43.2%	2.6%	8.1%	2011
11.9%	8.0%	27.9%	0.9%	7.3%	2012
21.9%	11.4%	22.6%	1.4%	8.6%	2013
12.8%	-7.1%	7.1%	9.7%	8.7%	2014
9.7%	-6.3%	13.4%	3.4%	5.7%	2015
5.1%	-1.7%	6.9%	3.3%	2.9%	2016
-2.0%	-4.7%	7.9%	8.8%	1.8%	2017
2.7%	-4.9%	8.3%	8.1%	0.6%	2018
0.7%	12.5%	7.4%	0.5%	2.0%	2019
3.4%	-5.1%	10.0%	0.8%	2.0%	2020
7.8%	5.9%	10.3%	0.5%	1.9%	2021
7.0%	1.5%	15.2%	3.6%	4.8%	Arithmetic mean

Source: The author's calculations performed in (Eviews 12)

The following conclusions can be made from Table 6:
1. Al-Hamra Insurance Company rated first in terms of return on equity, with its maximum value reaching 43.2% in 2011, and its lowest value reaching 6.9% in 2016.
2. Al-Ameen Insurance Company came in second, with a return on equity ranging from 21.9% to 2.0%, while Dar Al-Salam and Al-Khaleej Insurance Companies came in third and fourth, respectively.
3. A considerable decline in the return on equity for Al-Ahlia Insurance Company, which placed last among the insurance companies analyzed over the study period, reaching a low of 7.1% in 2014.

8.3 Profit Margin (PM)

The profit margin percentage depicts the profit-to-sales ratio, which demonstrates the ability of sales activity to collect earnings. The gross profit ratio is computed by dividing the gross profit by the net sales and is used to assess the company's ability to deal with minor setbacks caused by a drop in market prices or an increase in expenses. The net profit ratio is also used, which is calculated by dividing net profit after tax by net sales. The establishment considers the resulting ratio because it is concerned with income and other expenses (Stickney et al., 2007).

In this study, the gross profit percentage was adopted through the following law:

Profit margin = (Gross profit / Net sales) x 100

Table 7 shows the profit margin for the insurance companies in Iraq Stock Exchange from 2010 to 2021.

Table 7. The profit margin for the insurance companies for the period (2010-2021)

Profit margin percentage					Year
AL- Ameen	**AL- Ahlia**	**Hamraa**	**Gulf**	**Dar AL-Salam**	
37.0%	16.8%	17.9%	1.1%	38.4%	2010
39.2%	3.0%	12.6%	-18.9%	40.5%	2011
40.7%	19.1%	9.6%	26.7%	32.9%	2012
56.0%	40.4%	8.4%	32.9%	33.7%	2013
54.1%	-36.5%	7.7%	46.0%	21.9%	2014
50.7%	-32.9%	27.2%	30.9%	37.5%	2015
27.9%	-17.1%	18.0%	25.2%	42.8%	2016
-14.3%	-56.0%	15.7%	40.2%	25.3%	2017
22.0%	-90.7%	7.8%	34.1%	39.0%	2018
11.5%	-2113.0%	10.6%	29.2%	9.3%	2019
27.0%	-200.3%	5.3%	38.2%	11.8%	2020
43.2%	71.4%	9.1%	5.1%	12.2%	2021
32.91%	-199.65%	12.49%	24.22%	28.77%	Arithmetic mean

Source: The author's calculations performed in (Eviews 12)

The following conclusions can be made from Table 7:

1. Al-Ameen Insurance Company scored first in terms of profit margin, with its maximum value reaching 56.0% in 2013, and its lowest value reaching 14.3% in 2017.

2. Dar Al-Salam Insurance Company is placed second, with a profit margin of 40.5%, while Al-Khaleej and Al-Hamra Insurance Companies are ranked third and fourth, respectively.
3. A dramatic fall in Al-Ahlia Insurance Company's profit margin ratio, which placed last among the insurance companies analyzed during the study period, reaching a low of 2113.0% in 2019.

9. Research models, tests and empirical analysis

Panel data is described as data that incorporates cross-sectional and time-series features (Gujarati, 2003).
Panel data analysis is preferable to temporal or cross-sectional data analysis alone, with several advantages that can be described as regulating individual variance, offering the finest dynamic study, and eliminating the problem of overlooked variables (Baltage, 2005).

