



*DOCTORATE in BUSINESS ADMINISTRATION*

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**FINANCIAL PERFORMANCE OF INSURANCE COMPANIES IN  
RAPIDLY GROWING ECONOMIES: THE CASE OF CAMBODIA**

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## DECLARATION

I, Som Phay, certify that my Executive DBA thesis, "Financial performance of insurance companies in rapidly growing economies: the case of Cambodia," is around 100 pages long, including tables, figures, appendices, and references. This thesis is fully written in my own words, and really, no submission has been made to any university for a degree. A list of references is supplied, and the text recognizes information drawn from other published or unpublished works.

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PHAY SOM

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**Abstract:** The number of participants in the insurance marketplace has grown over the last decade, with 38 companies currently offering services across the country. As a result of the increased rivalry, the dynamics of operations have altered. But literature does not find what affects Cambodian insurance company's financial performance. This research aims to consider traditional and Cambodia's country-specific factors of insurance companies' financial performance in Cambodia. It uses inferential statistics with balanced panel data from insurers for 11 years (2009–2019). It deploys explanatory analysis where OLS regression models examined the association between dependent and independent variables. Results will show general factors and factors specific to the Cambodian context, which will help improve financial performance in insurance companies. Organizations can prioritize these factors in their strategies. The research examines the correlations between many elements and insurance companies' financial performance in order to ensure that their assets are liquid enough to meet both present and future commitments. The research also revealed that regulators and financial management reduce the impact of Cambodia's contextual elements on the insurance companies' financial performance. They may do so by taking steps to boost the country's real GDP, which will boost the country's economic development as well as the insurance industry's.

**Keywords:** Financial Performance, Insurance Companies, Rapidly Growing Economies, Cambodia.

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## ABBREVIATIONS

AC: Autocorrelation

CIPFA: Chartered Institute of Public Finance and Accountancy

CLRM: Classical linear regression model

CP: Contingency planning

CPI: Cost per Impression

CS: Company Size

DW: Durbin-Watson

EPS: Earnings Per Share

ERM: Enterprise Risk Management

GDP: Gross Domestic Product

GICos: General Insurance Companies

IAC: Insurance Association of Cambodia

IMF: International Monetary Fund

INF: Inflation

LEV: Leverage

LIQ: Liquidity

LSDV: Least square dummy variables

MEF: Ministry of Economy and Finance

MVA: Market Value Added

OECD: Organization for Economic Co-operation and Development

OLS: Ordinary Least Squares

PAC: Partial Autocorrelations

PGR: Premium Growth

PMS: Performance Measurement System

RBV: resource-based view

ROA: Return on Assets

ROE: Return on Equities

ROI: Return on Investments

ROS: Return on Sales

UWR: Underwriting Risk

VOC: Volume of Capital

WTI: West Texas Intermediate

## INTRODUCTION

### i. Research Background

Everyone on earth is subject to financial loss because of an accident, fire, or company, as well as natural disasters like death. People need to be protected from these treats. Organizations, corporations, and people depend on insurance companies to protect them from financial losses. Insurance is a big part of the financial services business in almost all emerging and developed countries. It also reduces transaction costs and improves economic growth and resource allocation efficiency. It also helps with investment scale economies, liquidity generation, and the spread of financial losses (World Bank, 2003).

"Performance is the correlation between a company's strategic effectiveness and operational efficiency. A company's main goals are to improve its production methods, products, services, and market management. Profitability is linked to a business's financial performance. The business's financial performance may be quantified in a number of ways, such as a gross margin rate, "return on equity (ROE), and return on assets (ROA)." The business's financial performance is important in drawing the focus of researchers, experts in finance, and other business top management. Selecting a successful firm is a difficult task. As a result, they must be worried about the firm's profitability. According to Doumpos, Gaganis, and Pasiouras (2012), the financial success of the insurance sector is significant to many partners, such as agents, policyholders, and policymakers.

The worldwide financial meltdown harmed emerging and developed economies, and because of these crises, risky and costly events have occurred in the United States. As a result, several countries have been affected by the crisis (Khasawneh, 2015). In 2009, the economies of the main developed countries were in free fall. Their trading habits and volumes were severely affected. Overall, worldwide trade volumes declined 13% in 2009 compared to 2008, according to the OECD's forecast (McKibbin and Stoeckel, 2009).

Insurance seems to be a sociological tool that protects human being and their risks as well as events that aren't predictable. Insurance companies must make a profit while also serving their nationality as risk savers for insurable risks. The research focuses on investigating "the financial performance of insurance companies in Cambodia." In this study, a quantitative method was used. It has been 11 years since 2009 that the researcher has used balanced panel data and inferential statistics from insurance firms. Pearson's correlation and OLS regression models are

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used in explanatory analysis to look at how dependent and independent factors are linked together in order to figure out why they are linked together.

Cambodia opened its insurance industry to both domestic and foreign investors when the Law on Insurance was enacted on July 25, 2000 (Insurance Law 2000) and issued Sub-Decree No. 106 on Insurance dated October 22, 2001. The Ministry of Economy and Finance subsequently issued various lower-ranking regulations, including prakas, circulars, and notifications concerning banking or financial matters and other regulations subsequently to supervise and regulate the insurance business in Cambodia under the jurisdiction of the Ministry of Economy and Finance (Jay Cohen, 2020).

Within these two decades, the insurance market in Cambodia has been developing and growing at different stages. In the first stage, from the year 2000 to 2002, there was only one state-owned insurance company in the insurance market in Cambodia. From 2003 to 2009, there was continuous private investment in general insurance companies. The last stage started in 2009 and continues to the present. There has been an investment in the life insurance business to sell life insurance products in the form of protection and saving. Meanwhile, in 2011, the Royal Government decided to grant micro-insurance companies a temporary license to serve the market, particularly low-income households in rural areas (Insurance regulator of Cambodia, 2021).

The young insurance industry in this developing country faced issues such as liquidity and receivership as a result of its practices and management. These issues might have been caused by a product designed improperly, and the company has received more claims that it might have been caused by underwriting and actuarial issues. Or they could not find a good reinsurance company to help them because their insurance market is small and it has not attracted a world-class reinsurance company yet. Climate change is also an issue that creates risks, such as drought and flooding. At the same time, the inflation of hospital expenses could be a subject of the failure too.

## **ii. Problem Statement**

Without insurance, the corporate world would be unsustainable, as risky enterprises might not mitigate many risks (Ahmed, 2010). In comparison to other nations, Cambodia's contribution to GDP from insurance is quite modest, at 0.93 percent in 2019 (Ministry of Economy and Finance, 2019). Cambodia has less than 1% of the population insured, compared to Malaysia's 41% life insurance. Some insurance companies in Cambodia aren't doing well, and this research is trying

to figure out if poor financial management is to blame. The Ministry of Economy and Finance performed the research in 2019.

From the year of 2000 to 2019, one microinsurance company was liquid and the other four insurance companies were put into formal receivership, which is when a company goes into debt. Insurance companies give distinct financial services to every economy's growth and development. These changes in liquidity and receivership are scary for insurance companies (Ministry of Economy and Finance, 2020).

The financial performance of Cambodia requires a management approach to financial management procedures. A new study from the World Bank and IMF says that empirical research on how insurance companies handle their finance seems to be limited to developing countries.

### **iii. Research Question**

The research's main aim is to respond to the research questions, which are as below:

**What are the factors of financial performance to consider in the Cambodian insurance industry?**

The following two sub-research questions are proposed and listed as follows:

1. What factors influence "the financial performance of insurance companies?"
2. How to account for the Cambodian context in the model of "the financial performance of insurance companies?"

### **iv. Research Objective**

As stated in the research background and in the statement, this research has four main objectives that it wants to achieve as below:

1. To identify the factors influencing "the financial performance of insurance companies,"
2. To identify the additional determinants of "the financial performance of insurance companies" in the Cambodian context,
3. To suggest regulatory improvements for insurance companies in Cambodia
4. To suggest financial management improvements to insurance companies in the Cambodian context.

**v. Research Significance**

The purpose of this research is to learn more about how insurance companies in Cambodia are doing financially. Knowing that financial performance will be beneficial to several groups of people:

1. Top management can implement an effective policy to improve financial performance and reduce risk in their company.
2. The middle management might set an effective sub-policy to implement the top management's policy.
3. Local management might apply a financial performance policy effectively.
4. Finally, the research also provides an appropriate model of “the financial performance of insurance companies in Cambodia” for students and other researchers.

**vi. Scope of the research**

The research has investigated the Cambodian country-specific factors of financial performance to be considered by the insurance industry. The panel data used for the analysis comprised thirteen insurance companies from 2009 to 2019. The dependent variable was assessed by ROA and ROE, whereas the independent variables were micro and macroeconomic factors, which were determined by firm size, leverage, premium growth, volume of capital, liquidity, underwriting risk, DGP, and inflation and its correlation to the insurance companies' financial performance. For this research, the insurance company's financial performance was analyzed by the profitability dimension.

**vii. Limitation of the research**

Limitations are restrictions that are additional to the researcher's control, but they might have an impact on the research's final results. This research was carried out by collecting secondary data. We obtained the data from insurance companies' audited financial reports under investigation, obtained from the Ministry of Economy and Finance, and the annual report of each insurance company. The findings are based only on secondary panel data, as well as secondary panel data's restrictions may have an impact on the conclusions. Secondary panel data was obtained from the income statement and the balance sheet, which were only created at year's end.

The research was limited to the factors that influence insurance firms' financial performance in Cambodia. There are other macroeconomic factors, like interest rates, the fluctuation of the

currency rate, and the supply of money, that aren't covered in this study. GDP and inflation were used. The data for the macroeconomic factors was collected from the World Bank website.

The research's sample population was comprised of thirteen firms providing insurance in Cambodia. Therefore, thirteen insurance firms from the target were chosen as a sample, while twenty-five insurance firms were excluded from the sample because they were either recently created (i.e., they were not operating before 2009) or if the data could not be retrieved. This study is based on data from firms' insurance that has been chosen for 11 years (2009–2019). The data comes from secondary sources. The time frame is utilized to gather current and relevant data for the research.

#### **viii. Organization of the research**

The research comprised the first part, three chapters, and the final part of the research. The first part is an introduction. Chapter one is a literature review, which presents the insurance companies' financial performance in Cambodia; a theory review; empirical research; a conceptual framework; variable and hypothesis development; and a conceptual model. Chapter two is an empirical analysis, which presents a research method, results, and robustness checks. The third chapter is discussion, which includes a discussion of research findings, a summary of findings, recommendations, and research implications. The final part is the conclusion.

#### **ix. Summary of the introduction**

When the researchers start their research, they need to talk about what they will discover, what they're going to learn, and how they intend to go about it. The introduction discusses the research context, problem statement, research question, research aims, research importance, study scope, research limits, and organization. Chapter One will start with a literature review, which will include the idea of insurance companies' financial performance in Cambodia; a theory review; empirical evidence; hypothesis development; and a conceptual model. It will also include a summary of the chapter.

## **CHAPTER ONE**

### **LITERATURE REVIEW**

This chapter consists of the literature review; related theories; the conceptual framework of dependent and independent variables; and the empirical literature review of different researchers; their conceptual framework, hypothesis development, and the conceptual model of the research. It comprises six sections. The first part discusses the conceptual literature review. Within it, the concepts of financial performance, economic growth, and insurance companies are defined. The associated theories are discussed in the second part. The third part explains how dependent and independent variables are conceptualized. The fourth part describes the empirical literature review of different researchers (knowledge gap) and their conceptual framework. The fifth part is titled “hypothesis development.” And the final part of this chapter is the conceptual model.

#### **1.1 Insurance companies’ financial performance in Cambodia**

In this section, we will discuss how insurance businesses in Cambodia measure and think about their financial success, as well as how they do financially and how they grow their businesses.

##### **1.1.1 Concept of Insurance Companies in Cambodia**

Scholars from across the world have come up with different definitions of insurance. According to Kunreuther (2010), insurance is a financial institution that allows two parties to agree to shift financial risk from an individual or organization to a pooled collection of risks through a two-party agreement. Assured receives a set coverage amount for damage and loss, which is an unknown future occurrence, for a lower but guaranteed payout. Insurance, according to Igbojekwe (2006), is a contract in which the insured gives the insurer the risk of possible loss, and the insurance company promises to pay the insured back if the insured loses their assets or life, even if the insured doesn't. In exchange for this assurance, the insured pays a predetermined amount, known as a premium. The promise is referred to as the insured, while the promisor is referred to as the insurer.

According to Hifza (2011), insurance is critical to the commercial success of infrastructure enterprises. An insurance company offers stability in the financial and social spheres, as well as mobilization and directs funds, promotes trade, business, and entrepreneurship, and enhances the quality of life for people as well as a society’s general well-being. This means, Abate (2012), that insurance firms help a country's economy in one sense by transferring and dispersing risk, perhaps increasing confidence

in the occurrence of unpredictable occurrences. In another sense, insurance firms, like other financial organizations, serve as financial mediators, allowing money to be transferred from one party to another.

The insurance industry is separated into several divisions, but the general insurance business and the life assurance business are the most common. General insurers are seen as risk-takers, whereas life insurers are thought to be financial middlemen (Chen and Wong, 2004). Many general insurance plans include bond, accident, fire, motor, oil and gas, engineering risks, contractors' all hazards, credit insurance, marine, and suretyship, and so on. It is an agreement between both the assure and the policyholder wherein the assure accepts responsibility for the payment of the policyholder's benefits in the event of a certain occurrence. Individual life insurance, group life insurance, pensions, health insurance, and annuities are all part of the life assurance sector (Suheyli, 2015).

The insurance market in Cambodia has rapidly grown in total gross premiums with an annual average growth of around 26%. In 2019, the gross premium continued to rise by about 28%, which added up to around USD 253 million in 2019, as shown in Figure 1-1: Graph 1-1 in Appendix F. Aside from that, the insurance industry's financial position, such as the total assets, total equity, and total liabilities, as shown by Figure 1-3: Graphs 1-3 in Appendix F, is still small compared to ASEAN countries. This is because the insurance industry has a lot of assets but not much equity or liquidity (Cambodia's Ministry of Economy and Finance, 2020).

With the upsurge in the size of the Cambodia insurance market in 2019, the insurance sector contributed to the economy at a penetration rate of 0.93% with an insurance density of USD 15.34. The annual growth rate for insurance penetration is around 17%, and the annual growth rate for density is around 26.44%. Aside from that, the insurance penetration rate has increased by around 16% in 2019 and the insurance density rate has increased by around 26.78%. Nevertheless, if compared to other countries in the ASEAN countries, such as Singapore, Malaysia, and Indonesia, which have an insurance penetration rate of 8.8%, 4.5%, and 1.7% and an insurance density rate of \$5,764, \$508, and \$72 per person, respectively, Cambodia's insurance penetration rate and insurance density are relatively lower than those of other ASEAN countries, except Myanmar and Lao PDR. These signs show that there is still room for the insurance market in Cambodia to grow and bring in more investors, as shown in Figure 1-4: graphs 1-4 and Figure 1-5: graph 1-5 in Appendix F (OECD, 2020; Cambodia's Ministry of Economy and Finance, 2020).

### **1.1.2 Financial Performance**

The achievement of a specific task judged against specified standards and considered the fulfillment of responsibility is referred to as "performance." Performance can also refer to the time and effort put in to achieve a specific goal. The achievement of the goal requires a mix of human, financial, and organizational resources. Al-Soub, Almajali, and Alamro (2012) defined performance as an output produced by a group or an individual within a corporation in response to responsibility and the authority to be given to attain a formally defined objective. It did mean that the business was able to come up with new ways to get and use resources so that it could be more competitive and reach its goals.

Financial performance is a monetary indicator of such things as a business's financial strength and health, and it may be used to compare the profitability of other businesses in the same industry or across industries. It is very important that insurance businesses make money. This helps to grow the industry, which in turn helps the economy (Iswatia and Anshoria, 2007). Good performance shows how well a business is able to use the resources it has to make a good profit and achieve its goals.

According to Chen et al. (2004), insurance company performance is measured by net premium earned, underwriting activities' profitability, ROA, annual turnover, return on investments (ROI), and ROE. According to Indranarain (2009), these indicators could be divided into two groups: profit efficiency metrics and investment efficiency metrics. "Profitability is calculated as the sum of revenues and expenses, less expenses." Macroeconomic, firm-specific, and industry-specific factors all impact the insurance companies' possibility of profit. There are two types of investment performance. One is the ROA other than cash used in the firm, and the other is the ROI operations of the excess cash gained on operations.

According to Hifza (2011), the financial success of enterprises can therefore be measured by calculating their profitability. In this ever-changing and competitive globalized world, insurers cannot attract external investors' cash unless they are profitable. Profit enhances insurers' solvency and is critical in encouraging policyholders and shareholders to provide funds to insurance companies (Harrington and Wilson, 1989). Insurance company management wants to improve the company's financial performance so that it can make a profit, which is an important part of any insurance business.

Financial ratios are used to highlight distinct aspects of financial performance in financial statements. Some of the finest gauges of a company's financial performance include ROA, ROE, and earnings per share. Most financial professionals consider ROA to be a good indicator of the “financial performance of insurance companies.” When the ROA ratio goes up, it means that the connected business is doing well financially, and when it goes down, it means the opposite (Epps and Cereola, 2008).

Based on previous research, this research determines “ROA and ROE as means to measure the financial performance of insurance companies in Cambodia.” “In terms of financial performance, it also includes financial risk,” and the researchers looked at the financial risk factors that were linked to the insurance companies’ financial performance in Cambodia.

Simply expressed, financial risk refers to a variety of hazards associated with financial transactions. It is also known as the risk of investors losing funds if the firm invests in a business for which the fund flows do not match its maturing commitments. According to Barges (1963), financial risk is the greater unpredictability of equity owners' net cash flows as a result of fixed financial obligations related to debt financing and cash leasing. The prospect of cash insolvency is also a financial concern. If you can't pay back your debts with cash from your business, you could lose your business. This risk is determined by how spread out your business's net cash flows are, how much money you have to pay back, and how much money you have available to pay back debts (Jacques and Nigro, 1997). In the same approach, Allen and Santomero (1997) discuss how financial or business risks have become more important because of a range of factors such as price swings, interest rate variations, increasing competition, and higher deregulation. Businesses now have a new way to protect themselves from financial risk shocks thanks to derivatives, which act as hedging tools (Bartram, Brown, and Conrad, 2011).

According to Holton (2004), financial risk is the unpredictability and/or volatility of financial returns. This would include market risks, liquidity risks, and credit risks, which are all types of risks in the financial world. According to Kithinji (2010), financial risk management approaches refer to the activities and processes employed by managers to safeguard a company against market risks, liquidity risks, and credit risks. A management of financial risk method is a way to make sure that your money is safe from things like “market risks, credit risks, and liquidity risks.”

Insurers are in the business of taking risks. They take on a variety of actuarial and financial risks when offering insurance and other financial services. There are risks in the solutions that insurers offer to clients to protect them from actuarial risk. The insurer doesn't take on all these risks itself. A lot of the time, the institution will use correct business practices to mitigate or limit financial risk and the actuarial that comes with a deal. In other cases, it may use a mix of pricing and product design to shift the risk to third parties. People in charge of a business only have to deal with the risks that can't be eliminated or passed on to someone else. This is because the insurance sector understands it needs to change (David and Anthony, 1997).

Liquidity risk is the extent to which debtors who are due in the future could be satisfied with assets or cash that could convert them into cash. The current assets to current liabilities ratio is usually used to calculate it. It shows that the company can quickly turn an asset into cash and that it can manage its working capital on a regular basis. When external finance is unavailable or too expensive, a corporation may fund its operations and investments using liquid assets. Liargovas and Skandalis (2008) say that if a company had more money, it would be better able to deal with unexpected events and pay its debts even if it didn't make a lot of money.

Gerald and Ulrike (2001) define liquidity risk as the risk of not being able to satisfy payment commitments on time. Liquidity is determined by the speed and degree to which an investment may be turned into cash. The capacity to turn the investment into cash, on the other hand, is determined by a variety of criteria that influence the liquidity risk's breadth. When a company's credit rating goes down because of bad press or rumors of problems with other companies in the same or related field, it might need cash right away.

Maintaining a high level of liquidity might result in a lack of managerial discipline in both underwriting and investing. Owners who have a lot of liquid assets may have to pay more for their agents because managers can take advantage of the benefits of having a lot of money. Having liquid assets that must be reinvested quickly means that they have a high risk of losing money when they are reinvested. The risk of reinvestment would undoubtedly put a company's profits under strain. Insurance firms with lower liquidity have a higher probability of outperforming those with more liquidity. Still, if you follow the right steps, you can reduce agency costs and the risk of reinvestment by a lot (Adams and Buckle, 2000).

According to Anthony et al. (1997), the possibility of a funding crisis is known as “liquidity risk.” While some may argue that planning for development is necessary, the danger here should be seen as the possibility of a funding shortfall. Unexpected occurrences, such as a legal challenge, a large claim, a loss of confidence, or a write-down of assets, would almost certainly occur. Insurance companies’ liabilities are liquid. Because they operate in marketplaces where there is a possibility of receiving natural disaster claims or huge demands for policy surrenders and/or withdrawals due to the fluctuating rate of interest, if they are investing in real estate and private placements, their assets may not be as liquid as they used to be. It's crucial for an insurer to have adequate cash on hand to satisfy any payment requests in this situation. Otherwise, an insurer that could continue to operate if no unexpected cash needs arose would be forced to sell assets that are difficult to sell at low prices. This could lead to big losses, increased cash needs, and even bankruptcy.