9.1 Basic Models for Estimating Panel Data

9.1.1 The general format of the panel data

If there are N cross-sectional observations at T intervals, W. Green's basic formula for regression of PANEL data is:

$$y_{it} = \alpha_i + \beta X_{(it)} + \varepsilon_{it} \quad (1)$$

9.1.2 Pooled regression model formula

This model is regarded as one of the simplest longitudinal data models because the constant term is identical for all sectional units. By rewriting the model in Equation 1, we obtain the aggregate regression model (Aljamal,2012), which is expressed as follows

$$y_{it} = \alpha + \beta X_{(it)} + \varepsilon_{it}, i = 1,2, \dots \dots \dots, Nt = 1,2, \dots \dots . T \quad (2)$$

9.1.3 Fixed effects model formula

The fixed effects model seeks to understand the behavior of each cross-sectional data set individually by varying the cut-off value $B_{0_{(i)}}$ while keeping the slope coefficients B_j constant for each cross-sectional data set. Accordingly, the following format of (Vijayamhanan, 2016) will be considered

$$y_{it} = B_{0_{(i)}} + \sum_{i=1}^{k} B_j X_{j(it)} + \varepsilon_{it}, i = 1,2, \dots \dots \dots, Nt = 1,2, \dots \dots ., T \quad (3)$$

The fixed effects model is also known as the Least Squares Dummy Variable Model, and when the dummy variables D are added in Equation 3, the model looks like this:

The estimation of distinct intercepts for each cross-sectional unit can capture any differences between the units that are not reflected by the observable variables included in the model when dummy variables (D) are included in panel data models. These variations might be caused by unobservable elements like individual traits, unobserved geographical or institutional elements, or other time-invariant elements that might have an impact on the outcome variable.

$$y_{it} = a_1 + \sum_{d=2}^{N} a_d D_d + \sum_{i=1}^{k} B_j X_{j(it)} + \varepsilon_{it}, i = 1,2, \dots, Nt = 1,2, \dots \dots, T \quad (4)$$

Where the term $(a_1 + \sum_{d=2}^{N} a_d D_d)$ indicates the change in the segmental sums of the segment parameter $B_{0_{(i)}}$, resulting in the following model:

$$y_{it} = \sum_{d=1}^{N} a_d D_d + \sum_{i=1}^{k} B_j X_{j(it)} + \varepsilon_{it}, i = 1,2, \dots \dots \dots, Nt = 1,2, \dots \dots, T \quad (5)$$

9.1.4 Random effects model formula

In the event that one of the above-mentioned hypotheses in the fixed effects model is flawed, the random effects model is regarded as an adequate model. Al-Jamal (2012):272.

$$B_{0i} = \mu + v_i \qquad , i = 1,2 \quad (6)$$

And by integrating Eq. 6 into Eq. 2, we get the random effects model as follows:

$$y_{it} = \mu + V_i + \sum_{i=1}^{k} B_j X_{j(it)} + \varepsilon_{it}, i = 1,2 \dots, Nt = 1,2, .., T \quad (7)$$

9.2 Basic tests for selecting a panel data model.

9.2.1 Lagrange Multiplier test

Breusch and Pagan (1980) proposed this test to test the occurrence of the random effect because it is dependent on the lagrange multiplier connected to the mistakes ε_{it} coming from the method of least squares (OLS), and its formulation is given by the following relationship (Baltage, 2005):

$$\mathrm{LM} = \frac{\mathrm{NT}}{2(\mathrm{T}-1)} \left[\frac{\sum_{i-1}^{N} (\sum_{t-1}^{N} \varepsilon_{it}^2)}{\sum_{i-1}^{N} \sum_{t-1}^{N} \varepsilon_{it}^2} - 1 \right] \rightarrow \mathrm{X}_1^2 \quad (8)$$