Underwriting risk refers to the potential that “the premiums obtained will not be sufficient to cover the cost of coverage.” Estimates of prospective claim expenses, as well as the costs of issuing and running the policy, are used to determine insurance premiums. It’s possible that the assumptions and estimates used to create the pricing policy are incorrect. Assumptions may have been wrong, laws may have changed, and more severe weather disasters than expected could be to blame for this (Ernst and Young, 2010).

According to Adams and Buckle (2003), underwriting risk, which is assessed by the loss ratio, which will be the ratio of gross claims to gross written premium, shows how effective the insurance firm’s underwriting efforts were. The adequacy, or lack thereof, of insurers’ underwriting is reflected in underwriting risk.

As Arif and Showket (2015) point out, the financial success of an insurer is determined by its underwriting criteria. The underwriting risk is determined by the risk appetite of life insurers. According to Fama and Jensen, enterprises with risk-averse managers, for example, are more likely to have a lot of different cash flows than those that do risky things (1983). So, “underwriting risk has a negative correlation with the financial performance of insurance companies,” since taking on too many risks can make a company less stable by increasing costs.

Arif et al. (2015) go on to say that insurance businesses with large yearly insurance losses may see their ex-post business management expenditures, such as claims assessment and loss

adjustment charges, increased by insurance businesses, which may see a drop in their reported financial performance. Insurance businesses and reinsurers that have significantly decreased their yearly losses are more prone to perform well financially since they don't have to pay as much for monitoring and claim processing, for example. Underwriting is the process of figuring out which risks have made money in the past and deciding which risks don't meet the insurer's underwriting requirements. Favorable risk selection underwriting frequently results in a favorable loss ratio. After losses and expenditures are deducted from the premiums paid, the insurance makes a profit. To prevent being a victim of adverse selection, insurers must properly underwrite all risks. Discrimination against the insurance company is referred to as "adverse selection." It refers to the tendency of people who have a higher risk of losing money to buy insurance.

Underwriting risk is the process of assessing an insurance issue, such as a property, a profession, a person, another entity, or a business, and deciding whether or not it should be insured. The insurance processing procedure would not be complete without underwriting. Underwriting is the process of determining whether or not a covered entity has an inherent aspect and, if that's so, what premiums should be paid is known as underwriting. Insurance companies are unable to accept all applicants. An insurer owes it to its current policyholders to ensure that it will follow through on its contractual obligations under current policies. If the insurer provides policies to people who aren't covered or who demand premiums that the insurer can't pay, the insurer may be unable to fulfill its contractual obligations (Temecula, 2001).

A for-profit insurance firm seeks to maximize profits while expanding its customer base. Nobody likes to let a customer down unnecessarily. During the underwriting process, all of these factors must be taken into account. Insurance companies aren't necessarily "victims" of the underwriting process; they might sometimes be the source of the problem. For example, insurers have awarded insurance in the past based on post-claim underwriting (now illegal). Individuals who sought to file claims were subjected to rigorous examinations of their applications to establish that they had not properly disclosed a condition. The firm refused to pay out on the claim because the applicant misrepresented the condition. Instead, the policy would be revoked (Temecula, 2001).

Underwriting takes both the risk of figuring out the price and the risk of something happening when you write a policy. There is a risk that claims, and expenditures will be larger than premiums paid before the covered event, so there is a pricing risk prior to the protected

occurrence. It's also known as the risk of insurance premium insufficiency or inadequacy, since it shows that the rate of loss incidence has shifted in the opposite direction of the premiums' estimations. For this reason, it's often referred to as "premium risk," because the insurer is unlikely to be able to collect enough money from premiums to cover the claims. Catastrophe risks are included in the property and liability price risks, which arise from catastrophic catastrophes not properly covered by reserve risk or the premium. Jakovcevic and Mihelja (2014) say that two factors that affect life insurance rates are the risk of withdrawal and biometric risk. Biometric risk is made up of longevity, death, disability, and disease.

Additionally, according to Jakovcevic et al. (2014), the insurance business puts them at risk because they must deal with underwriting risks. Any insurance policy carries the risk of an insured occurrence and a large number of unplanned losses. Underwriting risk is unpredictable and unexpected due to the structure of insurance contracts, which relates to the uncertainty of insurance. A policyholder and an insurer enter into a legal arrangement in which the insured agrees to pay the premiums for the insurance in return for the insurer's committing to reimburse the policyholder if the covered event happens.

### **1.1.3 Economy Growth**

Insurance profitability is projected to have a favorable impact on GDP, as defined by the real annual GDP growth rate. Economic growth can help insurance companies make more money by raising people's incomes, especially GDP per capita income and family income. Individuals', families', and enterprises' desire for security will rise as their income rises (the necessity to protect people, corporations, and other resources). People buy insurance policies because they are afraid of danger or uncertainty, and they pay a premium based on whether they want life, non-life, or health insurance. As a result, premium hikes will boost insurance firms' profits if claims are paid in typical circumstances. When the economy is weak, however, all of this is reversed (Kozak, 2011). Tadesse found in 2013 that an increase in GDP is linked to an increase in profits for insurance companies.

Bashir (2003) found that the influence of good macroeconomic conditions on performance indicators is beneficial. According to Pervan and Kramaric (2012), GDP per capita has a favorable and considerable impact on performance. Except for the inflation rate, Srairi (2009) explored whether all macroeconomic indicators are positively significant in explaining profits. Merin (2012) found that none of the outside factors, including the GDP growth rate, had a big enough effect on the profitability of insurance during the study period.

This section presented the concept and measurement of insurance companies; financial performance; financial risk; and economic growth. To continue from this section, the researcher will present the theoretical review in the next section. The theoretical review will look at the relevant theories of this research.

## **1.2 Theoretical Review**

A Theoretical review investigates ideas that enlarge on the research issue and, as a result, aids in acquiring a deeper grasp of the research in question while also providing justification for the current study. This investigation will be based on the following theories:

### **1.2.1 Agency Theory**

Agency theory is a contract between the owner (principal) and the managers (agents) that describes how to effectively structure interactions in which one party specifies the task while the other performs it (Jensen and Meckling, 1976). The primary challenge to the theory of agency is how to properly structure contracts between owners and managers such that their interests are aligned. According to Jensen et al. (1976), management, as the representative of the shareholders or principal, was supposed to make decisions that maximize shareholder value even if it was in the manager's best interest to grow his personal wealth. Most of the time, however, stockholders and agents are in a conflict of interest. The interests of the firm's management are well known to diverge from those of the shareholders. Rather than striving to maximize expanding profitability, which is in the best interests of shareholders, managers can take steps to promote economic fulfillment, such as obtaining investments and loans. When a mechanism is put in place to protect the interests of shareholders, it could cause a conflict of interest.

As a result, there are two different directions of interest in the organization, each of which strives to fulfill the firm's goal. The difficulty with the agency is caused by a problem. Many managers strive to increase the firm's size by expanding in ways that are unfavorable to the principle. Agency issues are frequently caused by differences in aims between shareholders and agents of a corporation (Arifin and Ratnawati, 2012). The existence of agency issues would cause internal costs for shareholders to address the issues. These expenses are referred to as "agency costs."

Internal costs incurred because of the agent and principal's clashing interests are referred to as "agency costs." Fundamental inefficiencies, dissatisfactions, and disruptions, such as principal-agent conflicts of interest, in which the acting agent receives payment for agency

charges, contribute to this cost. If everything else is the same, lower agency costs indicate superior performance and, hence, higher company values. According to agency theory, management and owners have opposing interests (Jensen et al. 1976). Lambert (2001) says that management and ownership roles and responsibilities must be separated to avoid agency conflicts. They show that the cost of monitoring is paid by stakeholders regardless of who pays for it. To cover the cost of monitoring, debt holders impose a higher rate of interest. The lower the firm's worth, the higher expected monitoring expenditures, and the higher the rate of interest to its investors will be if everything else stays constant.

The following are three kinds of agency costs that may be used to illustrate why the capital structure is important. Asset substitution effect: when the debt-to-equity ratio rises, management is more inclined to engage in riskier ventures. This is because if the project succeeds, stockholders receive all of the benefits; if it fails, loan holders receive all of the risks. If the projects are completed, the firm's value may decline, resulting in a wealth transfer from debtors to the owner of the share. If debt is unsafe, the project's profit will flow to debt holders rather than shareholders, creating an investment dilemma. As a result, even if positive net present value initiatives have the potential to improve company value, management has an incentive to reject them. Unless free cash flow is delivered to shareholders, management has a vested interest in destroying the firm's value by expanding its empire, bonuses, and other means. Increasing leverage forces management to be more financially disciplined.

“The variation in profit among insurance companies in a country over time would imply that internal or firm-specific factors have a significant impact on their profitability,” and it is generally accepted that macroeconomic factors influence insurance companies' financial performance. Because these factors can help management, the government, investors, and customers, it is important to figure them out. To do so, it's helpful to look back at the considerations various people considered in the past.

Internal factors in insurance businesses have an essential part in operational efficiency and their influence on financial performance, according to the following works of literature. The random effect model was used by Leong, Zainudin, Shahnaz, and Mahdzan (2018), who found that the amount of capital, size, underwriting risk, and other factors all play a role in the profitability of Asian life insurance companies. Liquidity, premium growth, and asset tangibility

are all minor determinants of these life insurance companies' profitability. Eling and Marek (2012) examined 35 German and UK insurance businesses from 1997 to 2010 using “two-way panel regression analysis with fixed and random factors.” Researchers found that liquidity, size, capital structure, and the growth of a corporation’s economy all have a positive effect on stock prices.

### **1.2.2 Dynamic Capability Theory**

The hypothesis was initially proposed and developed by Teece, Pisano, and Shuen (1997). The word is used to describe the ability to combine, grow, and change external and internal skills so that one can quickly adapt to changing conditions. These allow businesses to sustain dominance and develop competitive advantages to fulfill their objectives. In an ever-changing environment, organizations and their people require the ability to adapt quickly and generate strategic assets. New strategic assets must be integrated into the organization, including capability, technology, equipment, highly qualified people, and customer feedback. In other words, “dynamic capability” refers to a company’s ability to learn, to create new assets as well as to change old ones.

Teece is a character in the film Teece (2009). To handle new problems, three dynamic talents are required. To solve the issues they encounter, organizations and their people must be able to quickly pick up new information and develop assets of strategic importance. New strategic assets must be integrated into the organization, such as capability, technology, and consumer input. Existing strategic assets must be redesigned or altered. Product design and development routines, for example, are processes that create a well-balanced asset combination. The value of such co-specialized assets is greater when they are combined than when they are used alone. A firm can gain a better long-term competitive edge by combining diverse types of assets.

According to Grant (1996) and Teece and Pisano (1994), organizational and strategic processes wherein management adjusts their base of resources, acquires, and loses resources, implements, and recombines them to develop new value-creating strategies are antecedents of dynamic capabilities. Dynamic capabilities, according to them, comprise identifiable and specified procedures with some integrating and combining of resources. Product design and development routines are the ways that managers use their different skills and experience to make money-making items and services. Managers employ transfer procedures, which include routines for replication and brokering, to duplicate, move, and recombine resources, particularly measures,

according to Hansen (1999). Another problem is that measures are still vague and their interrelationships are unknown (Malmi and Granlund, 2005).

According to Kollie (2017), the theory implies that different businesses cannot have equal skills, resulting in a disparity in financial performance. The study's theory proposes that the changing external environment generates differences in organizations' dynamic capacities. Special organizational routines for receiving and processing information, combining customer experiences with business design choices, and competitive advantage also involve the integration of external activities and technologies, such as alliances and the virtual company, to name a few examples. As a result, businesses that have a competitive advantage in terms of internal competencies are more likely to succeed. This means that insurance businesses' performance is mostly defined by their ability to gain, align, and integrate their skills to get a competitive edge.

In this research, the theory makes the assumption that it is impossible for organizations to have similar capabilities and that this results in a difference in their performances. The theory's proposition to the research is that the external environment causes a difference in the dynamic capabilities of organizations. Therefore, companies that are advantageous in terms of their internal capabilities are more likely to perform well. This means that insurance companies' performance is mostly based on how well they can acquire, align, and integrate their capabilities to get a competitive advantage.

### **1.2.3. Risk Management Theory**

Risk management is the process of identifying, analyzing, and prioritizing risks as well as deploying resources in a coordinated and cost-effective way to reduce the chance and/or impact of bad things happening or to maximize the chances of good things happening (Wenk, 2005). Effective risk management may benefit all companies, large or small, public or private, in a variety of ways (Phuengam and Ranong, 2009). Having better financial performance, a stronger foundation for strategy development, more effective service delivery, and a competitive advantage are just a few of the benefits. Fewer surprises, more change initiatives, and better value for money are just a few examples (Wenk, 2005).

According to Dorfman (2007), developing a strategy based on well-defined risk management principles and then integrating them is the first step in ensuring that an organization

employs risk management in a cost-effective manner. Some of the risk management methods include “corporate risk management practices,” “operational risk management practices,” and strategic risk management practices. financial risk management methods.

Performance metrics, according to Dixon, Nanni, and Vollmann (1990), are those that enable companies to guide their efforts toward accomplishing their strategic objectives. According to Ashelby and Reid (2002), performance can be assessed using subjective or objective criteria. The difficulty of gathering qualitative performance data from small businesses, as well as the dependability of such data because of variances in accounting procedures employed by businesses, are also arguments for subjective assessments. Firms must focus on maximizing profit to survive and flourish in a competitive market, or they will eventually be forced out of business (Dutta and Radner, 1999). According to John (2011), only efficient enterprises remain in the market, whereas less productive firms will eventually quit many marketplaces. Organizations can use performance measurements to control their financial as well as performance on a non-financial basis.

Accountability is also raised and improved, making sure that the company's goal of giving better service and pleasure to customers is met. Stern, Stewart, and Co. created Market Value Added (MVA) as a measure of the extra value a firm has provided to its owners over the whole of their investments (John, 2011).

Conventional financial performance metrics are used to rank companies by their profit growth, total returns, net margin, sales growth, ROE, and more. Other financial criteria, according to Dwivedi (2002), should include long-term investment value, financial health, and the use of corporate assets. John (2011) used three metrics to evaluate accounting-based performance: ROA, ROE, and ROS. To calculate each indicator, “net income is divided by total assets, total common equity, and total net sales.” Researchers have used profitability, ROI, and earnings per share (EPS) to measure a company’s financial performance in the past. This study gives us a chance to do the same.

According to the literature, insurers utilize hedging mechanisms to optimize value. Furthermore, some of the instruments that are used to keep money from being too easy to get and to keep assets, interest rate risks, and currency exchange rates in check are called "anti-liquidity instruments." (Cummins, Phillips, and Smith, 2001). According to Stulz (1996), if risk management

theory is appropriately used, financial organizations will be protected against market shocks, insolvency, and financial difficulty. Financial managers who follow the fundamentals of risk management may, to the best of their abilities, increase the value of their company ventures via their productive efforts. As a result, financial institutions can take steps to manage risk so that they can better deal with risk fluctuations that are bad for them. Researchers have also said that insurance companies can improve their financial performance by using a framework-based strategy and incorporating corporate governance into their decision-making. This would make sure that every risk is known, understood and dealt with in a timely manner.

#### **1.2.4 Contingency Theory**

Contingency theory is a behavioral theory that claims there is no "one perfect approach" for leading an organization, organizing a team, or making decisions, and these acts are influenced by both internal and external circumstances. Context theory says there is no single way to deal with contingencies, that one thing is dependent on another, and that for business to be successful, there needs to be a "goodness of fit" between organizational structure and outside circumstances. The optimal management plan is determined by the company's conditions (Daft, 2001).

The organizational theorist says, "The optimum approach to organizing relies on the environment in which the organization is related." Contingency theory is based on two main presumptions: first, that there is no one-size-fits-all way to organize; and second, that any way is useless (Galbraith, 1973).

The study is based on the notion of contingency theory, which states that the design and implementation of the chosen performance measurement system (PMS) must be in accordance with its contextual circumstances. Contingency theory is a complex mix of organizational theories, including viewpoints on organizational decision-making and organizational structure (Pugh, Hickson, Hinnings, and Turner, 1969; Donaldson, 2001). The contingency theory paradigm says that the best way for an organization to be successful is to match its characteristics (like its culture) to the things that happen in its environment (Burns and Stalker, 1961; Lawrence and Lorsch, 1967).

Organizations strive to achieve a match of organizational traits to circumstances that leads to excellent performance, according to Donaldson (2001). As a result, the organization is formed around the contingencies (fit) in order to minimize performance loss (Donaldson, 2006). As a

result, an organization and its contingencies are aligned, resulting in a link between contingencies and organizational contextual traits (Burn et al., 1961). The Contingency theory is a valuable tool for visualizing the link between specific contingency variables and organizational structure in order to obtain exceptional results. This idea was applied to the research because a company's organizational performance is dependent on its “financial performance.” “The researcher will use ROA and ROE as a measurement for the insurance companies’ financial performance.”

**Table 1-1: Theoretical summary**

Theoretical	Factor Explaining CPF	Context of Cambodian Insurers	Sources
1. Agency Theory	- The internal factors in insurance companies have a big impact on how well the company runs and how well it makes money.	- The internal factor impact on the financial performance.	- Stephen Ross and Barry Mitnick (1973) - Jensen and Meckling, (1976)
2. Dynamic Capability Theory	- The external environment causes a difference in the dynamic capabilities of the organizations. The advantage in terms of their internal capabilities is more likely to perform well. The performance is determined mainly by how well insurance companies can acquire, align, and integrate their capabilities to gain a competitive advantage.	- The external factors are influencing on the financial performance	- Teece and Pisano (1994) - Grant (1996) - Hansen (1999) - Malmi, and Granlund, (2005)
3. Risk Management Theory	- Effective risk management may benefit all companies, large or small, public, or private, in a variety of ways	- Underwriting risk and Liquidity risk are negative impact on the financial performance.	- Wenk, 2005 - Phuenngam et al. (2009) - Cummins et al. (2001), Stulz (1996)
4. Contingency Theory	- Organizational structure and certain contingency factors must work together to achieve exceptional result.	- The performance measurement system design and use must conform to its contextual factors	- Burns and Stalker (1961) - Daft (2001) - Pugh, Hickson, Hinnings and

- Internal and external factors influence (depend on) the activities.

Turner, (1969),  
Donaldson (2001)

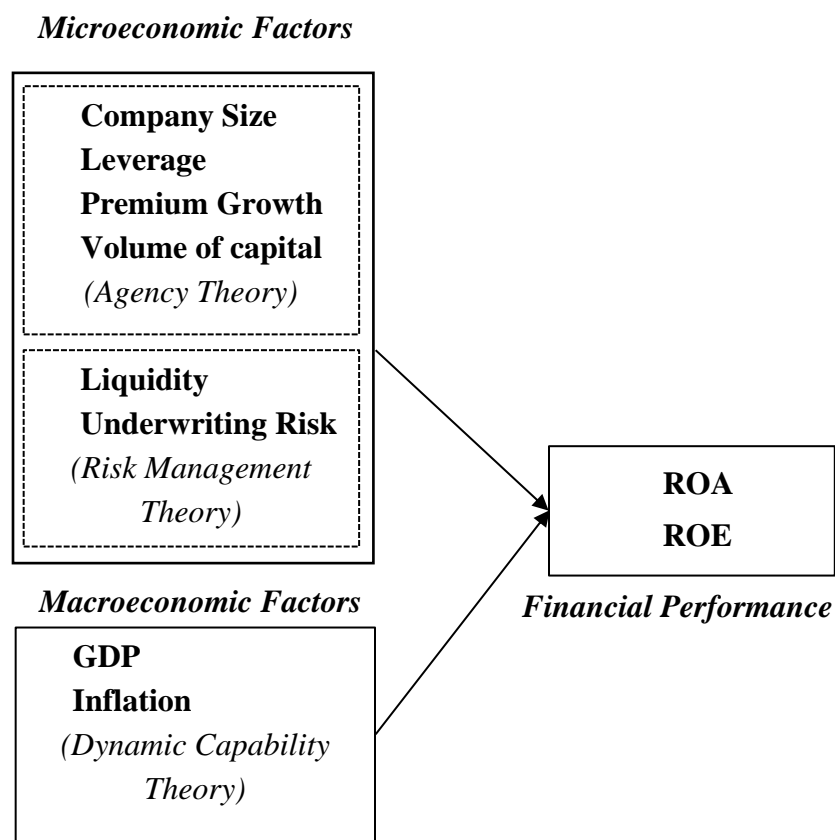
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This section presented the related theories of this research, which include agency theory, dynamic capability theory, risk management theory, and contingency theory. The internal factors of financial performance demonstrated by agency theory are a subset of microeconomic factors. Besides that, the researcher has presented a related theory, such as the Resource-Based View Theory in Appendix C, which demonstrates the full maximization of their available resources to perform financially. Dynamic Capability Theory demonstrates the external factors of financial performance as an aspect of macroeconomic factors. Risk management theory demonstrates the liquidity and underwriting risk of financial performance as microeconomic aspects. Contingency Theory shows that the performance measurement system must be designed and used in a way that fits the context in which it is used. At the same time, the economic growth theory, as presented in Appendix C, demonstrates that the internal factor is accumulation, and the external factor is assistance. As the researcher moves on, they will look at the model from other research in Cambodia and around the world to figure out what factors affect the insurance companies' financial performance.

### **1.3 Conceptual Framework**

A conceptual framework is a graphic that illustrates the relationship between various factors in a study that are related to one another. It aids in the unambiguous identification of the variables used in the research process (Teklit and Jasmindeep, 2017). Insurance companies' financial success is influenced by both external and internal variables. Internal factors are concerned with the individual characteristics or the microeconomic aspect, whilst external factors are concerned with macroeconomic aspects. "Macro and microeconomic factors that determine the financial performance of insurance companies, such as company size, leverage, premium growth, volume of capital, liquidity, underwriting risk, GDP, and inflation were employed in this research." The research investigated how these factors influence insurance companies' financial performance in Cambodia. The conceptual framework used in this research is depicted in Figure 1-6.

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**Figure 1-6: The proposed conceptual framework for factors of financial performance of insurance companies in rapidly growing economies**

#### **1.4 Determinants of the Financial Performance of Insurance Companies in Cambodia: Empirical Evidence**

Many studies on “the financial performance of insurance companies” have been conducted in industrialized countries. The problem receives minimal attention in emerging countries in Asia, Latin America, and Africa. Little research has been done on the subject in our country. It is helpful to know what factors have been included in past studies of different people all over the world, including Cambodia, to conduct this research.

Financial ratios are used to highlight distinct aspects of financial performance in financial statements. Some of the greatest indicators of a company's financial performance are its ROA, ROE, and EPS. ROA is commonly used by financial analysts to assess insurance companies' financial performance. An increase in the ROA ratio shows that a company's financial performance has improved, and vice versa (Epps et al. 2008).

Shiu (2004) looked at the factors that influenced the performance of UK general insurance companies from 1986 to 1999. The author chose 211 firms, each with a particular set of firm-specific and economic factors. They used a two-panel data model and a least squares regression model to figure out the results. He said that insurance performance was correlated to interest rates, return on investment, liquidity, and solvency margins, among other factors. Performance had a negative correlation with inflation and reinsurance. Risk is another key component that has a positive or negative impact on an insurance company's performance. When the company experienced poor underwriting results and low interest earnings, the whole insurance industry suffered. The investment profits would be impacted if the interest earned were low.

In 2008, Elango, Luenma, and Pope looked at the relationship between diversity and company performance in the US property-liability insurance sector. They chose data from the years 1994 to 2002. Profitability is used to evaluate a company's performance. They employ two key profitability indicators: ROA and ROE. They estimated the standard deviation for 14 other variables. They used split-sample analysis and market-measure analysis, among other tests. They claimed that the relationship between company success and product diversification was non-linear. However, if we focus on regional diversification and product integration, however, they think that the return on investment of a company and the diversity profile of an insurance company are linked in a very complicated way. Geographic diversification impacted the firm's performance and product diversification. If there was a modest amount of regional and product variety, the firm's performance would be outstanding.

The study "Determinants of Insurance Company Profitability in Pakistan" was done by Hifza (2011). The researchers' major goal was to figure out the firm's specific profitability based on firm-specific parameters such as size, age, capital volume, leverage, and loss ratio. Some 35 public non-life and life insurance companies were used as a secondary panel by the researchers over a three-year period from 2005 to 2009. Finally, people who have a lot of money and a big company are more likely to be profitable. People who have a lot of debt and a high loss ratio are less likely to be profitable. The company's age has little bearing on its profitability.

Kozak (2011) performed the study under the topic "Determinants of Insurance Company Profitability in Poland." Secondary panel data from 25 Polish insurance companies was used in the study. It took place over a nine-year period from 2002 to 2009 and came from 25 different insurance

companies. According to regression model results, “explanatory variables like gross written premium growth, GDP, operating cost reduction, reinsurance utilization, and growth in the market share of businesses with overseas investment have positive and significant relationships with insurance company performance, whereas provision levels have a negative and significant effect on insurance company profitability.” As the researcher said, most insurance companies in Poland use leverage and reinsurance to keep their income stable and improve their ability to sell insurance.

From 2009 to 2011, Charumathi (2012) conducted a study on insurance companies in India under the title "Determinants of Profitability of Life Insurance Companies in India." The study looked at time-series data from 23 Indian life insurance companies that were active at the time. It used ROA as a dependent variable and leverage, size, premium growth, liquidity, underwriting risk, and equity capital as explanatory variables. Finally, the findings show that the profitability of life insurers is influenced by their liquidity and size in a positive and significant way. Premium growth, leverage, and equity capital have all had a negative and severe impact on Indian life insurers' profitability. The analysis finds little evidence of a substantial correlation between profitability and underwriting risk.

Almajali and Yahya (2012) investigated the elements that have the greatest impact on the financial performance of Jordanian insurance businesses. “Several fundamental statistical procedures, such as the T-test and multiple regression, were used to analyze the time-series data that was collected from all the insurance firms. He looked at all 25 insurance businesses that were listed between 2002 and 2007 on the Amman Stock Exchange. According to the regression results, the explanatory variables liquidity, size, management competency index, and leverage have a positive and substantial impact on the financial performance of Jordanian insurance businesses. Finally, the researcher suggested that growing a company's assets will cause improved financial performance, so executives should think about it. It is very important that the top management team has people with a lot of skills and knowledge.

Burca and Batrinca (2014) published a study titled “Determinants of Financial Performance of Romanian Insurance Companies.” “The research’s goal had to be to figure out the factors that influenced the financial performance of Romanian life insurance businesses from 2008 to 2012.” The research was carried out using panel data methodologies. According to the study’s regression results, “risk-retention ratio, company size, and solvency margin have positive and significant

relationships with performance, while financial leverage, underwriting, growth of gross written premiums, and risk have a negative and significant relationship with financial performance, according to the study's regression results.”

Lee (2014) used “panel data for eleven years from 1999 to 2009 to analyze the link between firm-specific characteristics and macroeconomics on profitability in the Taiwanese property-liability insurance business.” The operational ratio and ROI were used to determine profitability in the study. Utilization of reinsurance, risk of underwriting, cost of input, the financial holding group, and ROI all have a substantial impact on economic viability in both the ROA and the operating ratio models. When the insurance of the financial holding company subsidiaries was compared to other insurance businesses, they showed less profitability. In the operational ratio model, the rate of economic growth has a big effect on profitability. In the ROA model, it doesn't have much of an effect.

Ngwili (2014) conducted research on “Kenyan life insurance companies and found that there is a positive and significant association between liquidity and profitability, as assessed by ROA.” The report also suggested that managers invest more in liquid assets based on the findings. However, Dey, Adhikari, and Bardhan (2015) did research and found that there was a positive and significant relationship between the size of an insurance company and its profitability, as measured by ROE. “However, the study showed that there was a negative relationship between profitability, leverage, and capital.”

Mirie and Jane (2015) conducted research on "Determinates of Financial Performance in General Insurance Companies in Kenya." The research's major goal had to be to “be determinant of the relationship between premium growth, insurer size, retention ratio, earning assets, investment yield, loss ratio, and expense ratio, as well as the financial performance of general insurance underwriters in Kenya.” Multiple linear regression analysis of three-year data from 2010 to 2012 was used in the study. According to the study's results, “financial performance has been positively associated with leverage, equity capital, and the management competence index, but adversely associated with the loss ratio and the expense ratio.” Premium growth, underwriting, size, and retention ratio all have little bearing on financial performance.

Kazeem (2015) used panel secondary data to study “the effect of firm-specific factors on the financial performance of listed insurance firms in Nigeria,” focusing on twelve listed insurance firms over eight years, from 2006 to 2013. ROA was used as a proxy for financial performance,

with secondary data derived from the audited financial statements of the organizations evaluated using the multiple regression statistical technique. Multiple regressions show that the most important predictors of financial performance in the Nigerian insurance market are firm liquidity, size, loss ratio, and leverage. As a result, business size, loss ratio, and leverage all have a negative relationship. The liquidity ratio is linked to financial performance in a favorable and significant way. Finally, the financial performance of listed insurance firms in Nigeria has not been affected by an insurance company's age or premium increase.

For five years, Boyjoo and Ramesh (2017) investigated the factors that influenced the performance of general insurance businesses in Mauritius from 2011 to 2015. “The ROA was used as the dependent variable to evaluate the performance of general insurers in this study.” To assess the panel of secondary data gained for the study's aim, OLS multiple regression is used. The study's findings show that a company's size, leverage, liquidity, underwriting risk, concentration ratio, and investment performance all have a positive and significant impact on the firm's profitability as measured by ROA. Reinsurance reliance and growth rate have a negative and minor impact on ROA. The net operating expense, sales profitability ratio, company age, and premium growth all have a positive effect on the financial performance of general insurance companies in Mauritius..

Batool and Sahi (2019) investigated the factors that influenced insurance businesses' financial performance in the United States and the United Kingdom during the Global Financial Crisis (2007–2016). The researcher contrasted two insurance industries, investigated possible financial performance drivers during the global financial crisis, collected quarterly data from 24 insurance businesses from 2007 to 2016, and used panel data methodologies. Explanatory variables include internal (firm size, liquidity, leverage, and asset turnover) and external (GDP, CPI (Cost per Impression), interest rate, and WTI (West Texas Intermediate). ROA and ROE are the dependent variables (profitability indicators). The size of a firm, liquidity, leverage, asset turnover, GDP, and WTI all have positive effects in the United States, but CPI and interest rates have substantial negative effects. Firm size, liquidity, GDP, CPI, and WTI are all positive in the United Kingdom, but leverage, asset turnover, and interest rates are all negative.

Hussanie and Joo (2019) investigated the influence of microeconomic factors on the life insurance companies' profitability in India. In this study, liquidity, loss ratio, investment, operating

margin, and tangibility all played a role in the life insurance companies' profitability. Leverage and scale didn't have much of an effect on the profitability of the companies.

Abdeljawad and Dwaikat (2019) found that a company's age and company size have a positive significant link with profitability, as measured by the ROA and ROE of profitability of life insurance firms. There was also no link between the company's profitability and items like cash flow, leverage, or costs.

Almajali and Shamsuddin (2019) study the impact of a capital structure on the insurance companies' profitability in Jordan. The link between short-term and long-term debt and ROE is positive. Their study also discovered a correlation between a company's leverage and profitability.

Poudel (2019) discovered that the relationship between liquidity and ROA is negative, and that the ROA's relationship with company size, company age, and leverage is positive. The study also found a relationship between liquidity and ROE is negative, as well as a relationship with company size, age, leverage, and tangibility is positive. According to the regression analysis that was done in this study, the size of an insurance company was a big factor in how well it did.

Zewudu and Meher (2020) looked into the financial health of insurance companies in Ethiopia, taking into account both internal and global issues. This study uses data from a balanced panel of nine insurance companies over a 15-year period (2002–2016) to make inferences. In the explanatory analysis, Pearson's correlation and the OLS regression model are used to look at the relationship between the independent and dependent variables in the study. GDP per capita and company size have a significant positive effect on ROA, while leverage, liquidity, and underwriting risk have a negative effect. The construction of more branches and the enhancement of people's living situations increase financial performance as assets grow. Insurance companies can improve their financial performance by reducing underwriting risk by moving surplus risk to reinsurance, keeping the capital structure so that it doesn't depend too much on borrowed money, and using premiums made from return-harvesting activities.

Lalo (2020) undertook a study to investigate the drivers of insurance businesses' financial performance in Ethiopia as evaluated by ROA. The independent variables leverage, liquidity, management competency index, investment ratio, firm size, market share, inflation, and GDP growth, as well as the dependent variable ROA, were studied using an explanatory research design and a quantitative research technique. All insurance companies operating in Ethiopia were

included in the analysis, which employed secondary panel data from 2014 to 2018. The financial performance of insurance companies was studied using descriptive statistics, correlation analysis, and OLS regression analysis. According to the regression results, the managerial competency index, the investment ratio, GDP growth, and market share all have a positive and significant impact on the financial performance proxy of ROA. ROA has a negative and considerable impact on the size of a corporation. The profitability of an insurance company is helped by liquidity and inflation. Leverage, on the other hand, hurts it, but not very much.

ROA was chosen as a proxy for financial performance as a dependent variable in the study. The use of ROA as the dependent variable has been confirmed in several studies. ROA is part of a managerial performance to produce a profit from the utilization of assets kept in the business, according to Athanasoglou, Brissimis, and Delis (2005). The general insurer operates as an underwriter whose financial success is influenced by the amount of money invested and the size of the assets that yield a return. Chen et al. (2004) examined the elements that influenced financial performance (ROA) in Romania from 2008 to 2012 and found that size had a favorable relationship with financial performance. A massive premium increase entails a significant level of underwriting risk, requiring the maintenance of adequate technical reserves. Khrawish (2011), Martani and Munaiseche (2010), and Ali, Akhtar, Ahmed, and Hafiz (2011) all used ROA and ROE as ways to measure the financial performance of a company.

This section presented the empirical evidence from previous researchers in Cambodia and around the world in order to determine the factors that influence the financial performance of insurance companies. To continue, the researcher will present the hypothesis development, which includes the conceptual framework and the variables that affect or are related to the financial performance of insurance companies. The researcher will also show the variables that affect or are related to the financial performance of insurance companies.

## **1.5 Hypothesis Development**

This researcher presented the variables that they thought could help them create a conceptual framework.

### **1.5.1 Variables**

Microeconomic and macroeconomic factors are expected to be studied as variables. Based on the theoretical review and the empirical review, the researcher will come up with hypotheses about the study.

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### **1.5.1.1. Definition Variable**

The variables must be described in any quantitative research to make it apparent to readers which groups of variables are getting the experimental treatment and what outcomes are being measured (Creswell, 2009). The study does not cover all aspects of the elements that affect an insurance company's financial success, such as external, industry, and internal issues, and instead focuses on the following variables: So, one important thing to keep in mind is that the researcher doesn't do anything different with the above measurement methods or the following definitions. Instead, they copy and expand on the measurement methods and definitions that have been used by other researchers on the same topic.

### **1.5.1.2. Financial Performance Variable**

All have used ROA and ROE as financial performance measurements, according to Khrawish (2011), Martani et al. (2010), and Ali et al. (2011). ROA and ROE are used as financial performance measurements in this study's financial analysis.

#### **i. Return On Assets Variable**

The most frequent metric for determining the determinants of bank and insurance company financial success is ROA. The ROA is defined as the net profit after taxes divided by the total assets. According to Chen et al. (2004), insurance businesses' financial success is often measured in net premium earned, profitability from ROA, underwriting operations, annual turnover, ROI, and ROE. Mehari and Aemiro (2013) say that the ROA is the most important single statistic for judging how profitable, efficient, and well-run an insurance company is because it shows how much money they make from the assets they use.

ROA is part of a managerial performance to produce a profit from the utilization of assets kept in the business, according to Athanasoglou et al. (2005). The insurer acts as an underwriter, and how much money it invests in assets that make money, along with how much money it makes, affects how well the insurer does financially. Chen et al. (2004) looked at the elements that influenced financial performance (return on total assets ratio) in Romania from 2008 to 2012 and found that size had a favorable relationship with financial performance. A huge premium increase comes with a lot of underwriting risk, so it's important to keep enough technical reserves.

According to most academics who studied insurance business efficiency, profitability, and performance, ROA was the key determinant of a firm's financial performance. ROA is a better indicator of financial performance than other ratios since it shows how much profit a company makes on its assets (Malik, 2011). The researcher uses ROA to assess a company's performance and profitability. Malik (2011), Kozak (2011), Lee (2012), Lee and Lee (2012), Mehari et al. (2013), Burca et al. (2014), Mwangi and Murigu (2015), Hadush (2015), Datu (2016), and Mazviona, Dube, and Sakahuhwa (2017). Martani et al. (2010), Khrawish (2011), and Ali et al. (2011) all used ROA and ROE as ways to measure how well a company did financially.

## **ii. Return On Equity Variable**

ROE assesses the profit of companies by demonstrating how much profitability they earn from the invested funds of shareholders. According to Bigdeli and Bidgolo (2006), the best standards to gauge management's success or failure in attaining the aim are ROE and ROA. These numbers show that the ROE is based on how much money shareholders put into the business.

The study by Bhattarai (2020) investigated the elements that determine insurance company profitability in Nepal. Profitability (ROE) is the dependent variable, while expense ratio, leverage, and size are independent factors. The regression analysis showed that the size and leverage of a company had a big impact on profitability. In Nepal, this study showed that financial leverage and company size were the most effective predictors for the insurance company's profitability.

In many emerging markets, the study found a favorable association between ROE and yearly returns, specifically ROE, while ROA has a negative impact (Abor, 2005). Both measurements of profitability, ROE and ROA, are separate performance indicators, according to Loi and Khan (2012). ROA measures how efficiently a company uses its resources. Because of the liquidity debt, the ROA rises. When debt is considered, nonetheless, the ROE of a similar company doesn't change in the same way.

### **1.5.1.3. Microeconomic**

In this study, the variables for the microeconomic factors are the size of the company, leverage, the growth rate of premiums, the amount of capital, liquidity, and the risk of underwriting.

#### **i. Relationship between financial performance and company size**

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The research shows that large insurance businesses have greater performance and profitability than small companies. Large insurance firms, on average, have a stronger capacity to deal with adverse market and economic upheaval than small insurance companies. Compared to small insurance companies, they can more readily hire workers with professional experience, and they benefit from economies of scale in terms of labor expenses, which is the most significant major input for providing insurance services (Shiu, 2004). However, until it achieves maturity, the size of its growth should be regulated to a specific stage. Following this stage, the firm's performance can be determined depending on management's ability. So, up to a certain point, increasing the size of a business gives it the above benefits.

According to Hardwick (1997), large insurers are more likely to outperform small insurers because they can achieve operating cost reductions by expanding output and lowering the unit cost of product and process development. Because large companies have more resources, better risk diversification, and better expense management, there should be a positive relationship between their size and their financial performance. Similarly, Swiss Re (2008) found that large firms expand faster than small firms, and younger firms grow faster than older firms in their research on the association between firm characteristics such as size, age, profitability, and growth. Because of this, most insurance researchers have found a positive relationship between size and profit.

Aside from that, Sommer (1996) and Demircuc-Kunt and Maksimovic (1998) have found a link between company size and profitability. Similarly, Papadogonas, Asimakopoulos, and Samitas (2009) discovered that company size, sales growth, and investment all have a beneficial impact on profitability. Many studies have been conducted separately on the relationship between company size and profitability or performance, but the evidence shows mixed findings, such as Malik (2011), Abate (2012), Mehari et al. (2013), Burca et al. (2014), Hadush (2015), Suheyli (2015), and Boyjoo et al. (2017), that financial performance/profitability is likely positively influenced by size. Cummins and Nini (2002), Lee (2012), Olaosebikan (2012), Derbali (2014), Kazeem (2015), and Mwangi et al. (2015), Hanna (2015), Asrat and Tesfahun (2016), and Mazviona et al. (2017) found that firm size is not statistically significant and has no direct effect on performance or profitability.

*H1: Company size has a positive influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

## ii. **Relationship between financial performance and leverage**

Leverage has long been seen as a key factor in predicting corporate performance. It is regarded as a significant aspect in determining an insurance company's financial performance. Leverage is the degree to which a company uses debt funds. Financing with debt funds can improve a shareholder's ROI by allowing them to take advantage of tax benefits linked to the borrowed cash. Similarly, more profitable enterprises are driven toward greater leverage as expected by "the trade-off theory," which claims a positive association between company performance and leverage ratio and is backed by taxes, agency charges, and bankruptcy costs. As a result, more profitable companies should opt for debt financing to take advantage of the tax break (Abate, 2012). As a result, insurance businesses may profit by assuming appropriate leverage risks, or they may go bankrupt if the risks get out of hand (Daniel and Tilahun, 2013). Adams et al. (2000) say that insurance companies with high leverage are better at running their business than insurance companies with low leverage.

The ability of an insurer and reinsurer to control their economic exposure to unexpected losses is measured by their financial leverage (Adams et al. 2003). Low leverage is a measure of a company's financial soundness, and it ostensibly minimizes the need for management to boost investment earnings, such as to build reserves. Leverage ratios can also be used to assess a company's long-term viability. To increase the company's leverage, it should purchase more insurance policies, reinsurance policies, and borrow money. Empirical research has shown that there are both positive and negative statistically significant relationships between leverage and profitability. Kakani, Saha, and Reddy (2001), Bashir (2000), Neri (2001), and Adams et al. (2000) all say that leverage has a significant effect on how well a company does financially.