9.2.2 Hausman test (1978)

This test is based on the amount to which the individual effect is related to the independent variables and the relationship of the Hausman test is presented in the following formula (Asterion and Hall, 2007):

$$H = \left(\hat{\beta}_{OLS} - \hat{\beta}_{GLS}\right)' \left[\text{Var}\left(\hat{\beta}_{OLS}\right) - \text{Var}\left(\hat{\beta}_{GLS}\right)\right]^{-1} \left(\hat{\beta}_{OLS} - \hat{\beta}_{GLS}\right) \quad (9)$$

9.3 Empirical analysis

Three regression models will be anticipated based on three profitability ratios in insurance companies listed on the Iraq Stock Exchange, which are the return on assets, the return on equity, and the profit margin, to investigate gross written premiums and demonstrate their impact on the profitability rates in Iraq Stock Exchange for the period 2010-2021, and the following forms will be developed based on the dependent variable as follows:

A) The first model: Return on assets

$$ROA_{it} = \beta_0 + \beta_1 ISP_{it} + \varepsilon_{it}$$

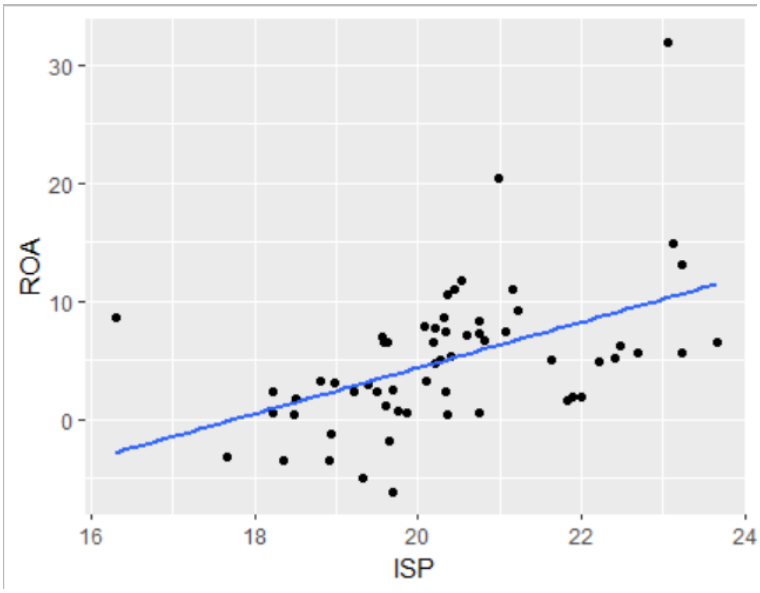

Figure 2. Linearity between GWP and ROA
Source: The author's projection by Eviews 12

Figure 2 shows that GWP and ROA variables have a linear relationship, making it viable to use them further in this investigation.

B) The second model: Return on equity

$$ROE_{it} = \beta_0 + \beta_1 ISP_{it} + \varepsilon_{it}$$

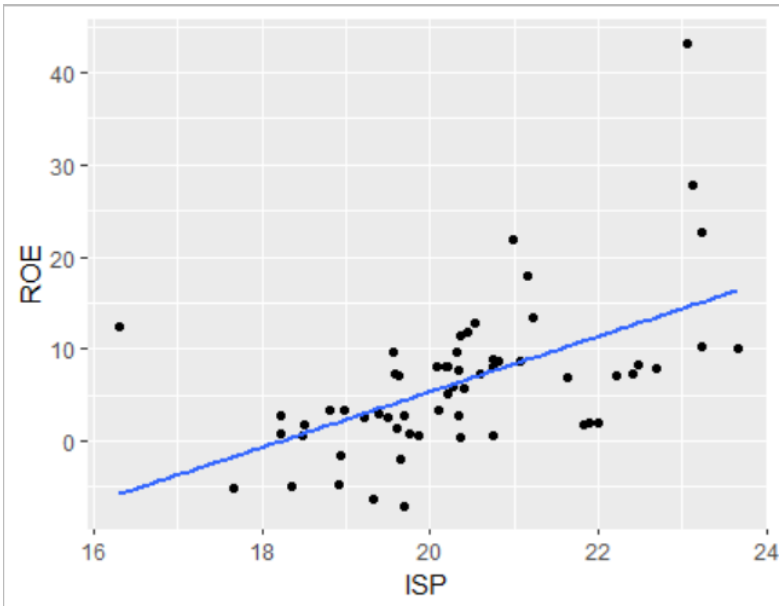

Figure 3. Linearity between GWP and ROE
Source: The author's projection by Eviews 12

Figure 3 presents a linear relationship between the GWP and ROE variables, making it applicable to future assessment.