In contrast to the preceding, Ahmed, Ahmed, and Usman (2011) believe that if a company is heavily leveraged, it may face bankruptcy if it cannot make timely loan payments and it may also be difficult to get new lenders in the future. According to Chen et al. (2004), leverage above the optimum level might cause increased risk and poorer company value. Similarly, an insurer's risk may rise when it increases its debt. The literature on capital structures confirms that when leverage increases, a firm's value increases up to an optimum point and then declines if leverage is increased beyond that point (Abate, 2012). Previous research has found a link between financial leverage and business performance that is both favorable and significant. According to Daniel et

al. (2013), leverage is considerably and favorably related to the financial success of insurance firms. Browne Carson and Hoyt (2001), Ahmed et al. (2011), Sumaira and Amjad (2013), and Abate and Yuvaraj (2013) all discovered leverage has a negative relationship with insurance companies' financial performance. Ali-Shami (2008) in the United Arab Emirates, Malik (2011) in Pakistan, Swiss Re (2008) in Egypt, and McDonald, Liliana, and Flaminin (2009) in Sub-Saharan Africa all found that leverage has a negative but statistically significant relationship with companies' profits.

*H2: Leverage has a positive influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

### **iii. Relationship between financial performance and premium growth**

The premium increase has been noted in relevant research as another major financial component that determines insurance businesses' financial performance. As a result, it has been asserted that the firm's premium growth impacts the financial performance of insurance companies, and this has been extensively examined. Premium growth is calculated as a percentage change in total assets or, in some situations, as a percentage change in premiums paid by insurance companies (Abate, 2012). The rate of market penetration is measured by the growth rate (Ahmed et al. 2011). According to Chen et al. (2004), being too focused on premium growth can lead to self-destruction because other vital goals, such as selecting a lucrative portfolio to invest in, may be overlooked. Empirical investigations produced a variety of results. According to some studies, premium increases have a positive and significant impact on insurance companies' performance (Akotey and Gemegah, 2011), (Ahmed et al. 2011), (Abate, 2012), and (Sambasivam and Ayele, 2013). They said that raising premiums makes insurers' core activities and overall performance more profitable.

According to Charumathi (2012), premium growth and business performance have an inverse relationship. Akotey et al. (2011) explain why there is a negative association between premium growth rate and financial performance. The first is that most insurance firms place an undue focus on different marketing campaigns to generate more premiums at the expense of their investment operations, according to them. Investment income will drop despite a rise in net written premiums if more resources, notably human and capital, are allocated to underwriting more policies to boost premiums rather than a commensurate concentration of such resources on asset

and liability management. They said that many of the premiums paid are past due, which might cause bad debt. In their study, Sumaira et al. (2013) discovered a positive but negligible association between premium increases and insurance companies' financial performance. Daniel et al. (2013) found a small but positive relationship between premium growth and the financial performance of insurance firms in Ethiopia.

*H3: Premium Growth Rate has a positive influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

**iv. Relationship between financial performance and volume of capital**

The amount of capital held by an insurer is regarded as a significant indicator of its financial soundness, and prudential norms emphasize the necessity of proper capitalization, with solvency as a primary focus of insurance oversight. Capital is viewed as a safety net that protects the insured while also promoting the financial system's stability and efficiency. It also shows whether the insurance business has sufficient money to absorb claim losses. The difference between total assets and total liabilities is used to calculate the volume of capital in most insurance studies, while the ratio of equity capital to total assets is used in some circumstances.

Because it represents the firm's financial strength, the volume of capital is commonly used as one factor of insurance companies' profitability. Given that a bigger flow of stock produces stronger financial stability and the opportunity to develop the business, a positive relationship between the volume of capital and insurers' financial success is expected (Anthanasoglous, Brissimis, and Delis, 2005). Malik (2011) investigated the link between capital volume and ROA in the Pakistani insurance sector and established a positive, statistically significant association between the volume of capital and profitability. In the United Arab Emirates, Ali-Shami (2008) did a similar study and discovered a positive, significant relationship between the volume of capital and profitability.

*H4: Volume of capital has a positive influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

**v. Relationship between financial performance and liquidity**

Liquidity refers to an insurance or reinsurance company's capacity to meet its immediate obligations to policyholders and other creditors without having to raise earnings through underwriting and investment activities or liquidate financial assets (Adams et al. 2003). In terms

of liquidity, empirical research shows a lot of inconsistency. According to Chen et al. (2004), liquidity has a considerable statistical impact on insurance businesses' financial success. Adams et al. (2000) discovered a negative link between liquidity and profitability. According to Hakim and Neaime (2005), liquidity and investment are major predictors of a bank's profitability, which also applies to insurance.

According to Chen et al. (2004), the firm's liquidity is a critical factor that influences its performance. Liquidity is defined as the ratio of current assets to current liabilities in its broadest definition. In other words, "liquidity" refers to an assessment of an organization's ability to satisfy present obligations as they become due. Liquidity in insurance firms refers to the likelihood of the company paying its debt, which includes operating expenses and payments for losses and benefits under insurance policies. It shows the firm's ability to convert an asset into cash quickly, as well as its ability to manage working capital when held at a typical level. Almajali et al. (2012) say that a company might use liquid assets to pay for its operations and investments when it can't get financing from outside sources or when it costs too much to do so.

According to Liargovas et al. (2008), higher liquidity would help a corporation deal with unanticipated events and meet its obligations during a period of low earnings. According to Daniel et al. (2013), organizations with more liquid assets are less likely to collapse since they can realize cash even in the most challenging of circumstances. As a result, insurance companies with more liquid assets are projected to outperform those with less liquid assets. However, increasing asset liquidity may increase agency costs for owners according to the notion of agency costs, because managers may take advantage of the benefits of liquid assets (Adams et al. 2000). In terms of liquidity, empirical research shows conflicting results.

According to Ahmed et al. (2011), liquidity has a statistically insignificant relationship with ROA. The research has investigated the relationship between liquidity and the financial performance of insurance companies. Sumaira et al. (2013) and Daniel et al. (2013) conducted recent studies that found no significant association between insurance company liquidity and financial success. According to Browne et al. (2001) and Almajali et al. (2012) studies, liquidity is favorably and highly associated with the financial performance of insurance firms. Abate (2012) and Abate et al. (2013) found a significant negative relationship between the liquidity of an insurance company and how well it does its job.

*H5: Liquidity has a negative influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

#### **vi. Relationship between financial performance and underwriting risk**

Their underwriting efficiency is shown by “their loss ratio,” which is the ratio of gross claims to gross written premium. This ratio is based on how much risk the insurers take when they sell insurance. The adequacy, or lack thereof, of insurers' underwriting performance is reflected in underwriting risk (Adams et al. 2003). The loss rate is used to measure the productivity of the underwriting activity and the underwriting risk (Adams et al. 2000).

Burca et al. (2014) define underwriting risk as the ratio of the claim incurred to the net premium earned, and it is quantified by the ratio of the claim incurred to the net premium generated. It emphasized the efficiency with which insurance companies conduct their underwriting operations. The financial performance of insurance depends on sound underwriting rules. The risk appetite of life insurers determines the underwriting risk. Lee et al. (2012), Lee (2012), and Burca et al. (2014) all use the ratio of net losses to net premiums to figure out the risk of underwriting.

For instance, Fama et al. (1983) argue that companies that take part in hazardous activities are more likely to have variable cash flows than companies with risk-averse management. The firm's financial performance may improve because of the decreased expected underwriting losses. As a result, understanding the fundamental drivers of underwriting risk aids insurers in maintaining a low cost of claim management (Lee et al. 2012). According to Malik (2011), Lee et al. (2012), Mehari et al. (2013), Burca et al. (2014), Suheyli (2015), Daare (2016), Datu (2016), Asrat et al. (2016), and Teklit et al. (2017), underwriting risk has a negative relationship with insurance companies' profitability and performance. In this study, the researchers predict that the underwriting risk will have a negative relationship with the ROA of insurance companies' financial performance.

*H6: Underwriting risk has a negative influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

#### **1.5.1.4 Macroeconomic**

It has been observed that as a country's economy grows, insurers cover more people and buildings as a safety net. Insurance company profits are influenced by a variety of macroeconomic

indices of economic growth. Beck and Webb (2003) found that, compared to macroeconomic factors, economic growth is good for the profits of insurance companies.

#### **i. Relationship between financial performance and GDP**

GDP is a macroeconomic metric that measures the total value of goods and services produced in a country over a specific time period, usually a year. Overall business circumstances and, as a result, insurance capacity reflect GDP growth (Hussain, 2015). Economic growth is defined as a rise in the production of economic commodities and services. Poor economic conditions might cause a country's investment to drop. This will affect business performance (Teklit et al. 2017). The investment will increase as GDP rises, and the likelihood of selling insurance policies will rise as well. Insurers are expected to benefit because of this, as they will receive greater gross premiums, resulting in larger profits. Economic growth leads to higher living standards, higher income levels, and an increase in the population's purchasing power (Burca et al. 2014).

The pace of GDP growth, as measured by the real annual GDP growth rate, is projected to have a favorable impact on insurance profitability. Economic growth can boost insurance company profits by raising individual income, i.e., GDP per capita income and then household income. Individuals', households', and enterprises' desire for security will rise as their income rises (i.e., the need to be secured against risk with life, businesses, and other properties). People buy insurance policies because they are afraid of danger or uncertainty, and they pay a premium based on whether they want life, non-life, or health insurance. As a result, premium hikes will boost insurance firms' profits if claims are paid in typical circumstances. When the economy is weak, however, all of this is reversed (Kozak, 2011). Tadesse (2013) says that an increases in GDP growth is good for the profits of insurance companies.

Bashir (2003) found that favorable macroeconomic conditions have a positive impact on performance metrics. According to Pervan et al. (2012), GDP per capita has a favorable and considerable impact on performance. Except for the inflation rate, Srairi (2009) explored whether all macroeconomic indicators are positively significant in explaining profits. Merin (2012) found that none of the outside factors, including the GDP growth rate, had a big enough effect on the profitability of insurance during the study period.

Several studies have attempted to quantify the impact of economic growth on the profitability of insurance companies. Meaza (2014), Hanna (2015), Mistre (2015), and Teklit et al.

(2017) found that GDP has a positive but insignificant relationship with ROA, which is a proxy for profitability. However, studies conducted by Hadush (2015), Behaylu (2017), and Stephen and Andres (2013) found that GDP has a negative negligible impact on insurance company performance, meaning that as GDP rises, insurance company financial performance declines but does not significantly. In contrast, Suheyli (2015), Kazimierz (2016), Asrat et al. (2016), and Tariku (2019) all found that GDP has a positive effect on business profitability. This means that as GDP goes up, so will insurance companies' profits.

*H7: GDP Growth rate has a positive influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

## **ii. Relationship between financial performance and inflation**

Inflation is defined as an increase in the overall price of goods and services. Inflation is a term used to describe an increase in the overall price level of goods and services in the economy (Hadush, 2015). Expected inflation is considered by actuaries when determining actuarially reasonable premiums, but inflation is unlikely to have a significant impact on insurance companies' performance. If inflation is considerably higher than predicted, insurance companies may face financial difficulties. Unexpected inflation, for example, reduces real yields on fixed-rate bonds. As a result, insurance companies' profit margins are squeezed, and their financial performance suffers as a result (Browne et al. 2001).

Inflation could impact the financial performance of insurance businesses by affecting both "liabilities and assets." In anticipation of inflation, claim payments to consumers increase, as do reserves necessary in anticipation of increased claims, affecting investment and, as a result, lowering technical and financial performance. According to Meaza (2014), Hanna (2015), Asrat et al. (2016), Teklit et al. (2017), Behaylu (2017), and Stephen et al. (2017), inflation has a negative significant association with insurance companies' profitability and financial performance. According to Suheyli (2015), inflation has an indirect and inconsequential association with financial performance.

Hussain (2015) in Pakistan and Datu (2016) in Mississippi found positive correlations between inflation and profitability, implying that a high inflation rate may lead to irrational pricing and, as a result, high levels of earned premiums for insurance, resulting in increased profitability. In contrast,

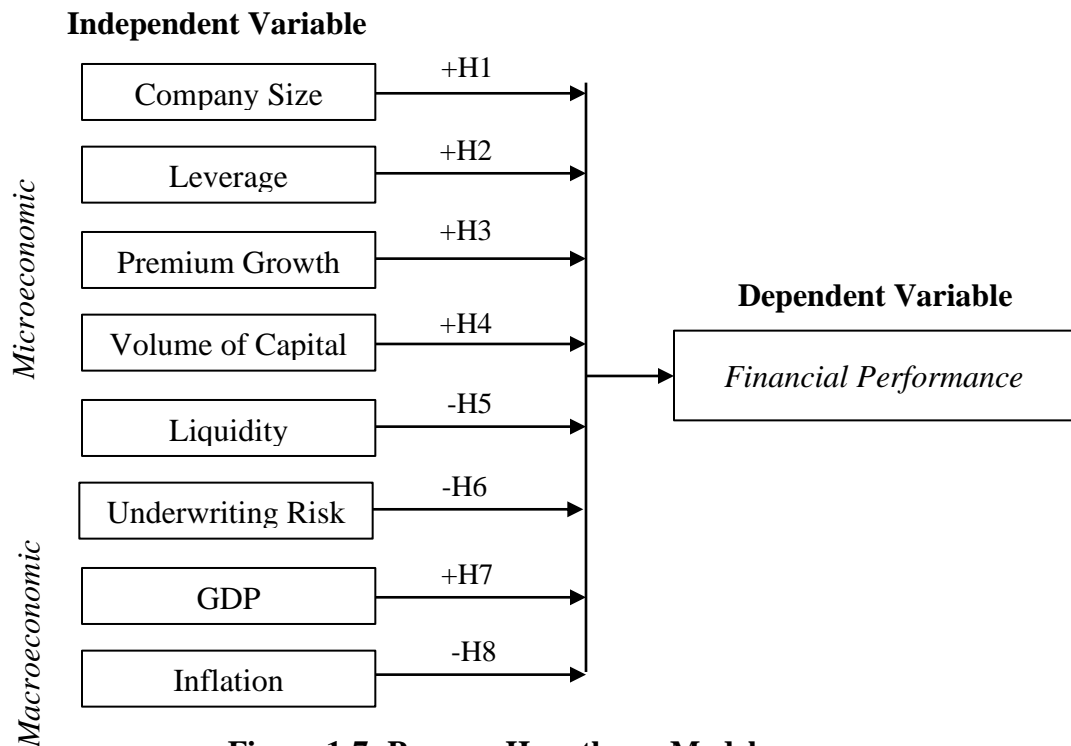
research conducted by Pervan et al. (2012), Lee (2014), Meaza (2014), Suheyli (2015), Hadush (2015), Asrat et al. (2016), and Teklit et al. (2017), found a negative insignificant relationship between profitability and inflation, whereas Jibran (2016) and Demis (2016) found a significant relationship between profitability and inflation, implying that higher inflation leads to higher profitability.

*H8: Inflation has a negative influence on the ROA and ROE of the financial performance of insurance companies in Cambodia.*

This section presented the hypothesis development, which includes the conceptual framework and the variables that influence or are related to the insurance companies' financial performance, as well as the variables that influence or are related to the insurance companies' financial performance. To keep going, the researcher will present the conceptual model that uses the latest theories and real-world evidence.

### 1.6 Conceptual Model

The current research applied the latest theory that has been extended by various researchers, as mentioned in the literature review. Figure 1-7 depicts the model used in this research.



**Figure 1-7: Propose Hypotheses Model**  
**Financial performance of insurance companies in rapidly growing economies in Cambodia**

## **1.7 Summary of the Chapter**

This chapter looks at the research that has been done on financial performance and theorizes about it. Various theoretical and empirical research has been undertaken regarding a variety of corporate organizations and sectors to investigate the variables' effects on financial performance. The literature study revealed considerable agreement on the impact of microeconomic (internal) and macroeconomic (external) factors on insurance companies' financial performance in Cambodia. It also included Agency Theory, Resource-Based View Theory, Dynamic Capability Theory, Risk Management Theory, Contingency Theory, and Economic Growth Theory, among other theories on insurance companies' financial performance. ROA and ROE were the dependent variables, and the independent variables were firm size, leverage, premium growth, volume of capital, liquidity, underwriting, GDP, and inflation.

There has been a slew of empirical research on insurance company financial performance. However, rich and rising nations, particularly the United States of America, have received disproportionate attention in the research. In Cambodia, just a few studies on insurance firms' financial performance have been conducted. As a result, our study is useful in filling up this important knowledge gap. This study is unusual in that it focuses on insurance firms, which are a type of financial institution that handles a large number of transactions. Another chapter will include empirical analysis, which will cover the research technique, study findings, and a test to ensure that the findings aren't a fluke.

## **CHAPTER TWO**

### **EMPIRICAL ANALYSIS**

This chapter describes the research method, research result, and robustness checks to make sure the data and the research result are acceptable and not biased in the way that it could affect the regulator, insurance companies, and the researcher.

#### **2.1. Research Method**

This section explains the research approach that was utilized to acquire data, process the data, and transform the data into useful knowledge. It outlines the stages and techniques of the study that were utilized to determine the insurance firms' financial success. This part covers study design, data type, and source; research procedures; population; data collection instruments; data analysis techniques; variable definitions, including dependent and independent variable selection; and diagnostic analysis.

##### **2.1.1. Research Design**

A research design, according to Kinnear (1989), is a fundamental strategy and technique that directs a research project's data collection and analysis phase. It is the framework that describes the type of data to be collected, as well as where and how it should be collected. This denotes the researcher's approach to data collection, analysis, question answering, and hypothesis testing. It lays out the steps for conducting an investigation from beginning to end. Correlation study design aids in the construction of correlational statistics and the discovery of relationships between dependent and independent variables (Creswell, 2012). The research topic in this study is explanatory in nature, and it aims to explain the link between financial performance and associated causes (Creswell, 2009). As a result, the correlational explanatory research design was used in this study.

In this study, the researchers used a quantitative method to collect data from all insurance companies in Cambodia using panel data from 2009 to 2019. As a secondary source of data, the Ministry of Economy and Finance (MEF) and the Insurance Association of Cambodia (IAC) provide the balance sheets, income statements, and revenue accounts of insurance companies. Secondary data sources are the most trustworthy since these financial statements have already been verified by independent auditors and accepted by the information consumers. The World Bank website provided further macro-level statistics.

### **2.1.2. Research Approach**

This section discusses the research approach employed in this research. According to Creswell (2014), there are three fundamental categories of research methodologies. The first is quantitative research, which is described as the collection of numerical data and the testing of objective ideas via the examination of correlations among variables. Statistical approaches can be used to examine numerical data deductively or inductively. With the objective of inductively creating a hypothesis or pattern, qualitative research is used to examine and grasp the meanings of people or groups as they relate to a society or human context. If information cannot be examined using mathematical approaches, it is classified as qualitative. Finally, the researchers used both quantitative and qualitative data to get a sense of and focus on the study topic.

In this study, the researcher collected the time series panel data from a trusted source and used a quantitative method to analyse this data. This technique was employed to detect and assess the financial performance of insurance companies. The impact of financial performance on insurance companies is measured using multiple regression. Multiple regressions are the best fit for the research because they take into account the relationships between the independent and dependent variables that are seen throughout the regression model.

As a result, in order to meet the research's goal, the study only looks at quantitative data, which was compiled using an econometric model to figure out and measure financial performance and its significance.

### **2.1.3. Data sources and Data Collection Instruments**

The researchers used eleven-year panel secondary data and a financial report received from the IAC and MEF to perform this research. The macroeconomic data for this research came from the World Bank's website. Secondary data is of greater quality than source data, especially when verified by a third party, and longitudinal research may be conducted with it. Secondary data is a source of data that is both permanent and accessible in a format that can be readily examined by others. According to Brooks (2008), panel data can be used to study a wide range of topics and come up with more difficult problems by looking at how variables change over time or how variables connect to one another and how they fit together in a model.

Among different data collection instruments, the researcher collected secondary data by reviewing the annual audited financial reports of Cambodian insurance companies from the years

2009 to 2019. It's important to figure out how financial performance and macroeconomic variables are linked so that macroeconomic data can be found in the records of IAC and the MEF through a structured document review process.

#### **2.1.4. Population**

Populations to be targeted by the research are all registered insurance companies by MEF and are operating in Cambodia. According to the MEF annual report (2019), currently, there are thirteen insurance companies operating in Cambodia. Since several companies are small, this study includes all the insurance companies that operate in Cambodia. Eleven-year panel secondary data from 2009 to 2019 was collected from all insurance companies. Using eleven years of financial panel data is considered essential and is used in most finance literature. In addition, including all insurance companies helps to reduce sampling and other related errors.

#### **2.1.5. Method of Data Analysis**

To achieve the goal of the study, descriptive statistics, Pearson correlation analysis, and multiple linear regression analysis were used to look at the data from the above-mentioned sources of data. On the basis of data from all insurance firms, mean values and standard deviations, as well as “minimum and maximum values,” are used to examine the overall patterns of dependent and independent variables from 2009 to 2019. The “Pearson correlation matrix” may also be used to look at the relationship between the explanatory and dependent components. It is also used to find the most important and influential factors that affect the financial performance of the Cambodian insurance companies using the statistical program "EViews 9."

According to Brooks (2008), panel data is ideal for financial modeling scenarios that include both time series and cross-sectional data. Panel data allows the researcher to deal with a broader variety of themes and tackle more difficult problems than time-series or cross-sectional data alone. As a consequence, the research model relies on panel data, which has both time-series and cross-sectional aspects; the cross-sectional element comprises thirteen Cambodian insurance businesses, while the time-series element covers the study period (2009–2019). As a consequence, the gathered panel data is evaluated in order to determine the independent and dependent variables' correlations. A statistical approach for identifying the relationship between two variables is correlation. Regression analysis is used to figure out how important or predictive an independent variable is to the dependent variables.