C) The third model: Profit margin

$$PM_{it} = \beta_0 + \beta_1 ISP_{it} + \varepsilon_{it}$$

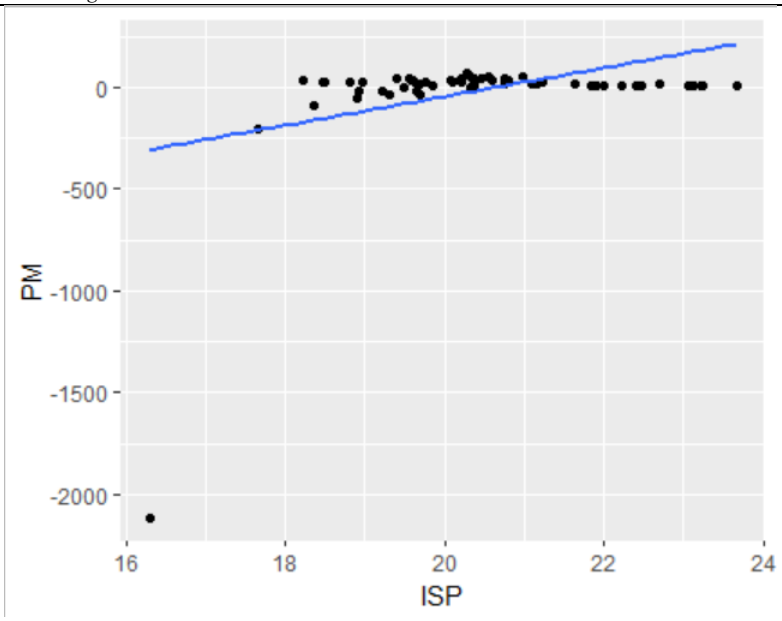

Figure 4. Linearity between GWP and PM
Source: The author's projection by Eviews 12

Figure 4 demonstrates the linear relationship between the GWP and PM variables, allowing us to use panel data from linear regression.
ROA_{it} is the rate of return on assets of company i in year t
ROE_{it} is the rate of return on equity of company i in year t
PM_{it} is the profit margin ratio of the company i in year t
GWP_{it} is the gross written premiums for the company i in year t
ε_{it} is the error limit
The Data Panel data models will be used to determine the research models using the Eviews software from 2010 to 2021. The Pooled Regression Model is used to compare the results and assess the study's assumptions, and data about the companies are gathered from annual reports published in the Iraq Stock Exchange and issued by the companies under examination (http://www.isx-iq.net).

9.3.1 Estimating the first model: Return on assets

The Pooled Regression Model, Fixed Effect Model, and Random Effect Model are the three basic models in the dual data models methodology. Table 8 displays the dual data models for gross written premiums paid and their impact on the return on assets in the Iraqi insurance companies analyzed. Table 8 provides the estimated dual

data models used to calculate the effect of gross written premiums on the return on assets.

Table 8. Dual data models to measure the effect of gross written premiums on the return on assets

Significant regression model			The coefficient of determination	Significance level	Estimated parameters	Independent variables	Sample
Result	Significance level	F					
significance	0.00008	17.8111	0.221	0.0005	-34.43857	C	Pooled Regression
				0.0001	1.939689	ISP	
significance	0.00211	4.35213	0.221	0.1329	-23.50793	C	Fixed Effect Model
				0.0690	1.402813	ISP	
significance	0.00011	17.1067	0.214	0.0007	-34.22593	C	Random Effect Model
				0.0001	1.929244	ISP	

Source: The author's calculations performed in (Eviews 12)

After predicting the three dual data models, the comparison test between the Pooled regression model and random effect model will be carried out to examine the most acceptable one. This will be followed by assessing the validity of the same model using the tests already mentioned in this part. Using the Lagrange multiplier test, a comparison is conducted between the combination regression model and the rest of the dual data models (fixed effects model and random effects model), based on the hypothesis supplied during test submission. The test outcomes are reported in Table 9.