## 2.1.6. Definition and Measurement of Study Variables

The researcher gave the following explanations of what the dependent and independent variables are and how to measure them:

### 2.1.6.1. Definition and Measurement of DV

Financial performance relates to a company's profitability, or how much revenue exceeds the cost of generating it. Insurance firms' financial success is typically measured in terms of profitability from underwriting activities, the net premium received from clients, yearly sales turnover, ROA, and ROE. Even though there are many profitability metrics, Rasiah (2010) claims that the profitability ratio chosen is determined by the profitability measure's goal. ROA is essentially a measure of a firm's efficiency, and it shows how lucrative a company is in relation to its total assets (Ahmed, 2008). When evaluating the profitability of two organizations, ROA is a useful metric to use (companies). Unlike the ROE, the ROA cannot be subject to an increase in higher borrowings. The ROA of insurance companies' financial performance was measured using profitability ratios. Among others, Arif et al. (2015), Catherine (2014), and Hifza (2011) have suggested that although there are different ways to measure financial performance, many profitability and financial performance measurements have not imparted impressive performance on the company. It is better to use ROA because it lets you see how your resources (assets) are working together. So, ROA and ROE are important ways to measure an insurance company's financial performance because they are used as dependent variables.

$$ROA = \text{Net Profit after Tax} / \text{Total Assets}$$

$$ROE = \text{Net Profit after Tax} / \text{Total Equities}$$

### 2.1.6.2. Definition and Measurement of IV

From 2009 to 2019, eight variables were tested to find out what affects the financial performance of insurance companies in Cambodia. Company size, leverage, premium growth, volume of capital, liquidity, underwriting risk, GDP, and inflation were some of these.

- i. **Company Size (CS):** The term "company size" refers to the addition of more branches, which results in increased business volume and, as a result, increased asset value. Insurance firm size, gross premiums written, and capital are all linked to financial performance (Almajali et al. 2012; Berry-Stölzle, Liebenberg, Ruhland, and Sommer, 2012). On the other hand, Adams and

Buckle (2013) argue that size has no influence on financial performance. According to Chen et al. (2004), larger enterprises are more profitable due to economies of scale. The natural logarithm of the insurance company's total assets is used to computerize it. Ayele (2012), Lee (2014), Kaya (2015), Hailegebreal (2016), Datu (2016), Kriya and Ajasllari (2016).

$$CS = \text{Log} (\text{Total asset})$$

- ii. **Leverage (LVR):** Even if the company is at risk of defaulting, when an insurance company inducts borrowed cash into the business as a tax shelter, it generates financial leverage. According to Onaolapo and Kajola (2010), the debt ratio has a significant negative impact on the firm's performance measures. ROA and ROE are acronyms for "return on assets" and "return on equity." In a study of Ethiopian insurance companies from 2005 to 2012, Ejigu (2016) discovered that leverage has a negative and substantial relationship with profitability. Meher and Ajibie (2018) determined that debt financing is helpful to a company's profitability, while Meher and Ajibie (2018) argued against it. Omondi and Muturi (2013) analyzed 29 listed enterprises that traded on the Nairobi Securities Exchange between 2006 and 2012 (excluding listed banks and insurance companies). They believed that a low leverage ratio boosted ROA's financial performance. It's also known as leverage or trading on equity, and it refers to borrowing money to buy more assets. Using financial leverage to gain control of a larger number of assets (by borrowing the money) may cause a boost in the owner's cash investment returns. It shows that companies with greater financial leverage are more vulnerable to underinvestment, insolvency risk, and bankruptcy costs. The overall debt-to-equity ratio is used to determine this. This ratio represents the amount of money borrowed by the insurers. It refers to an insurance company's capacity to control its financial exposure to unexpected losses (Adam et al. 2000). Ayele (2012), Almajali et al. (2012), Lee (2014), Kaya (2015), Hailegebreal (2016), Datu (2016), and Asrat et al. (2016).

$$LVR = \text{Total Debt} / \text{Total Stockholders' equity}$$

- iii. **Premium Growth (PGR):** Most insurers' principal source of revenue is premium revenue, which is more consistent than other revenue streams. As a result, premium growth should aid in forecasting revenue and profitability growth in the future. The pace of market

penetration is also measured by premium growth. Premium increases are another indicator of market penetration. The increase in gross written premiums as a proportion of total premiums is a proxy for premium growth. Adams et al. (2003); Epermanis and Harrington (2006); Eling and Schmidt (2008); Cole, He, McCullough, Semykina, and Sommer (2011); Akotye et al. (2011); and Daniel et al. (2013). The formula is as follows:

$$PGR = (GWP (t) - GWP (t-1)) / GWP (t-1)$$

- iv. **Volume of Capital (VOC):** The ratio of an organization's total capital to its total assets is known as the volume of capital. Financial performance is backed by the insurance firm's ability to pour more cash into the insurance firm, which leads to economies of scale by creating additional branches. Hansen (2009).

$$VOC = Total Capital / Total Assets$$

- v. **Liquidity (LIQ):** The capacity to satisfy debt obligations due in the next twelve months with cash or an asset that has been converted to cash is referred to as liquidity. It demonstrates the capacity to convert an asset to cash quickly and displays the firm's ability to manage working capital when retained at typical levels. Shiu (2004), Almaiali et al. (2012), Ayele (2012), Almajali et al. (2012), Omondi et al. (2013), Mwangi et al. (2015), Hailegebreal (2016), and Kripa et al. (2016).

$$LIQ = Current Assets / Current Liabilities$$

- vi. **Underwriting Risk (UWR):** An underwriter assumes the risk of loss. Underwriting risk in insurance can result from an incorrect estimate of the risks connected with creating a policy or from uncontrollable causes. As a result, the insurer's expenses may far outweigh the earned premiums. Increased costs can have a substantial influence on a company's stability and the efficiency of its underwriting activities. Underwriting risk is calculated using the ratio of net incurred claims to net earned premium. Burca et al. (2014); Arif et al. (2015); Hailegebreal (2016); and Datu (2016).

$$UWR = Ratio of Net incurred claim / Net earned Premium$$

- vii. **Gross Domestic Product (GDP):** Each year, the total value of products and services produced in a country is measured. Insurance profitability is expected to increase when the real annual GDP growth rate, which is used to calculate GDP growth, rises. The demand for security for individuals, households, and businesses will increase as their money grows. A few examples are Doumpos et al. (2012), Lee (2014), and Hailegebreal (2016).

$$GDP = (GDP_t - GDP_{t-1}) / GDP_{t-1}$$

- viii. **Inflation (INF):** Inflation is defined as an increase in the overall cost of goods and services in each economy (Hadush, 2015). Inflation, in principle, helps insurance firms succeed financially. The general yearly rising change rates of the consumer price index are used to determine inflation. Some of the studies that have been done include Browne et al. (2001), Doumpos et al. (2012), Lee (2014), Hussain (2015), and Hailegebreal (2016).

$$INF = (INF_t - Inf_{t-1}) / Inf_{t-1}$$

**Table 2-1: Variables measurement**

Variables	Measures	Sources
<i>Financial Performance (Dependent Variables)</i>		
ROA	<i>Net Profit after Tax / Total Assets</i>	Rasiah (2010), Hifza (2011), Lee (2014), Catherine (2014), and Arif et al. (2015).
ROE	<i>Net Profit after Tax / Total Equities</i>	Toit and Wet (2007) and Damodaran (2007).
<i>Microeconomic Factor (Independent Variables)</i>		
Company Size (CS)	<i>Log (Total asset)</i>	Ayele (2012), Almajali et al (2012), Berry-Stölzle et al. (2012), Lee (2014), Kaya (2015), Hailegebreal (2016), Datu (2016), Kripa and Ajasllari, (2016).
Leverage (LEV)	<i>Total Debt/Total Stockholders' equity</i>	Ayele (2012), Almajali et al (2012), Lee (2014), Kaya (2015), Asrat et al. (2016), Hailegebreal (2016), and Datu (2016).

Premium growth (PGR)	$(GWP(t) - GWP(t-1)) / GWP(t-1)$	Adams et al. (2003), Epermanis et al. (2006), Eling et al. (2008), Cole et al. (2011), Akotye et al. (2011), and Daniel et al. (2013).
Volume of capital (VOC)	$Total\ Capital / Total\ Assets$	Hansen (2009).
Liquidity (LIQ)	$Current\ Assets / Current\ Liabilities$	Ayele (2012), Almajali et al (2012), Mwangi et al. (2015), Hailegebreal (2016), and Kripa et al. (2016).
Underwriting risk (UWR)	$Ratio\ of\ Net\ incurred\ claim / Net\ earned\ Premium$	Burca et al. (2014), Arif et al. (2015), Hailegebreal (2016), and Datu (2016).
<b>Macroeconomic Factor (Independent Variables)</b>		
GDP	$(GDP_t - GDP_{t-1}) / GDP_{t-1}$	Doumpos et al. (2012), Lee (2014), Hailegebreal (2016).
Inflation rate (INF)	$(INF_t - Inf_{t-1}) / Inf_{t-1}$	Browne et al. (2001), Doumpos et al. (2012), Lee (2014), Hussain (2015), and Hailegebreal (2016).

### 2.1.7. Empirical Model Specification

Model construction entails defining relationships between dependent and independent variables as well as developing descriptive or predictive equations. Because of the data in this investigation, the researchers were able to utilize an econometric panel data model that encompassed cross-sectional and time-series data methodologies. Panel data is better than pure time-series data and cross-sectional data because it can account for differences between individuals and has less multilinearity across variables (Altai, 2005).

Several of the main features the researchers are talking about have been used by a lot of other researchers at different times, based on theories and data from previous research. Both dependent and independent variables are included in the model. They used ROA and ROE to measure financial performance in Hafiz (2011), Lee et al. (2012), Pervan et al. (2012), Abate (2012), Mehari et al. (2013), Burca et al. (2014), Lee (2014), Suheyli (2015), Demis (2016), and Datu (2016).

Company size, leverage, premium growth rate, the volume of capital, investment ratio, liquidity, underwriting risk, GDP, and inflation rate are the independent variables used. These are some of the sources for this information: Kozak (2011), Lee (2012), Mehari et al. (2013), Meaza (2014), Moro and Anderloni (2014), Burca et al. (2014), Suheyli (2015), Hussain (2015), Demis (2016), Asrat et al. (2016), and Tariku (2019). The baseline regression model used in this study was changed based on the empirical studies in the sources.

There are “fixed effects,” “random effects,” and a “pooled OLS regression model” that can be used to analyze panel data in financial research. Different tests were implemented to decide which model was appropriate for this research. The first test was “the Hausman test,” which was used to choose between fixed-effect and random-effect models. The “Breush and Pagan Lagrange multiplier test” enables us to pick the model from the previous test between “the fixed-effect and random effects regression model and the OLS regression model after selecting the model from the effective and fixed-effect models.” The first test revealed that the p-value was negligible at the 5% threshold of significance, so a random effect was chosen. The Breush and Pagan “Lagrangian multiplier” test was used to compare “the random effect and pooled OLS regression models,” and the findings revealed that pooled OLS was the best match for the research since the P-value was negligible at the 5% level of confidence. As a result, the study's model was defined as follows:

$$ROA_{it} = \alpha + \beta_1 CS_{it} + \beta_2 LEV_{it} + \beta_3 PGR_{it} + \beta_4 VOC_{it} + \beta_5 LIQ_{it} + \beta_6 UWR_{it} + \beta_7 GDP_{it} + \beta_8 INF_{it} + \varepsilon_{it}$$

$$ROE_{it} = \alpha + \beta_1 CS_{it} + \beta_2 LEV_{it} + \beta_3 PGR_{it} + \beta_4 VOC_{it} + \beta_5 LIQ_{it} + \beta_6 UWR_{it} + \beta_7 GDP_{it} + \beta_8 INF_{it} + \varepsilon_{it}$$

Where:

1.  $i$  stands for the  $i^{\text{th}}$  cross-sectional unit and  $t$  for the  $t^{\text{th}}$  period,
2.  $\alpha$  is the intercept for each entity
3.  $Y_{it}$  represents dependent variable ( $ROA_{it}$  and  $ROE_{it}$ )
4.  $X_{it}$  represents independent variable (CS, LEV, PGR, VOC, LIQ, UWR, GDP, INF)
5.  $\beta_{1-8}$  are the coefficients for the independent variable, and
6.  $\varepsilon_{it}$  is the error term

#### **i. Fixed effect model**

Individual attributes do not change over time in the fixed effect model, and they can be associated with dependent variables. The fixed effect model treats constants as a single group, with

separate variables for each group inside the group. The Least Square Dummy Variable (LSDV) estimator is another name for this model. Least square dummy variables (LSDV) are an acronym for least square dummy variables. The Wu-Hausman test will determine which test the researcher should use in their investigations.

## ii. Random effect model

The random effect model varies from the fixed effect model. The distinction between “random effects and fixed effects models” is that the latter interprets constants as random rather than fixed values for each section. The random effect model is superior to the fixed effect model in terms of effectiveness. It's possible to use the random effect model to include more explanatory variables with equal weight in the model because it has fewer variables than the fixed effect model that was used in the estimate (Clarke, P., Crawford, C., Steele, F., and Vignoles, A. 2010).

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8it} + \varepsilon_{it}$$

$$ROA_{it} = \alpha + \beta_1 CS_{it} + \beta_2 LEV_{it} + \beta_3 PGR_{it} + \beta_4 VOC_{it} + \beta_5 LIQ_{it} + \beta_6 UWR_{it} + \beta_7 GDP_{it} + \beta_8 INF_{it} + \varepsilon_{it}$$

$$ROE_{it} = \alpha + \beta_1 CS_{it} + \beta_2 LEV_{it} + \beta_3 PGR_{it} + \beta_4 VOC_{it} + \beta_5 LIQ_{it} + \beta_6 UWR_{it} + \beta_7 GDP_{it} + \beta_8 INF_{it} + \varepsilon_{it}$$

## iii. Hausman test

This research will use the Hausman test in this investigation to determine which model is more appropriate for this research. The test helps to choose between fixed-effects and random-effects models. According to the null hypothesis, the preferred model is random effects. The alternative hypothesis is that the model comprises fixed effects. Basically, the test checks to see if there is a correlation between unique errors in the model and the regressors. The null hypothesis states that there is no correlation between the two (Dodge, 2008). The “Hausman test” is all about the difference between “random and fixed effects.”

$$\beta_{RE} - \beta_{FE}$$

## iv. Schematic diagram

This framework illustrates the microeconomic and macroeconomic aspects that influence a company's financial performance. ROA and ROE are two financial performance indicators.

Many factors influence these indicators, which impact the overall performance of any organization anywhere in the world. The components in this study will be divided into microeconomic and macroeconomic factors by the researchers. Company size, leverage, premium growth, volume of capital, liquidity, and underwriting risk are all microeconomic considerations to be considered. GDP and inflation are macroeconomic parameters.

### 2.1.8. Ethical Considerations

To ensure the study's ethical principles adhere to the highest ethical standards in terms of informed permission, confidentiality, privacy, and secrecy. All secondary data gathered from various sources will be used solely for the objectives of this study. Data collected from the Insurance Association of Cambodia, the Ministry of Economy and Finance, and all insurance companies will be kept confidential and used only for this study. The researchers also thanked all the authors and researchers who had worked on this project before them.

## 2.2 Research Results

This section describes the research result, which includes two parts. Part one is descriptive statistics, and the other part is regression diagnostics.

### 2.2.1. Descriptive Statistics

The researcher presents descriptive statistics for the dependent and independent variables utilized in the study in this part. The financial performance of the insurance companies, as assessed by ROA and ROE, is the dependent variable. Company size, leverage, premium growth, capital volume, liquidity, underwriting risk, GDP, and inflation are the explanatory factors. There were a total of 143 observations for dependent and independent variables gathered from thirteen insurance firms between 2009 and 2019. The mean, maximum, minimum, and standard deviation of all research variables were obtained as overall descriptive statistics in the study. Table 2-2 summarized and showed the results of the descriptive statistics.

**Table 2-2: Descriptive analysis**

	ROA	ROE	CS	LEV	PGR	VOC	LIQ	UWR	GDP	INF
Mean	4.37	6.54	16.62	24.11	14.63	67.72	58.40	25.13	6.40	2.74
Median	4.31	6.56	16.47	17.02	12.52	69.36	59.47	24.12	7.1	2.93
Maximum	11.97	16.18	18.96	87.26	58.99	98.44	98.68	61.04	7.5	5.48
Minimum	-3.56	-7.61	15.64	0.22	-23.65	32.35	5.44	1.38	0.1	-0.66

Std. Dev.	2.92	4.59	0.68	19.71	14.12	16.81	25.87	13.83	2.03	1.51
Sum	624.69	935.76	2376.86	3447.06	2092.18	9683.88	8350.94	3593.61	915.2	392.47
Sum Sq. Dev.	1212.38	2997.86	66.23	55184.64	28310.13	40129.79	95029.27	27164.90	587.86	325.24

Note: Observations: 143, ROA: return on asset, ROE: return on equity, CS: company size, LEV: leverage, PGR: asset growth rate, VOC: volume of capital, IR: investment ratio, LIQ: liquidity, UWR: underwriting ratio, GDP: global domestic product, INF: inflation.

As indicated above in Table 2-2, the mean ROA and ROE for all insurance companies in the last eleven years were +4.37 and +6.54, respectively, with a minimum value of -3.56 and -7.61 and a maximum value of +11.97 and +16.18. From the result, we can understand that, on average, for the last eleven years, insurance companies in Cambodia earned +4.37 and +6.54 units of their total assets and total equity. In addition, the company's good financial performance and low risk mean it has a +4.37 profit before tax to total asset ratio and a +6.54 profit before tax to total equity, which means for a single unit invested, there is a return of +11.97 units on assets and 16.18 units on equity. On the other hand, the least financially performed insurance company in the last eleven years earned a loss of -3.56 on total assets and -7.61 on total equity. The maximum value indicates the Cambodian insurance corporation, and the minimum value indicates one of the privately-owned insurance companies. In addition to that, the standard deviation for ROA and ROE was +2.92 and +4.59, which means the ROA and ROE of most insurance companies concentrate around the mean value of +4.37 and +6.54, respectively.

The first explanatory variable of the research, as shown in Table 2-2, is company size, which has an average mean value of +16.62, clearly displaying the average maximum and minimum company sizes that were recorded and reported from 2009 to 2019, which are +15.64 and +18.96, respectively. Table 2-2 also shows the standard deviation as a percentage, which is +0.68. This shows that over the past 11 years, there has been a lot of variation in Cambodian insurance companies.

Leverage ranges from +0.22 to +87.26, with a minimum of +0.22 and a high of +87.26. This means that throughout the evaluation period, there was an insurance firm with the highest leverage, or the ratio of total liabilities to total assets, of +87.26, and an insurer with the lowest leverage, or the ratio of total liabilities to total assets, of +0.22. However, from its mean value of +24.11, the ratio of total long-term obligations to total assets has spread by a standard deviation of +19.71. Leverage is the amount of debt used by insurance companies to fund 0.30

of their total assets. Insurance companies used debt to fund this amount, and they preferred debt to equity financing.

According to Table 2-2, the insurance company's average premium growth over the previous eleven years has been +14.63. From 2009 to 2019, the greatest and minimum premium growth rates were recorded as +58.99 and -23.65, respectively. Table 2-2 also shows a minor fraction of the standard deviation for premium increases, which is 14.12 percent. The rate at which insurance premiums go up is the same for all insurance companies, and there is no difference in the rate at which premiums go up.

The volume of capital is one of the microeconomic variables examined in this research. It's calculated by dividing total capital by total assets. Table 2-2 shows that its capital volume has a mean and standard deviation of +67.72 and +16.81, respectively. The maximum and minimum capital amounts are, respectively, +98.44 and +32.35.

Underwriting risk is another metric utilized in this study to measure insurance companies' financial performance. Underwriting risk is calculated using the ratio of net incurred claims to net earned premium. The underwriting risk has a mean and standard deviation of +25.13 and +13.83, respectively, as shown in Table 2-2. This means that the underwriting risk's mild variance among mean-value insurance businesses is +25.13. The underwriting risk's overall maximum and minimum values are +61.04 and +1.38, respectively. Firms with high underwriting risk have had an average of +61.04 underwriting risk during the last 11 years, while companies with low underwriting risk have had an average of +1.38 underwriting risk.

The last factor in the microeconomy is liquidity. Liquidity is utilized as another metric in this study to measure insurance companies' financial performance. Total current assets are divided by total current liabilities to arrive at this figure. Liquidity has a mean and standard deviation of +58.40 and +25.87, respectively, as shown in Table 2-2. This means that the liquidity ratio's mild variance among mean-value insurance businesses is +58.40. The liquidity ratio's overall maximum and minimum values are +98.68 and +5.44, respectively. Firms with high liquidity ratios have had +98.68 liquidity ratios during the last 11 years, while companies with low liquidity ratios have had +5.44 liquidity ratios.

One of the macroeconomic factors analyzed in this research is GDP growth; the country's average real GDP growth rate during the previous eleven years has been +6.4, as shown in table

2-2. From 2009 through 2019, the economy's maximum and minimum growth rates were +7.5 and +0.1, respectively. Table 2-2 also shows the standard deviation as a percentage, which for GDP is +2.03. The value of GDP is the same for all insurance firms, and there is no variation in the value of GDP between them.

Another macroeconomic indicator included in this study was the country's average inflation rate for the last eleven years, from 2009 to 2019. The highest rate of inflation was recorded in 2011, at +5.48, and the lowest rate was recorded in 2009, at -0.66. Over the research period, the rate of inflation was distributed, with a standard deviation of +1.51. Cambodia's inflation rate may not have had an effect on the financial performance of insurance companies during the time the research was done.

### **2.2.2. Model Selection and its specification**

To achieve the study's principal purpose, the researcher employed panel data modeling techniques. None of the results contradict the CLRM assumptions. As a result, using the Hausman specification test to compare time series and cross-sectional units of panel data is the method of choice. Gujarati (2004) found that when the amount of time series data (T) is large and the number of cross-sectional units (N) is small, the values predicted by the fixed effect and random effect models are likely to be comparable. As a result, the model presented is based on the computational efficiency of EViews 9. According to Hausman, the researcher can choose between fixed effects and random effects models by using the Hausman specification test at 5% significance levels.

According to Brooks (2008), panel estimator approaches, such as fixed-effects and random-effects models, can be employed in research. The random effect model always accounts for heterogeneity or distinctiveness among the selected firms by accounting for their unique intercept value. It is time-invariant, but it shows differences in values from one firm to the next; the fixed-effect model, on the other hand, has a time-variant mean value for the intercept. The decision value is determined by the researcher, who defines it as if a statistically significant P-value from the Hausman test is more significant only at a 5% significance level, the fixed-effect model is selected instead of the random effect, otherwise the fixed-effect model is preferred. The result for this is that the ROA and ROE Hausman test p-values are greater than 5%, which means that the fixed-effect model is right for this study and that the fixed effects specification is better. If indeed  $p > 0.05$ , the coefficients of the fixed effect and random effect models are not different, and this study should use the random effect model because it has smaller standard.

The Hausman test, which showed correlated random effects with a probe value of 1, for ROA and ROE, respectively, as shown in tables 2-18 and 2-19 (the details of the tables are in Appendix B), was greater than 0.05. The following result further shows that it will well generalize the overall model with the help of the cross-section fixed effect to support this research purpose.

### 2.2.3. Homoscedasticity and serial correlation of error term

Given the impossibility of collecting and using all relevant variables for estimating the financial performance of Cambodian insurers, fixed effects allow the research to address the potential bias because of the omitted variables. Sometimes, however, the first difference estimators can be more efficient than the fixed effects estimators (Wooldridge, 2006). This is notably the case if we release the assumptions of homoscedasticity and serial correlation necessary for using fixed effects. Here, the first difference estimator is more efficient as the changes in the error term for it are serially uncorrelated. To further consolidate the findings of the fixed effects, this research estimates the first difference models presented in Appendix G. The results of the first difference estimator in tables 2-41 and 2-42, confirm the significant effects of leverage, premium growth rate, volume of capital, underwriting risk, liquidity, GDP, and inflation with ROA and company size, leverage, premium growth rate, underwriting risk, GDP, and inflation with ROE. However, the company size does not hold if we release the error term assumptions with ROA, and the other two variables, volume of capital and liquidity, do not hold if we release the error term assumptions with ROE.

### 2.2.4. Cross-section Fixed Effect Regression

The following cross-section fixed-effect model gives the complete analysis of each individual variable that defines financial performance, which are ROA and ROE. The details of the Panel Least Squares regression on ROA and ROE are in Appendix B.

**Table 2-3: Panel Least Squares model regression on ROA and ROE**

Variable	ROA	ROE
Constant	-20.99 * (9.48)	-56.35 *** (14.63)
Company Size	1.16 *** (0.55)	3.42 *** (0.85)
Leverage	0.08 *** (0.01)	0.18 *** (0.02)
Premium Growth Rate	0.04 ***	0.08 ***

	(0.01)	(0.02)
Volume of Capital	0.06 ***	0.04 **
	(0.01)	(0.02)
Liquidity	-0.02 *	-0.03 *
	(0.01)	(0.01)
Underwriting Risk	-0.08 ***	-0.13 ***
	(0.01)	(0.02)
GDP	0.49 ***	0.50 **
	(0.11)	(0.18)
Inflation	-0.38 **	-0.33 *
	(0.14)	(0.22)
R <sup>2</sup>	0.74	0.75
Adjust R <sup>2</sup>	0.70	0.71
No. observations	143	143

Standard errors are reported in parentheses.

\*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, and 0.01 level, respectively.

At the 0.01 and 0.05 significance levels, all explanatory variables for microeconomic and macroeconomic factors like company size, leverage, premium growth rate, capital volume, liquidity, underwriting risk, GDP, and inflation have a statistically significant effect on the ROA and ROE of insurance companies' financial performance.

Tables 2-3 show the fixed effect model's regression findings for the dependent variables ROA of financial performance and their independent variables from microeconomic and macroeconomic components. The R-square value of 0.74, which equals 74%, indicates that the model is well-fitting. In the multiple regression line, the R-squared value of 0.74 may be suggested and observed. This may be further explained by the fact that the independent factors account for 0.74 of the total variance in ROA. The remaining 0.26 could not be explained by the explanatory factors included in this study's model. The P-value of 0.00 is likewise significant, indicating that the regression in the model adequately explains fluctuations in the dependant variable. At the 0.00 and 0.01 significance levels, this means that the whole model is very important and that all of the independent variables work together to make ROA vary.

Tables 2-3 show the regression findings of the fixed effect model on the dependent variables ROE of financial performance and their independent variables derived from micro and macroeconomic factors. The R-square value of 0.75, which equals 75%, indicates that the model is well-fitting. In the multiple regression line, the R-squared value of 0.75 may be assumed and observed. This may be further explained by the fact that the independent variables account for 0.75 of the overall variance in ROE. The remaining 0.25 could not be explained by the explanatory factors included in this study's model. The p-value of 0.00 is likewise significant, indicating that the regression in the model adequately explains fluctuations in the dependant variable. At the 0.00 and 0.01 significance levels, this means that the whole model is very important and that all of the independent variables are important together in causing ROE to vary.

### **2.2.5. Regression Descriptions**

To test assumptions, a variety of approaches have been utilized. This may give the researcher confidence that the data he or she is using is error-free. The researcher utilizes OLS multiple regressions to estimate the amount and direction of each explanatory variable's effect on the dependent variable. ROA and ROE are the dependent variables in this regression study, whereas company size, leverage, premium growth rate, volume of capital, liquidity, underwriting risk, GDP, and inflation are the independent factors. The following are the main findings of the research on the factors that affect the financial performance of insurance companies.

#### **v. Return on Assets Regression Descriptions**

An overall test of significance, the F-null statistic's hypothesis, is that all independent variable coefficients are equal to zero. At the 0.01 significance level, the F-statistic (0.00) is significant, indicating that the financial performance and associated factors used in the study sufficiently fit the model and that the explanatory variables are jointly significant. This means that all the explanatory factors have a statistically significant influence on the financial performance of insurance companies in Cambodia, and there's a 0.99 likelihood that the link between them isn't due to chance. The coefficient intercept ( $\alpha$ ) in the fixed effect estimation regression result in the above table is -20.99. This means that the average value of ROA would be -20.99 if all the factors that affect it were not present.

The company size coefficient is positive at +1.16 and statistically significant with a p-value of 0.00, which is less than 0.05, as shown in Table 2-3. This demonstrates that the size of a firm has a considerable positive relationship with its return on investment. Aside from that, the leverage coefficient is positive at +0.08 and statistically significant at 0.00, which is less than 0.05. This demonstrates that leverage and ROA have a considerable positive relationship. With a p-value of 0.00, which is less than 0.05, the coefficient of premium growth rate is positive (+0.04) and statistically significant. This demonstrates that premium growth rate and ROA have a considerable positive relationship. With a p-value of 0.00, which is less than 0.05, the coefficient of capital volume is positive at +0.06 and statistically significant. This demonstrates that capital volume and return on investment have a very positive relationship. Table 2-3 further reveals that the liquidity coefficient is -0.02, with a p-value of 0.06, as evaluated by current assets to current liabilities. In Cambodia, there is a small but substantial negative association between insurance company liquidity and ROA. The underwriting risk coefficient was negative (-0.08) with a statistically significant p-value of 0.00. Underwriting risk and return on investment (ROI) have a considerable negative connection. GDP has a positive regression coefficient of +0.49 and is statistically significant with a p-value of 0.00, which is less than 0.05. The GDP and ROA have a considerable positive association. Last but not least, the inflation coefficient is negative (-0.39) and statistically significant with a p-value of 0.00, which is less than 0.05. This demonstrates that inflation and ROA have a considerable negative connection.

Table 2-3 shows the results of the fixed effect regression model for ROA. With a p-value of 0.00 and an R-square of 0.74, the entire model is significant. This means that the factors studied may account for around 74% of the variables in the insurer's financial performance for ROA. The remaining 26% is explained by other variables not included in the study. Except for underwriting risk and inflation, which have a negative impact and significant effects on the financial performance of insurance companies. The results show that seven of the independent variables, such as company size, leverage, premium growth rate, volume of capital, and GDP, have positive impacts and significant effects on the financial performance of insurance companies. Liquidity also has a negative effect on the financial performance of insurance companies and a very small effect on their ROA.

#### **vi. Return on Equities Regression Descriptions**

The F-null statistic's hypothesis for an overall test of significance is that all independent variable coefficients are equal to zero. At the 1% significance level, the F-statistic of 0.00 is significant,

indicating that the financial performance and associated factors used in the study sufficiently fit the model and that the explanatory variables are jointly significant. This means that all the explanatory factors have a statistically significant influence on the financial performance of insurance companies in Cambodia, and there's a 0.99 likelihood that the link between them isn't due to chance. The coefficient intercept ( $\alpha$ ) in the random effect estimation regression result in table 2-3 is -56.35. This means that the average ROE would be -56.35 if all the factors that affect it were set to zero.

The coefficient of company size is positive at +3.42 and statistically significant with a p-value of 0.00, which is less than 0.05, as shown in table 2-2. This demonstrates that the company's size has a substantial positive relationship with its ROE. Aside from that, the leverage coefficient is positive at +0.18 and statistically significant at 0.00, which is less than 0.05. This demonstrates that leverage and ROE have a considerable positive impact. The coefficient of premium growth rate is positive (+0.08) and statistically significant. This demonstrates a significant positive relationship between premium growth rate and ROE. With a p-value of 0.03, which is less than 0.05, the coefficient of capital volume is positive at +0.04 and statistically significant. This demonstrates that capital volume and ROE have a very positive relationship. Table 2-3 further demonstrates that the liquidity coefficient is -0.03, with a p-value of 0.05, as evaluated by current assets to current liabilities. In Cambodia, there is a small but substantial negative association between insurance company liquidity and ROE. The underwriting risk coefficient was negative (-0.13) with a statistically significant p-value of 0.00. Underwriting risk and ROE have a considerable negative connection. GDP has a positive regression coefficient of +0.50 and is statistically significant with a p-value of 0.00, which is less than 0.05. GDP and ROE have a strong positive connection. The final point is that the inflation coefficient is -0.33 and statistically insignificant, with a p-value of 0.13, which is larger than 0.05. This demonstrates that inflation and ROE have a negligible negative connection.

Table 2-3 shows the results of the fixed effect regression model for ROE. With a p-value of 0.00 and an R-square of 0.75, the entire model is significant. This means that the factors studied may account for around 75% of the variables in the insurer's financial performance for ROE. The remaining 25% is explained by other variables not included in the study. The results also show that six of the independent variables, such as company size, leverage, premium growth rate, volume of capital, and GDP, have positive impacts and significant effects on insurance company financial performance, with the exception of underwriting risk, which has a negative impact and

significant effect. Liquidity and inflation also have a negative relationship and have little effect on the ROE of insurance businesses.

### **2.3. Regression Diagnostic**

This section examines statistics on insurance company financial performance using balanced panel data, in which all variables are tracked for each cross-section and period. The study includes a time series segment that spans 2009 to 2019, as well as a cross-section segment that looks at thirteen Cambodian insurance providers. There are four parts to this section. First, multicollinearity is talked about. The traditional linear regression model is then talked about. Part 4 discusses cross-sectional fixed effect regression, as well as model selection and specification.

#### **2.3.1. Multicollinearity**

Multicollinearity is defined by Gujarati and Potter (2009) as the occurrence of a perfect and a less than perfect linear connection between some or all explanatory variables in a regression model. Because of high multicollinearity, regression coefficients can be computed incorrectly, and isolating the influence of different factors on the dependent variables can be challenging. (Hair, Black, Babin, Anderson, and Tatham, 1998). In this research, multicollinearity is looked for using the correlation matrix and the Variance-Inflation Factor (VIF).

##### **2.3.1.1. Correlation Analysis**

The degree of the linear relationship between two variables is known as the correlation. Correlation coefficient ( $r$ ) values are usually positive or negative. Pearson's ( $r$ ), commonly known as linear or product-moment correlation, is the most widely used type of correlation coefficient. The correlation matrix is a table that displays the correlation coefficient for each variable separately. Because each variable is perfectly connected with itself, the table's diagonal value is always 1. The correlation matrix shows whether the variables are related to one another. The correlation matrix also tells us whether there are any negative or positive connections between variables if there are any (Table 2-5).

As shown in Table 2-5, there is a strong relationship between the dependent variables of ROA and ROE and the independent factors of firm size, leverage, premium growth rate, capital volume, liquidity, underwriting risk, GDP, and inflation.

**Table 2-5: Correlation Matrix**

	<i>ROA</i>	<i>ROE</i>	<i>CS</i>	<i>LEV</i>	<i>PGR</i>	<i>VOC</i>	<i>LIQ</i>	<i>UWR</i>	<i>GDP</i>	<i>INF</i>
ROA	1									
ROE	0.89	1								
CS	0.03	0.20	1							
LEV	0.05	0.32	0.38	1						
PGR	0.14	0.24	-0.19	0.08	1					
VOC	0.28	-0.04	-0.43	-0.59	-0.08	1				
LIQ	-0.18	-0.20	-0.09	-0.16	-0.04	0.16	1			
UWR	-0.58	-0.47	-0.10	0.25	0.11	-0.32	-0.03	1		
GDP	0.42	0.45	0.15	0.13	0.31	-0.06	-0.04	-0.14	1	
INF	0.06	0.10	-0.05	0.04	0.31	-0.10	0.00	0.02	0.67	1

In the financial performance of insurance companies, ROA and ROE show a strong positive relationship with each other, +0.89. Similarly, GDP and inflation are also positively correlated with each other at +0.67.

In rapidly growing economies like Cambodia, financial performance factors such as company size, leverage, premium growth rate, and volume of capital have shown a positive correlation with ROA and ROE of the financial performance of insurance companies. At the same time, company size, leverage, and premium growth rate tend to impact both the ROA and the ROE of the financial performance of insurance companies positively, except that the volume of capital has a positive correlation with ROA, as +0.28, and a negative correlation with ROE, as -0.04. This implies that the optimal level of between company size, leverage, premium growth rate, and volume of capital holdings is an important financial performance factor, as it determines the ability of insurance companies to manage and assure better financial performance. Leverage has a positive correlation with the ROE of +0.32 on the financial performance of insurance companies. On the other hand, the volume of capital has a positive correlation with ROA of +0.28 on the financial performance of insurance companies.

Underwriting risk has a -0.58 and -0.47 with respect to ROA and ROE, the insurance companies' financial performance. Liquidity, on the other hand, has a -0.18 and -0.20 negative connection with ROA and ROE, respectively. According to the optimum risk management hypothesis, liquidity and underwriter risk reduce ROA and ROE. As long as there isn't enough money and you can't pay, the risk of not being able to pay will have a negative effect on the financial performance of insurance companies.

Aside from that, macroeconomic factors (GDP) have a +0.42 and +0.45 correlation and influence on ROA and ROE, respectively. Inflation has a positive correlation of +0.06 and +0.10 with ROA and ROE, respectively. Inflation has a very small coefficient link with ROA and ROE, and it has no impact on ROA and ROE's financial performance.

### **2.3.1.2. Variance-Inflation Factor (VIF)**

The explanatory variables are not connected to one another under the multicollinearity assumption. Multicollinearity is a problem that emerges when the explanatory variables are extremely highly associated with one another. If near multicollinearity issues are present but neglected, R square will be high, but individual coefficients will have large standard errors, making the regression look excellent but the individual variables will be unimportant (Brooks, 2014). In terms of the variance inflation components, the severity of the problem of multicollinearity across the independent variables is investigated (VIF). Gujarati (2003) defines extremely collinear variables as those with a VIF greater than 10. In this study, the VIF results for each explanatory variable included in the regression model are very low (less than 3), showing that the estimated model does not have a serious multicollinearity problem. Since this is the case, multicollinearity between the explanatory variables is not a problem in Table 2-6 and Table 2-7 (Appendix B).

### **2.3.2. CLRM Assumptions and Diagnostic**

The CLRM's assumptions are focused on model mis-specification and how to correct it to increase research quality. The data validity of the research's regressed conclusion is preserved thanks to CLRM assumptions. As a result, the diagnostic test is used to see if the traditional linear regression model assumption has been violated (Brooks, 2008). There are diagnostic tests that look for heteroscedasticity, autocorrelation, and normality, which are all things that must be met for CLRM to work. The result of these tests is what we're going to talk about next.

#### **2.3.2.1 Zero Mean Value of Errors**

To make their first assumption about the average value of zero, the researchers used a traditional linear regression model. This assumption could never be broken if a constant item was introduced to the regression equation (Brooks, 2014). It was added to this study's linear regression model to meet the first assumption of the traditional model, which says that the error value must be zero. A constant was added to the model.

### **2.3.2.2. Normality**

In the CLRM, each residual is considered to have a normal distribution with a constant variance and a zero mean (Brooks, 2008). If the residuals were evenly scattered, then the histogram would look like a bell. The statistics Jarque-Bera provided were not important. Brooks (2008) says that the p-values at the bottom of the normality test screen must be greater than 0.05 in order to reject the null hypothesis of normality at the 0.05 level.

The following is the normalcy test hypothesis:

H0: The residuals are distributed properly.

H1: The residuals do not follow a normal distribution.

#### **Model 1: Return on Assets**

The Jarque-Bera normality test yielded a chi-square value of 0.08, which is significantly higher than the p-value of 0.05, as shown in Table 2-8 of Appendix B. The normality of the null hypothesis was tested in this study, but it did not hold up at the 0.05 level. This means that the residuals are evenly spaced and that the data fits the normal distribution assumption, which is what this shows.

In addition to the official evaluations for normalcy, we visually analysed the data using histograms. When a histogram's form resembles that of a bell curve, it indicates that the data may have originated from a normal population. The researcher looks at graph 2-1 of Appendix B, which shows that the graph has a bell curve. This shows that the residuals seem to be fairly evenly distributed.

#### **Model 2: Return on Equities**

As shown in Table 2-9 of Appendix B, the Jarque-Bera normality test yielded a chi-square value of 0.02, which is significantly lower than the p-value of 0.05. As a result, at the 0.05 significance level, the null hypothesis of normality cannot be rejected. This means that the residual doesn't have a normal distribution, and the data backs this up as well.

In addition to the formal tests for normalcy, we visually examined the data using histograms. When a histogram's form resembles that of a bell curve, it indicates that the data may have originated from a normal population. The researcher looks at graph 2-2 of Appendix B, which shows that the graph does not have a bell curve. This shows that the residuals seem to be evenly distributed.

### 2.3.2.3. Heteroscedasticity

The assumption of homoscedasticity states that the error variance is constant. The mistakes are heteroscedastic if their variance is not constant. If there is heteroscedasticity, the standard errors may be incorrect, and any conclusions drawn may mislead (Brooks, 2014). The Breush-Pagan/Cook-Weisberg test is a chi-squared test. The Breusch-Pagan/Cook-Weisberg test was used to look for heteroscedasticity under the null hypothesis that error variance is homoscedastic. If the test statistic has a p-value lower than the appropriate threshold ( $p > 0.05$ ), then heteroscedasticity is assumed, and the null hypothesis of homoscedasticity is rejected. Therefore, the results of ROA and ROE as shown in Table 2-10 and Table 2-11 were statistically significant, showing the existence of heteroscedasticity, respectively. The details of these two tables are in Appendix B.

### 2.3.2.4. Autocorrelation

The researcher used the correlogram-Q-statistic test and its p-value for partial autocorrelation (PAC) and autocorrelation (AC) analysis. No serial correlation means that PAC and AC would be close to 0 at all the lags, as well as the Q-statistic being insignificant with huge p-values if there isn't a lot of serial correlation, too. The autocorrelation results are shown in Table 2-12 of Appendix B. In this case, Table 2-13 in Appendix B shows the results of the PAC and AC tests, which reveal that, based on the Q-statistic and its p-value, there is no PAC and AC issue between the model's variables. In addition, a first-order serial correlation test is the Durbin-Watson (DW) statistic. The DW statistic evaluates the linear relationship between neighboring residuals in a regression model. The DW test was used to see whether the hypothesis ( $=0$ ) in the specification is correct. This is a common misunderstanding.

$$u_{it} = \rho u_{it-1} - \epsilon_{it}$$

The DW statistic will be about 2 if there is no serial relationship. If there is a positive serial correlation, the DW statistic will go below 2. (In the worst-case scenario, it will be close to zero). The statistic will be between 2 and 4 if there is a negative association. As a matter of thumb, test statistic scores in the 1.5 to 2.5 range are normal. Table 2-14 and Table 2-15 summarize the findings (Appendix B) for ROA and ROE, respectively. The DW statistic in these two models equals 1.84 and 1.90 for ROA and ROE, respectively. This indicates that DW is rather typical and that there was no serial correlation.