Table 9. Results of Lagrange Multiplier Test for Random Effects

Lagrange Multiplier Test for Random Effects			
	Cross-sectional data	**Time series data**	**Time series data and cross-sectional data**
Breusch-Pagan	0.220406	0.431088	0.651494
Prob	(0.6387)	(0.5115)	(0.4196)

Source: The author's calculations performed in (Eviews 12)

According to Table 9, the probability values of the test statistic for the three examples are greater than 5%, specifically 0.6387, 0.5115, and 0.4196, indicating that the null hypothesis H0 is correct and the alternative hypothesis H1 is incorrect. Therefore, the study can use the Pooled OLS model, and there is no need for the Hausman test. In Table 8, the independent variable (GWP), representing gross written premiums, is found to be positively and significantly related to the return on assets, with a significance level of less than 0.05 and a regression coefficient of 1.93. This means that a one-unit increase in the gross written premiums variable results in a 1.93-unit increase in the return on assets as mentioned in Table 8. The overall coefficient of determination for the model is 0.22, which suggests that the independent variable explains 22% of the changes in the return on assets, while the remaining 78% is due to other variables not included in the model and fall within the random error element. Thus, the mathematical representation of the estimated model is as follows.

$$\widehat{\mathrm{ROA}}_{\mathrm{it}} = -34.43857 + 1.939689\ \mathrm{GWP}_{\mathrm{it}}$$

Table 8 presents the results of testing the first hypothesis and the F test. The first hypothesis will be rejected, stating that "there is no statistically significant relationship between the gross written premiums in the insurance companies listed on the Iraq Stock Exchange and the return on assets," and the alternative hypothesis will be accepted, stating that "there is a statistically significant relationship between the gross written premiums to in the insurance companies listed in the Iraq Stock Exchange and the return on assets", which is relevant to the findings of Rashid and Kemal (2018). The findings of this study indicate that factors such as gross written premium, management expense, size, and interest rate, as guaranteed by Jumaa (2020), have a major impact on the profitability of insurance firms. The study has also determined that the gross written premiums and the rate of inflation have a beneficial impact on the profitability of the insurance industry in the United Arab Emirates (UAE) between 2010 and 2019. Markonoh et al. (2019) approved these results. According to the findings of Kelemu's research from 2021, there is a favorable correlation between good governance and rising premiums and the

financial performance of Indonesian insurance businesses. The final finding of this study was that while leverage and market share have little impact on profitability, business size, inflation, liquidity, premium growth, capital adequacy, and age all have a major impact on it.

9.3.2 Estimating the second model

Table 10 depicts the estimation of dual data models for gross written premiums, as well as their impact on the rate of return on equity. Table 10 provides the estimated dual data models used to calculate the effect of gross written premiums on the return on equity.

Table 10. Dual data models to measure the effect of gross written premiums on the return on equity

Significant regression model			The coefficient of determination	Significance level	Estimated parameters	Independent variables	Sample
Result	Significance level	F					
significance	0.0000	25.016	0.289	0.0000	-54.86460	C	Pooled Regression Model
				0.0000	3.010481	ISP	
significance	0.0000	6.4274	0.315	0.1743	-27.25973	C	Fixed Effect Model
				0.0943	1.654624	ISP	
significance	0.0000	24.372	0.283	0.0000	-54.56479	C	Random Effect Model
				0.0000	2.995755	ISP	

Source: The author's calculations performed in (Eviews 12)

Using the Lagrange Multiplier Test (LM test), a comparison is conducted between the Combination Regression Model and the remainder of the dual data models (fixed effects model and random effects model), based on the hypothesis supplied during the test presentation. The test outcomes are reported in Table 11.