It was found that the Durbin-Watson test statistic for ROA and ROE was 1.84 for ROA and 1.90 for ROE. This means that there is no evidence for autocorrelation because it can be seen in the non-rejection area.

The Breusch-Godfrey test is another way to see if there is autocorrelation.

H0: The errors are unrelated to one another.

H1: The errors are related to one another.

The p-values for both forms of the test, the F-statistic and the R-squared form of the test, are considerably lower than 0.05, which means that a null hypothesis of no autocorrelation is not to be rejected. There is no evidence that there is no autocorrelation in the results of both types of the test.

#### **2.4. Explanatory Diagnosis for 12 General Insurance Companies**

This researcher does the explanatory diagnosis for twelve insurance companies to compare with the thirteen insurance companies. As a result of the cross-section fixed effect of Table 2-33 and Table 2-35 in Table 2-40, as shown in Appendix E, all the independent variables for the ROA model have the same impact, but the coefficients of these factors are similar. At the same time, all the independent variables for the ROE model have the same impact and the coefficients of these factors are similar except the volume of capital variable has a positive insignificant impact for twelve general insurance companies' data and a positive significant impact for thirteen insurance companies' data. Furthermore, the R-square coefficient of the ROA model for twelve general insurance companies is 0.75, which is higher than the R-square coefficient for thirteen insurance companies at 0.74, and the R-square coefficient of the ROE model for twelve general insurance companies is 0.76, which is higher than the R-square coefficient for thirteen insurance companies at 0.75. Based on the analysis result, the nature of general and life insurance, the financial performance of insurance companies for the ROA and ROE for twelve general insurance companies is the same as the thirteen insurance companies.

#### **2.5. Summary of the chapter**

This chapter presents the empirical analysis, which includes the research method, research results, and robustness check. This research used eleven years of time series panel data. The data for the microeconomic factors (internal factors) came from the Cambodian Insurance Association and the Ministry of Economy and Finance. The macroeconomic factors were found on the World Bank website. The researcher used EViews 9 for the data analysis, which included ordinary least squares to find the most important and influential explanatory variable for the data analysis. This

chapter also discussed how to measure DV and IV, an empirical model specification, and how to think about ethical considerations.

The research findings are the descriptive statistics that were calculated during the research. These statistics include the mean, maximum, minimum, and standard deviation for each research variable. The researcher used cross-section fixed effect regression after doing the Hausman test. To make sure the results aren't a fluke, the researcher uses robustness checks for testing multicollinearity, which include correlation analysis, variance-inflation factor, and CLRM assumptions and diagnostics. The assumptions of the CLRM are concerned with model mis-specification and how to repair it in order to improve research quality. This test includes zero mean value of errors, normality, heteroscedasticity, and autocorrelation.

## **CHAPTER THREE**

### **DISCUSSION**

In this chapter, the researcher presents the research findings, the summary and findings, the recommendation and implication of the research, and at the end of this chapter, the summary.

#### **3.1. Discussion of Research Findings**

The discussion of findings is focused on the results of empirical analysis, which includes the research method, research results, and robustness check. This result could be a response to the research question and the effect of each explanatory variable and the relationship between the dependent and independent variables on the financial performance of insurance companies in Cambodia, as we'll present next:

- The Cambodian country-specific factors of financial performance are company size, leverage, premium growth, volume of capital, underwriting risk, GDP. Liquidity and inflation don't have a significant impact on the financial performance, but inflation does have a significant impact on the financial performance of the ROA. In practice, the regulator used the rule-base solvency for the new insurance company and the risk-based solvency for the existing company, whose sale premium is over their minimum requirement. Besides that, inflation does not significantly impact ROE because the insurance industry in Cambodia is a new industry and does not have more data yet, which should be included for future research.
- The influencing factors for the financial performance of the ROA and ROE are company size, leverage, premium growth, volume of capital, liquidity, underwriting risk, GDP, and inflation. The two types of influence factors are positive and negative. Company size, leverage, premium growth, volume of capital, and GDP are all positive influences, while liquidity, underwriting risk, and inflation are all negative influences. In practice, big companies' sizes get more trust than small companies' sizes, and the companies could get more premiums. The insurance regulator does not allow the insurance companies to loan or borrow from the bank or even from their parent companies. Also, the insurance regulator and insurance companies must keep an eye on and regularly evaluate the negative effects that could cause financial problems for their industry and companies.

- The Cambodian context's specific factors that have positively influenced the financial performance of insurance companies are company size, leverage, premium growth, volume of capital, and GDP; and it has a negative influence on underwriting risk and inflation for ROA and underwriting risk for ROE.

### **3.1.1 The influence of company size on financial performance**

The company size of an insurance firm is calculated as a logarithm of its total assets. The result of regression is shown in tables 2-3. The standardized coefficient of company size reveals that, all other conditions being equal, a 1 unit increase in size results in a +1.16 unit rise in average ROA. This shows that larger insurance companies may be more efficient, and their scale provides them with a competitive edge to enhance performance. The positive effect of company size is consistent with their prior expectations. This means that the ROA will improve by an average of +1.16 units for every unit increase in business size. This may be because of economies of scale being eased by insurance firms due to controlled increases in size. The standardized coefficient of company size shows that, all other factors remaining constant, an increase in size by 1 unit leads to a growing average return on equity of +3.42 units. This means that the ROE will improve by an average of +3.42 units for every unit increase in business size. This may be because of economies of scale being eased by insurance firms due to controlled increases in size.

According to Majumdar (1997), when businesses get larger, they may have inefficiencies, resulting in poor financial performance. The findings are in direct opposition to the resource-based theory, which asserts that there is a positive and substantial association between company size and financial performance. The regression results of this study agree with Cummins et al. (2002), Lee (2014), Derbali (2014), Kazeem (2015), and Mwangi et al. (2015), who found that insurance companies in Cambodia did better when their size was bigger.

### **3.1.2 The influence of leverage on financial performance**

The debt-to-equity ratio is used to calculate leverage. Consider the company's capital structure as well as the risk and reward of long-term debt and equity. This is called leverage. The results show that, using a standardized coefficient and holding all other factors constant, a 1 unit increase in the leverage of financial performance of insurance companies in Cambodia leads to an

average +0.08 unit increase in their ROA and a +0.18 unit increase in their ROE, respectively, of financial performance, and the increases are significant.

Hence, the results are consistent with the hypothesis of the research with the correlation analysis. Since there is a positive significant association between leverage and ROA and ROE financial performance, insurance companies in Cambodia were positively significantly affected by a decrease in their level of leverage during the research period of 2009 to 2019.

This finding does not contradict previous research, which determined that leverage and profitability, or a company's financial performance, have a positive relationship. Hifza (2011), Bawa and Chattha (2013), Derbali (2014), Hanna (2015), and Behaylu (2017) have all done research that is very similar to this one.

### **3.1.3 The influence of premium growth on financial performance**

Premium Growth: Most insurers' principal source of revenue is premium revenue, which is more consistent than other revenue streams. As a result, premium growth should aid in forecasting revenue and profitability growth in the future. The pace of market penetration is measured by premium growth. The percentage change in total assets is divided by the percentage change in insurance company premiums (Abate, 2012). This gives the growth in premiums.

The results show that, using a standardized coefficient and holding all other factors constant, a 1 unit increase in the premium growth of insurance companies in Cambodia leads to an average +0.04 unit increase in their ROA and a +0.08 unit increase in their ROE, respectively, of financial performance, and the increases are positive and significant.

The regression model's findings reveal that premium growth has a positive and statistically significant relationship with ROA and ROE, the financial performance of insurance companies. The positive coefficient of growth premium indicates that growth premium and ROA, as well as growth premium and ROE, have a direct relationship. It means that insurance companies that write more premiums over time have a better chance of making money because they get a return on their money when they spend a lot of time and money on marketing to get more premiums and a lot less time and money on managing their portfolios.

The findings of the study, which were backed up by prior research by Sumaira et al. (2013), demonstrated a favorable and substantial association between premium growth and insurance company financial performance. In their study, Daniel et al. (2013) did find a positive but not very strong link between higher premiums and finance success.

#### **3.1.4 The influence of volume of capital on financial performance**

Volume of Capital: the volume of capital is a capital strength because it is a ratio calculated as total capital to total assets of the insurance company.

The standardized coefficient of the volume of capital shows that all other factors remain constant. An increase in capital by 1 unit leads to a growing average ROA of +0.06 units. This means that the higher the capital level of insurance companies, the higher the profitability levels may be bred by having more capital. The positive effect of the volume of capital is consistent with their prior expectations. This means that for every unit increase in volume of capital, the ROA will grow by an average of 6 units. This may be because of economies of scale being reaped by insurance companies due to controlled increases in capital. The standardized coefficient of the volume of capital shows that, all other factors remaining constant, an increase in size by 1 unit leads to a growing average ROE of +0.04 units. This means that for every unit increase in capital volume, the ROE will grow by an average of 4 units. This may be because of economies of scale being reaped by the insurance company due to controlled increases in capital.

In their different investigations, Athanasoglou et al. (2005), Ahamed (2008), Malik (2011), and Ayele (2012) discovered that capital volume has a considerable impact and a favorable relationship with profitability. Berger (2001) provides empirical evidence that bank profitability and capital have a favorable relationship. According to Charumathi (2012), the logarithm of equity capital has a negative and severe impact on the profitability of Indian life insurers. In contrast to the findings of others, Idris (2011) determined in their analysis that capital adequacy has no relationship with financial performance. The research findings show that the volume of capital and the ROA and ROE of financial performance of insurance companies in Cambodia have a significant and positive influence.

#### **3.1.5 The influence of liquidity on financial performance**

The current asset to current obligation ratio is used to determine liquidity. In Cambodia, there is a small negative relationship between the insurance companies' financial performance in terms of ROA and ROE and the amount of money they have. Consequently, the result contradicts the study premise as well as the correlation analysis result, which indicates a weak connection of -0.02 between liquidity and ROA and -0.03 with ROE. The researcher did not reject the null hypothesis that there is no relationship between liquidity, ROA, and ROE. He found no such relationship.

This insignificant relationship between liquidity and financial performance can be analyzed in two dimensions. The first is when the insurance company has a low liquidity ratio and this has an insignificant effect on their performance. This may be because of the need for cash or being liquid to pay claims of customers, employee salaries, and other miscellaneous expenses, but the major portion of cash payment is for paying claims. When insurers sell policies, they collect cash immediately and pay claims. The payment process takes a long time, so it does not have a significant effect on their paying ability, which means their liquidity. A very high ratio means that the insurance company has been holding on to extra cash, which has led to a loss of revenue from a variety of investments. The regression result shows there is an insignificant difference between whether this accumulated cash is invested or deposited in a bank. This may be since there are no different varieties of short-term and long-term investment options in Cambodia and the return on investments is not that much different from the deposit interest income for insurance companies.

Using a standardized coefficient and holding all other factors constant, a 1 unit increase in the liquidity of insurance companies in Cambodia leads to an average -0.02 unit decrease in their financial performance. But as we see, the reduction in performance is insignificant. This suggests that there isn't enough data to back up the negative correlation between liquidity and ROA. Using a standardized coefficient and keeping all other factors constant, a 1 unit increase in the liquidity of insurance companies in Cambodia causes their ROE to drop by an average of -0.03 units. But as we see, the increase in performance is very insignificant. This suggests that there isn't enough data to back up the negative correlation between liquidity and ROE.

The negative coefficient shows that an increase in liquidity has a negative and insignificant impact on insurance companies' financial performance. The results don't match up with previous studies that found a significant relationship between liquidity and ROA, like Hadush (2015),

Hanna (2015), and Mirie et al. (2015). The result of the study show that insurance companies in Cambodia are not doing well in terms of their liquidity, ROA, and ROE.

### **3.1.6 The influence of underwriting on financial performance**

Underwriting risk refers to the risk of loss and adverse changes in the value of insurance assets caused by insufficient pricing, insufficient premiums written by companies, and a lack of transparency in their provisioning. It is worked out by using the loss rate, which is a measure of how well underwriting works in the insurance industry.

Using a standardized coefficient and holding all other factors constant, Cambodian insurance companies' underwriting risk increased by 1 unit, which led to a -0.08 unit decrease in their ROA and a -0.13 unit decrease in their ROE, respectively, in terms of financial performance. The increase is both negative and significant.

The results of the model showed that there is a negative and statistically significant relationship between underwriting risk and financial performance (ROA and ROE). This research also suggests that insurance companies operating in Cambodia can effectively forecast future claims, losses, and expenses, allowing them to price their insurance contracts correctly. According to the research, high claim ratios imply premium prices are too low for a given level of risk, putting a company's profitability at risk, while a low claim ratio indicates an insurer is underwriting a successful business, according to the research. Reduced underwriting risk would enable insurers to improve their performance. This result is what the researcher was hoping for, and it fits many of the results of earlier studies.

According to Malik (2011), Mehari et al. (2013), Meaza (2014), Lee (2014), Burca et al. (2014), Kazeem (2015), Asrat et al. (2016), Demis (2016), and Datu (2016), profitability and underwriting risk have a negative and significant association. As a result, this argument shows that the underwriting risk or loss ratio has a negative effect on the insurance companies' financial performance in Cambodia.

### **3.1.7 The influence of GDP on financial performance**

GDP is the most important macroeconomic indicator of progress in economic development. GDP growth is a measure of a country's gross domestic product. As the result of regression, shown in Tables 2-3.

So, the results of the dependent variables ROA and ROE are in line with the hypothesis of the research and the correlation analysis, which is to say that they are in line with the results. The standardized coefficient of a gross domestic product shows that, all other factors remaining constant, an increase in the domestic product by 1 unit led to a +0.49 unit increase in their ROA and a +0.50 unit increase in their ROE, respectively. Economic growth and financial performance are closely associated, as seen by the variable's substantial positive coefficient. Economic growth may help insurance businesses perform better by boosting demand for financial services, thus raising insurers' cash flows and profit margins. When the economy improves, the demand for insurance services rises, which can lead to a high return on investment or profit margin for insurers.

Doreen (2013), Murungi (2014), Lee (2014), Suyehli (2015), Asrat et al. (2016), Kazimierz (2016), and Tariku (2019), all found the same thing: GDP has a positive impact on profitability of the firm, which means as GDP increases, profitability of insurance companies will also increase.

### **3.1.8 The influence of inflation on financial performance**

Inflation could affect ROA and ROE of insurance companies' financial performance, influencing both their assets and liabilities. In anticipation of inflation, claim payments and the amount of money needed to cover higher claims go up, which affects technical results and profits.

The result of regression is shown in tables 2-3. The inflation coefficient was negative, with a statistically significant value for ROA, showing that inflation has a significant impact on Cambodian insurers' financial performance. This implies that, using a standardized coefficient and holding all other factors constant, a 1 unit increase in inflation for insurance companies in Cambodia leads to an average -0.39 unit decrease in their ROA of financial performance. This is a significant negative relationship result.

Inflation may impact insurance companies' ROE of financial performance, affecting both their liabilities and equity. The inflation coefficient was negative and insignificant, showing that the effect of inflation on Cambodian insurers' ROE of financial performance is negligible. This means that, using a standardized coefficient and keeping all other factors the same, a one-unit increase in inflation among insurance companies in Cambodia leads to an average decrease of -0.33 in their return on equity (ROE), which is negative and insignificant.

Overall, this research discovered a negative and substantial association between inflation and the ROA of insurance companies' financial performance, as well as a negative and insignificant relationship between inflation and the ROE of insurance companies' financial performance. This means that the researcher rejects the null hypothesis that inflation and ROA have a negative and significant relationship while accepting the null hypothesis that inflation and ROE have a negative and negligible relationship, which is what the research showed.

As a result, the findings contradict the research's premise and those of Meaza (2014), Hanna (2015), Teklit et al. (2017), Asrat et al. (2017), Stephen et al. (2017), and Behaylu (2017). They discovered a negative and strong link between insurance company profitability and financial performance. So, the researcher rejects the null hypothesis that there is a strong and negative relationship between inflation and ROA. This is because it goes against the study's regression result.

Based on the findings, inflation influences the ROA but it has no influence on the ROE of insurance companies' financial performance in Cambodia because the research did not obtain enough statistical support to support it. There is a negative and significant relationship in ROA, but there is a negative and insignificant relationship in ROE. This result is also in line with what Tariku (2019), Stephen et al. (2017), and Hadush (2015) found, which is that inflation and ROA have a small but positive relationship.

As shown in Table 3-1 of Appendix D, the summary and comparison of what was expected and what actually occurred is given.

### **3.2. Summary and findings**

The essence of the financial performance of insurance companies is to provide the organization with the maximum return on the capital employed in the business. Improving the company's financial performance management is a significant contributor to the country's economic development. The findings focused on four main objectives of this research: to identify the factors influencing the financial performance of insurance companies; identify the additional determinants of the financial performance of insurance companies in the Cambodian context; suggest regulatory improvements for insurance companies in Cambodia; and suggest financial management improvements for insurance companies in the Cambodian context. And it could be a response to the main research question and sub-research question as stated in the research question section. So, the research focused on the financial performance of insurance companies, and it was

influenced by microeconomic and macroeconomic factors. The microeconomic factors include company size, leverage, premium growth, volume of capital, liquidity, and underwriting risk. The macroeconomic factors included gross domestic product and inflation. ROA and ROE were used to figure out how well and how risky insurance companies operating in Cambodia were.

The purpose of this research was to empirically investigate the insurance companies' financial performance in Cambodia using panel data obtained from the annual financial audit report comprising thirteen insurers over the period of 2009 to 2019 from AIC and MEF. The researcher used diagnostic tests, selection of an appropriate model, multiple regression results, and tests of hypothesis using EViews version 9. Regression analysis was identified as the most appropriate tool for econometric analysis of the data. The model that was selected for this research was the Fixed Effect Model since the data was selected purposively and diagnostic tests of all assumptions were included, as the errors have zero mean, multicollinearity, heteroscedasticity, normality, and autocorrelation were validly tested. The results show company size, leverage, premium growth, the volume of capital, underwriting risk, GDP, and inflation have significant effects on ROA's financial performance. ROA's financial performance is negatively and insignificantly correlated with liquidity. Company size, leverage, premium growth, the volume of capital, underwriting risk, and GDP have significant effects on financial performance, as measured by ROE. Liquidity and inflation have a negative and insignificant correlation with the insurance companies' financial performance in Cambodia. Based on the analysis, the major summary of the study findings is presented below:

- The descriptive analysis shows that the mean value of ROA and ROE for insurance companies was +4.37 and +6.54, respectively. The mean value of company size was +16.62, the mean value of leverage was +24.11, the mean value of premium growth was +14.63, the mean value of the volume of capital was +67.72, the mean value of liquidity was +58.40, the mean value of underwriting risk was +25.13, the mean value of GDP was +6.40, and the mean value of inflation was +2.74.
- The correlation matrix showed the highest correlation between underwriting risk and ROA, which is a negative correlation of -0.58. The next highest correlation is between underwriting risk and ROE, which has a negative correlation of -0.47. The result also shows a positive correlation between ROA and GDP and the volume of capital, with correlation

coefficients of +0.42 and +0.28, which is significant at a 1% significant level. ROA was correlated with the explanatory variables company size, leverage, premium growth, and inflation, which have correlation coefficients of +0.03, +0.05, +0.14, and +0.06, respectively. And the correlation between ROA and explanatory variables such as company size, leverage, premium growth, and inflation is insignificant at a 0.1 level of significance. By the way, liquidity had a negative correlation with ROA, which had a correlation coefficient of -0.18 and was insignificant at a 0.1 level of significance. ROE was correlated with the explanatory variables company size, premium growth, and inflation, which have correlation coefficients of +0.20, +0.24, and +0.10, respectively. And the correlation between ROE and explanatory variables such as company size, premium growth, and inflation is insignificant at a 0.1 level of significance. By the way, the volume of capital and liquidity had a negative correlation with ROE, which had a correlation coefficient of -0.04 and -0.20 and was insignificant at a 0.1 level of significance.

**Inferential analysis of the factors of financial performance of Cambodian insurers yielded several interesting findings:**

- The coefficient of company size was +1.16 and its p-value was 0.03, which implies a significant positive relationship between company size and the ROA of the financial performance of insurance companies in Cambodia. The coefficient of company size was +3.42, and its p-value was 0.00. This means that there is a significant positive relationship between company size and the ROE of the financial performance of insurance companies in Cambodia.
- The coefficient of leverage was +0.08 and its p-value was 0.00, which implies a significant positive relationship between leverage and the ROA of the financial performance of insurance companies in Cambodia. The coefficient of leverage was +0.18 and its p-value was 0.00, which implies a significant positive relationship between leverage and the ROE of the financial performance of insurance companies in Cambodia.
- The coefficient of premium growth was +0.04 and its p-value was 0.00. This means that there is a significant positive relationship between company size and the ROA of insurance companies in Cambodia. The coefficient of premium growth was +0.08 and its p-value was

0.00, which implies a significant positive relationship between premium growth and the ROE of the financial performance of insurance companies in Cambodia.