Table 11. Results of the Lagrange Multiplier Test for Random Effects test

Lagrange Multiplier Test for Random Effects			
	Cross-sectional data	Time series data	Time series data and cross-sectional data
Breusch-Pagan	0.066419	0.297673	0.364092
Prob	(0.7966)	(0.5853)	(0.5462)

Source: The author's calculations performed in (Eviews 12)

Table 11 illustrates that the probability values of the test statistic in the three examples are all greater than 5%, with values of 0.7966, 0.5853, and 0.5462. Thus, the null hypothesis H0 is accepted, and the alternative hypothesis H1 is rejected. Therefore, the Pooled OLS model is appropriate for this study, and the Hausman test is not necessary. The significance of the independent variable (GWP) representing gross written premiums is also confirmed in Table 10, with a positive and statistically significant significance level of less than 0.05 and a regression coefficient of 3.010481. This means that a one-unit increase in the gross written premiums variable results in a 3.010481-unit increase in the return on equity as mentioned in Table 10. The overall coefficient of determination for the model is 0.29, indicating that the independent variable, gross written premiums, explains 29% of variations in the return on equity. The remaining 71% is attributed to other variables not included in the model and is classified as the random error component. Consequently, the mathematical formulation of the estimated model is presented below

$$\widehat{\mathrm{ROE}}_{\mathrm{it}} = -54.86460 + 3.010481\ \mathrm{GWP}_{\mathrm{it}}$$

The second hypothesis, which suggests that there is no statistically significant relationship between the gross written premiums in the insurance businesses listed on the Iraq Stock Exchange and the return on equity, is rejected based on the F test and the results presented in Table 9. The alternative hypothesis, which argues that a statistically significant association exists between the gross written premiums in the insurance companies listed on the Iraq Stock Exchange and the return on equity, is accepted, which is consistent with the findings of Kerim et al. (2019). The results

showed that long-term debt and (premium growth) have a positive impact on the profitability represented as (ROE) of insurance companies listed in Nigeria.

9.3.3 Estimating the third model

The calculation of dual data models for gross written premiums and their influence on the profit margin is shown in Table 12.

Table 12. Dual data models to measure the effect of gross written premiums on the profit margin

Significant regression model			The coefficient of determination	Significance level	Estimated parameters	Independent variables	Sample
Result	Significance level	F					
significance	0.0026	9.8999	0.1310	0.0023	-1456.777	C	Pooled Regression Model
				0.0026	70.55746	ISP	
significance	0.0012	4.6933	0.238	0.0002	-2759.187	C	Fixed Effect Model
				0.0003	134.5274	ISP	
significance	0.0012	11.599	0.152	0.0009	-1866.445	C	Random Effect Model
				0.0009	90.67892	ISP	

Source: The author's calculations performed in (Eviews 12)

The summing regression model is compared against the remainder of the dual data models (fixed effects model and random effects model) using the Lagrange multiplier test (LM test) while considering the hypothesis stated during the test presentation, and the results of the test are shown in Table 13.

Table 13. Results of the Lagrange Multiplier Test for Random Effects test

Lagrange Multiplier Test for Random Effects			
	Cross-sectional data	**Time series data**	**Time series data and cross-sectional data**
Breusch-Pagan	0.931923	0.029389	0.961312
Prob	(0.3344)	(0.8639)	(0.3269)

Source: The author's calculations performed in (Eviews 12)

Table 13 presents the probability values of the test statistic in the three examples, which are all greater than 5%. This indicates that the null hypothesis H0 is acceptable, and the alternative hypothesis H1 is rejected. Thus, the Pooled OLS model is appropriate for this research, and the Hausman test is not needed. In Table 12, the independent variable (GWP) representing gross written premiums shows a positive and statistically significant result with a significance level of less than 0.05 and a regression coefficient of 70.55746. This means that increasing the gross written premiums variable by one unit results in a 70.55746-unit increase in the profit margin. The model's overall coefficient of determination is 0.13, implying that the independent variable, gross written premiums, explains 13% of changes in the profit margin. The remaining 87% is due to other variables that are not included in the model and fall under the random error component. Therefore, the estimated model's mathematical formulation is shown as follows.

$$\widehat{\mathrm{PM}}_{\mathrm{it}} = -1456.777 + 70.55746\ \mathrm{GWP}_{\mathrm{it}}$$

In conclusion, based on the results in Table 12 and the F test, the hypothesis "there is no statistically significant relationship between the gross written premiums in the insurance companies listed on the Iraq Stock Exchange and the percentage of profit margin" is rejected, and the hypothesis "there is a statistically significant relationship between the gross written premiums in the insurance companies listed on the Iraq Stock Exchange and the percentage of profit margin" is accepted.
It is crucial to acknowledge that the fundamental gap in the existing literature—the influence of gross written premiums on the profit margin—has not been addressed in earlier insurance sector research. In fact, the majority of the research concentrated on the impact of gross written premiums on profitability (ratios) rather than margin ratios, which were the subject of the current study.

10. Conclusions and recommendations for further research

10.1 Conclusions

The researcher discovered, by an investigation of the theoretical and applied sides, that the fluctuation in the volume of premiums, with rise and decrease, is related to the study's findings, which are as follows:

1. The first hypothesis was rejected, and the alternative hypothesis was accepted, which states that "there is a statistically significant relationship between the gross written premiums and the return on assets." which is consistent with the studies of Rashid and Kemal (2018), Jumaa (2020), Markonoh et al. (2019), and Kelemu (2021).
2. The second hypothesis was rejected, and the alternative hypothesis was accepted, which states that "there is a statistically significant relationship between the gross written premiums and the return on equity." which is consistent with the study of Kerim et al. (2019).
3. The third hypothesis was rejected, and the alternative hypothesis was accepted, which states that "there is a statistically significant relationship between the gross written premiums and the profit margin ratio."
4. It was discovered that the proclamation of the liberation of Iraq from ISIS, the restoration of lands controlled by terrorism, and the return of stability to insurance companies are the reasons for the return of the volume of insurance activity to rise and the remarkable growth in the volume of insurance premiums for the period 2016-2020.
5. By analyzing the gross written premiums, it was found that there is a clear impact of the COVID-19 pandemic, which caused a decrease in the volume of underwriting activity for the insurance sector. This is consistent with the study of Stojkoski and et al. (2021).
6. In comparison to other industries listed on the Iraq Stock Exchange, particularly banks, which came out on top in the category of financial institutions, the market share of the insurance sector is at the lowest levels. Only five of the companies in the Iraqi insurance sector were registered at the Iraq Stock Exchange. While the biggest market shares among the financial institutions listed on the Iraq Stock Exchange is represented by 47 banks registered on the Iraq Stock Exchange.
7. Al-Hamra Insurance Company ranked first in 2011 when the return on equity and return on assets were analyzed, with 32% and 43.2%, respectively

10.2 Recommendations for further research

1. Insurance companies should support the technical advancement of insurance companies and move toward adopting digital insurance by developing strategies for marketing insurance policies electronically in order to avoid a decrease in gross

written premiums when crises occur. This will help them maintain their financial position and future profitability.
2. Training and advancing staff members of insurance companies by enrolling them in courses on electronic insurance policy marketing techniques.
3. Dealing with potential future difficulties and crises. To address the financial hardship faced by many customers paying premiums and to manage the contraction in insurance firms' cash flows, Iraqi insurance companies should adopt a policy of financial allowance for premium payment.
4. It has become crucial to raise customer awareness of insurance through media institutions in order to benefit from the experience that insurance companies had during the COVID-19 pandemic and the fight against ISIS and avoid the issue of decreasing gross written premiums in the future. additionally, urging local government agencies to finalize group insurance agreements for their staff members by visiting them.
5. Create insurance products in the future that are in line with consumer preferences to win over shareholders and customers. This will have a good impact on rising gross written premiums.
6. Due to the increase in customer claims to insurance companies when epidemics and wars occur, which results in a decline in assets and the loss of some of the capital, it has become necessary to increase control over the Iraqi insurance companies and monitor the stability of the companies' capital in order to maintain the financial stability of the insurance companies and face challenges in the future.
7. The inclusion of all Iraqi public and private insurance companies in the market is required to give researchers and investors the chance to obtain information in a transparent manner, similar to its peers from financial institutions such as banks, in order to increase the market share for the insurance sector in the Iraq Stock Exchange.
8. Encourage researchers to consider margin ratios in addition to return ratios when examining profitability ratios, as they are among the most crucial metrics used by analysts to gauge a company's capacity for generating profits and maximizing sales.

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Author Contributions

TR is responsible for the data analysis, interpretation, and drafting of the manuscript. The other authors have provided inputs for the manuscript's content and editing.

Disclosure statement

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