- The coefficient of the volume of capital was +0.06 and its p-value was 0.00, which implies a significant positive relationship between the volume of capital and the ROA of the financial performance insurance companies in Cambodia. The coefficient of the volume of capital was +0.04 and its p-value was 0.03, which implies a significant positive relationship between the volume of capital and the ROE of the financial performance insurance companies in Cambodia.
- The coefficient of liquidity was -0.02 and its p-value was 0.06, which implies an insignificant negative relationship between liquidity and the ROA of financial performance of insurance companies in Cambodia. The coefficient of liquidity was -0.03 and its p-value was 0.05, which implies an insignificant negative relationship between liquidity and the ROE of the financial performance of insurance companies in Cambodia.
- The coefficient of underwriting risk was -0.08 and its p-value was 0.00, which implies a significant negative relationship between underwriting risk and the ROA of the financial performance of insurance companies in Cambodia. The coefficient of underwriting risk was -0.13, and its p-value was 0.00. This means that there is a significant negative relationship between underwriting risk and the ROE of insurance companies in Cambodia.
- The coefficient of GDP growth was +0.49, and its p-value was 0.00. This means that there is a significant positive relationship between GDP growth and the ROA of the financial performance of insurance companies in Cambodia. The coefficient of GDP growth was +0.50 and its p-value was 0.00, which implies a significant positive relationship between GDP growth and the ROE of the financial performance of insurance companies in Cambodia.
- The coefficient of inflation was -0.38, and its p-value was 0.00. This means that there is a significant negative relationship between inflation and the ROA, which measures how well insurance companies in Cambodia are doing financially. The coefficient of inflation was -0.33, and its p-value was 0.13. This means that there wasn't much of a link between inflation and how well insurance companies in Cambodia did financially, as measured by their ROE.

From the research results, a valid model for the financial performance of insurance companies in Cambodia's economy, which is growing quickly, has been made and is summed up below:

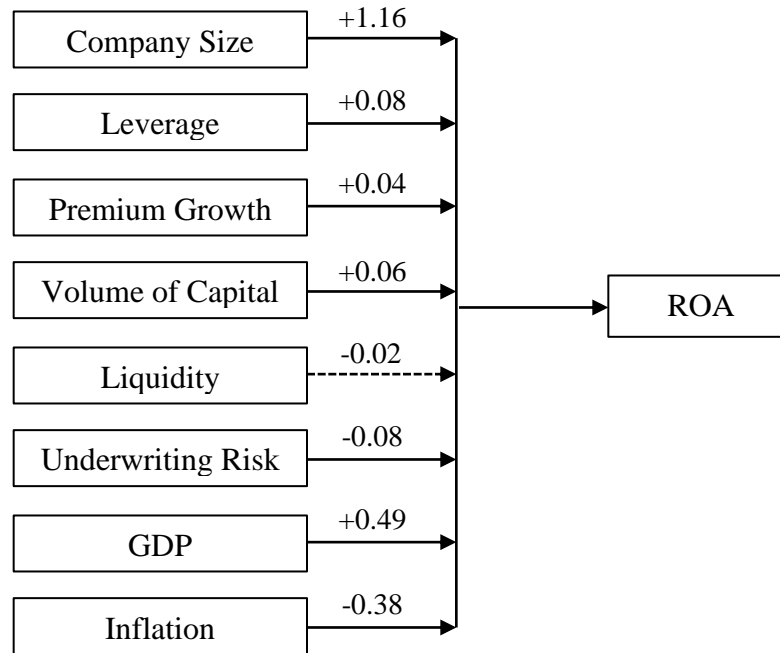


Figure 3-1: The model 1: The financial performance (ROA) of insurance companies in rapidly growing economies

Noted:   
 —————> Significant path coefficient or significant variable   
 - - - - -> Insignificant path coefficient or insignificant variable

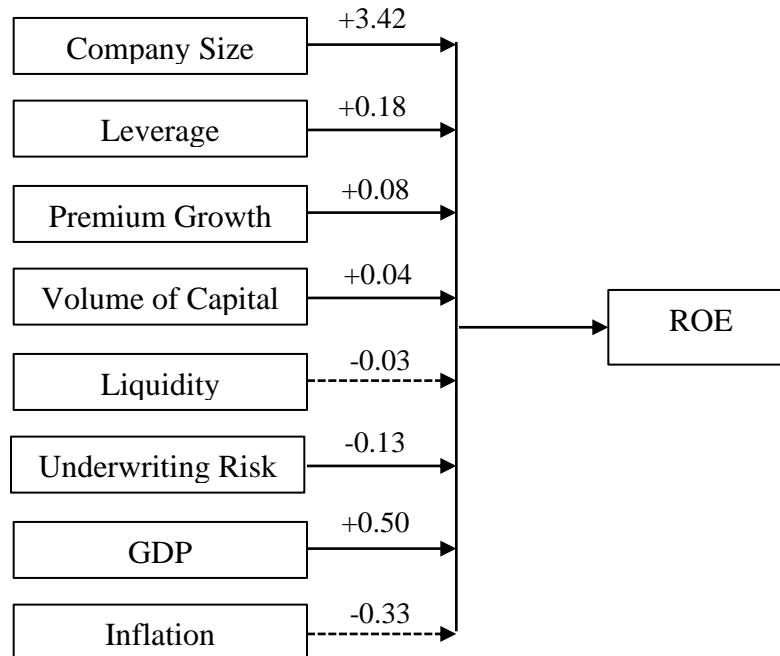


Figure 3-2: The model 2: The financial performance (ROE) of insurance companies in rapidly growing economies

Noted:   
 —————> Significant path coefficient or significant variable   
 - - - - -> Insignificant path coefficient or insignificant variable

### **3.3. Recommendations and Implication of the research**

This section presented the recommendations and implications of the researcher as below:

#### **3.3.1. Recommendations**

The research recommendation was premised on the summary and conclusions from the results and discussion. The research has shown a clear understanding of microeconomic and macroeconomic factors that influence the insurance companies' financial performance in Cambodia. Based on the research findings, the researcher has drawn the following recommendations:

- i. Policymakers and insurance regulators should increase insurance coverage for the poor and most vulnerable people by developing more products and improving pricing competitiveness to protect financial loss and reduce poverty, up to and including ending poverty. At the same time, they must do a thorough underwriting calculation and move the risk to other reinsurance companies, especially when it comes to rising health care costs, to avoid a loss that could put the insurance companies out of business.
- ii. Insurance premiums and coverage should be increased because insurance will protect against the loss of financial stability for individuals and companies, enabling them to maintain financial stability and economic growth. Besides that, the insurance industry provides more jobs for people to reduce unemployment and stimulate economic growth.
- iii. To reduce inequalities and maintain financial stability, policymakers, insurance regulators and insurance companies should promote the insurance to everyone and all types of people in the country, such as sex, age, disability, race, class, ethnicity, religion, and opportunity.
- iv. Insurance regulators and insurance companies should keep a close eye on and evaluate all important factors, such as company size, leverage, premium growth, the volume of capital, underwriting risk, GDP, and inflation, regularly and as needed.
- v. Based on the research results, the empirical evidence from the past and present shows that the different results between explanatory variables and dependent variables could lead to more research in the area. The researcher says that more research on the financial performance of insurance companies is needed because the scope of this research will not be limited to a certain time period and the independent and dependent variables will not be limited to this specific variable.

- vi. If enough literature is found, future research can look at both the financial and non-financial aspects of financial performance in the insurance sector and the factors that affect them separately to learn more about each part.
- vii. The microeconomic factors are primarily determined by the insurer's financial performance. So, it is recommended that the board and management of insurance companies give high attention by considering the effect of each variable. Whereas the macroeconomic factors are not controlled by the management. So, insurance companies should work with the Ministry of Economy and Finance or the government to find the outside factors.
- viii. A high claims ratio means that insurance premiums are too low for the level of risk and that the financial performance of insurance companies will be risky, so they should raise prices. As a result, the researcher suggests that insurers try to reduce the impact of underwriting risk by implementing a risk management strategy that considers the relationship between all aspects of the company's business line, better actuarial analysis, better risk differentiation strategy, better pricing, and better retention to achieve superior insurance companies' financial performance by raising premium rates. Reducing the amount of premiums paid will aid in improving the profitability of insurance companies. To safeguard its capital buffer, the industry should hold on to planned reserves.
- ix. The insurance companies were operating in a low liquidity condition. So, insurers must convert an insurance company's assets immediately to cash and reflect the company's capacity to manage its working capital while it is maintained in reserve in normal condition. They should also be very careful about their liquidity risk and come up with a strategy like a cash flow forecast and liquidity management program to help them deal with the high liquidity risk.
- x. This research investigates the factors affecting the financial performance of insurance companies in Cambodia by viewing only limited variables using eleven years of data and thirteen insurers. However, the variables used in this research did not include all the factors that can affect the financial performance of Cambodian insurers. Thus, future researchers should conduct research on the financial performance of insurance companies in Cambodia by increasing the number of observations, using a larger sample size and longer data periods, and by including previously unknown company-specific, industry-specific, and

macroeconomic variables. In addition, future research should include investment and interest rate variables, increase sample size, and develop two distinct models for general and life insurance. Apart from that, which could be extended to other countries.

### 3.3.2. Prioritizing Recommendations

According to the finding, the researcher's priority recommendation that it be involved with policyholders, insurers, regulators, policymakers, and researchers can be used to put it in order, and it will let people figure out how important, urgent, or different each one is, as shown in Table 3-2.

**Table 3-2: Prioritize Recommendations**

Recommendations	Priority in terms of urgency	Priority in terms of importance
R no. 1	High	Very high
R no. 2	High	High
R no. 3	High	High
R no. 4	High	High
R no. 5	High	Moderate
R no. 6	Moderate	High
R no. 7	High	Very high
R no. 8	Very high	High
R no. 9	High	High
R no. 10	High	High

Noted: R is recommendation

Based on the finding and the prioritizing recommendation, the researcher breaks down the Eisenhower matrix into four quadrants, and it is represented in Table 3-3 as below:

**Table 3-3: Eisenhower matrix for recommendations**

Recommendations	Urgent	Less urgent
Important	R1, R2, R3, R4, R7, R8, R9, R10	R6
Less important	R5	

### **3.3.3. Implication of the Research**

Based on the research findings, the research has implications for policymakers and regulators; practical implications for the insurance industry; and implications for literature and researchers. This is significant because it adds to existing research by providing more results to confirm or refute previous research findings; adds value to existing knowledge; suggests improvements for practice; and provides information to policymakers and other decision-makers.

#### **3.3.2.1. Implications for Policymakers and Regulators**

- The Ministry of Economy and Finance should upgrade the insurance regulator from a department level to a general department level so that it can run the regulatory, which is an institutional structure that is needed because the insurance industry is growing.
- Cambodia's financial sector policies are widely acknowledged to depend mainly on endogenous factors to develop the nation's competitiveness. The insurance industry is one of the non-bank financial services in Cambodia. So far, these policies have led to strong economic growth. The Ministry of Economy and Finance should improve the community's outlook and make sure everyone has insurance.
- Underwriting risk and inflation have a negative effect on the financial performance of insurance companies. The government or insurance regulator should strengthen oversight of the insurance sector's financial performance and related performance to ensure its stability. The results of this research are important for Cambodia if the insurance industry's performance is seen as the main driver of both corporate and national growth.
- The research also contributed to policy-making decisions by stakeholders, including the insurance regulator and insurance companies. The financial performance of insurance companies is important because they play an important role in the economic growth and development of the country by lowering underwriting risk and liquidity risk and by making the country more stable through the handling of financial losses and the efficient use of resources like money.
- There are a lot of things that can go wrong if insurance companies don't properly manage their underwriting risk and their liquidity risk. This can cause problems for the industry like price undercutting and fraudulent practices, as well as high loss ratios and poor

performance. Governments, insurance regulators, policymakers, and insurance companies could be able to use the findings of the research to help them figure out what should be done to manage the risks in the insurance industry.

- The liquidity variable has a negative correlation and is insignificant in terms of the insurance companies' financial performance in Cambodia. Based on current practice, the government uses rule-based solvency for the new insurance company and uses risk-based solvency for the insurance company that has more than the minimum requirement for solvency. This practice makes the insurance company's financial performance have enough liquidity to perform its financial duties, and the government should allow the insurance company to use this liquidity to invest in potential investment markets such as capital markets, real estate, etc. to generate more income from investment because the insurance company's income could get from premiums and investment.
- The research also suggests that there is a need for the government to intervene regarding macroeconomic effects using monetary policies, which are mainly focused on stabilizing the inflation rate in the economy, which has a negative relationship with the insurance companies' financial performance in Cambodia. That is, policies aimed at reducing inflation should take precedence over policies aimed at increasing financial intermediation.
- The findings of empirical evidence show that all factors are significant for financial performance, except liquidity for ROA and liquidity and inflation for ROE. Based on the results of the study, the insurance penetration and density in Cambodia, and the growth of the insurance industry, the government or the regulator needs to improve the insurance industry by using the media to educate the public and by adding an insurance program to the curriculum of both public and private schools to teach students about insurance.

### **3.3.2.2. Practical Implications for the Insurance Industry**

- According to this research, to the increasingly knowledge-based economy in modern organizations, this research was oriented toward determining the financial performance factors of Cambodia's insurance industry. Based on the findings of empirical evidence, the factors are powerful explanatory factors to determine the insurers' financial performance. So, the results of this study suggest that insurers with lower financial performance should work to improve their value creation by keeping an eye on and adapting to important

microeconomic variables of financial performance of insurance companies. This will help them do their jobs well and give the business a competitive edge.

- The company's size had a positive and significant impact on the financial performance of the company. This means that the management of the firm should pay attention to this factor. The larger company size might earn more money and might get more trust from the community and policyholders because the insurance business is a contract between the insured person and the insurer. This tells management that big insurance companies are more likely to be profitable when it comes to total assets, which is what management looks at.
- Leverage had a positive and significant impact on the financial performance of insurance companies. This means that the management of the firm must pay attention to the factors that could be boosting the firm's performance, such as company size, leverage, premium growth, volume of capital, and GDP growth, and they have to monitor closely the risk factors such as liquidity, underwriting risk, and inflation that could create an issue for the financial performance of the insurance companies. The risk factors are smaller as well, especially the ones that include company-specific factors. These could be controlled by the companies. The greater leverage will have greater financial performance. The management must closely monitor and evaluate the risk factor or negative impact factor of the financial performance so that it will cause the issue of the financial performance. There is a good chance that if the company sells more policies, it will improve its ROA and ROE, financial performance of insurance companies.
- The premium growth had a positive and significant impact on the financial performance of insurance companies in Cambodia. This means that the management of the firm must monitor this factor closely. Because this factor is a supporting factor for the financial performance, the companies must get more premiums to generate more income and more profit. The greater premium growth will translate into greater financial performance. The management must closely monitor and evaluate this factor and associate it with positive impact factors that it could boost and the risk factor that it could cause to damage the financial performance. The management needs to make the premium growth better and lower the minimum risk factor.

- The volume of capital had a positive and significant impact on the financial performance of insurance companies in Cambodia. This means a quantity of capital is a significant measurement of the economic strength of an insurance company and states the capacity of the present capital to promote the further development of assets. A firm with strong capital will benefit from using its capital wisely in a competitive market.
- The GDP had a positive and significant impact on the financial performance of insurance companies in Cambodia. This means the GDP is a measure of the country's overall economic performance. As the economy grows, so does the possibility of selling insurance policies, and insurance companies are likely to gain in the form of larger earnings. GDP is one of the macroeconomic factors that companies can't control, but that has a significant positive effect on their financial performance. The management needs to keep a close eye on it.
- Liquidity had an insignificant and negative relationship with ROA and ROE, the financial performance of insurance companies in Cambodia. As a result, insurance companies should consider investing their idle capital in a variety of industries, diversifying their investment portfolio, and asking for investment from the government (insurance regulator) in accordance with the legislation governing insurance company investment regulations. Under this investment rule, insurance companies must request investment from the government on a case-by-case basis. As a result, insurance companies should appropriately follow this instruction by establishing and executing appropriate investment portfolio management that can boost their returns.
- Underwriting risk had a significant negative impact on ROA and ROE, the financial performance of insurance companies in Cambodia. As a result, insurance companies should think about reducing their costs and claims by using suitable estimation pricing and valuation procedures that consider the risk of certain industries and catastrophic occurrences. To comply with this, businesses must charge a suitable premium for insurance plans with substantial insurance coverage. Furthermore, insurance companies should provide sufficient diversity in their insurance policy portfolios to increase premium earnings and compensate for any losses that may arise. This is a factor that insurance companies should know about so that the risk of underwriting doesn't hurt their finances.

- Inflation has a negative relationship with ROA and ROE. It is significant with ROA and insignificant with ROE, the financial performance of insurance companies in Cambodia. Underwriting risk has a negative relationship and is significant with respect to ROA and ROE, the financial performance of insurance companies in Cambodia. Insurance companies should closely monitor the inflation of health treatment, health checkups, and other factors on a regular basis. As a result, the claim and the underwriting may be increased.

### **3.3.2.3. Implications for Literature and Academic Researchers**

This research is a useful reference for future research, especially relating to the insurance sector. First, the research was confined to the insurance sector, and the results can't be generalized to other sectors. Hence, future research can be carried out to expand coverage to incorporate other sectors to have a comprehensive view of financial performance in Cambodia. Comparative research on this issue can also be carried out between developed and developing countries. Here, cultural differences among developing and developed countries that influence the perceptions of knowledge sharing practices, especially the concept of organizational culture, should be considered to generalize or modify the concepts. Hence, future research may apply different measurement methods. If enough literature is found, future research can look at both the financial and non-financial performance aspects of performance in the insurance sector and the factors that affect them separately to learn more about each part.

### **3.4. Summary of the chapter**

This chapter is a discussion chapter that discusses the findings of research, summarizes the findings, recommends the findings, and implicates the research. The discussion of the research findings starts with a direct answer to the research question and explains how the results for Cambodia differ from other countries, explaining why this might be the case and also what this means for managers. Besides that, the research will discuss the microeconomic and macroeconomic factors that impact on financial performance, which are indicated by ROA and ROE. The summary of the findings contributes to the insurance company's maximum return on its capital, improving the financial performance management of the insurance companies, which was a significant contributor to the country's economic development. This finding will contribute to the main objective of the research. The conclusion of this finding is that models of the financial performance of insurance companies in Cambodia have been created. At the same time, the

research had given the recommendation to top management, middle management, local management, and the researcher for their references. The research findings and implications have made contributions and suggestions to policymakers in the theoretical and practical realms. It adds to the knowledge about the subject by giving more evidence to support or disprove previous research findings, suggesting better ways to do things in practice for policymakers, regulators, insurers' management, researchers, and academics. The last part of the research is the conclusion.

## CONCLUSION

The econometric regression analysis of the fixed-effect model revealed that independent variables including company size, leverage, the volume of capital, premium growth, underwriting risk, and GDP had a significant effect in explaining the ROA and ROE of the financial performance of insurance companies in Cambodia. The inflation variable was statistically significant with the dependent variable ROA, but it was insignificant with ROE. Contrary to what the researcher thought, liquidity has no effect on how well insurance companies in Cambodia do financially.

Specifically, the research results show that company size, leverage, premium growth, the volume of capital, and GDP were positively associated with the financial performance of insurance companies, whereas liquidity, underwriting risk, and inflation were negatively correlated with the financial performance of insurance companies. Hence, those insurance companies with larger company size, higher leverage, higher premium growth, higher volume of capital, lower liquidity, and lower underwriting risk have better insurer financial performance in Cambodia. However, company size, leverage, premium growth, the volume of capital, and GDP have a positive correlated and statistically significant relationship between ROA and ROE in the financial performance of insurance companies in Cambodia. Underwriting risk has a negative correlation but a statistically significant relationship with the financial performance of insurance companies in Cambodia, which is measured by ROA and ROE. As a result, liquidity has a negatively correlated and statistically insignificant relationship with the financial performance of insurance companies in Cambodia, which is measured by ROA and ROE. Inflation has a negative impact on the ROA, but it has no impact on the ROE of the financial performance of Cambodian insurance companies. Overall, the financial performance of insurance companies in Cambodia, which is measured by ROA and ROE, is not affected by liquidity and inflation.

This research concludes that the most significant factors in the financial performance of insurance companies in Cambodia are company size, leverage, premium growth, capital volume, underwriting risk, liquidity, and the macroeconomic factors GDP and inflation. These findings suggest that policymakers, insurance regulators, and insurance companies ought to focus on these factors when seeking to improve the situation of Cambodian insurers. Further studies could extend this research and add additional factors such as investment variables, interest rate variables, and other variables (Chen et al., 2004, Papadogonas et al., 2009, Mwangi et al., 2013, Mirie et al.,

2015). Also, we need further research to better understand how regulators and insurance companies can expand the channel of distribution. Some promising venues could be to develop more individually tailored products in order to extend the coverage to maintain financial stability and economic growth (Ben Dhiab and Jouili, 2015; Din, Abu-Bakar, and Regupathi, 2017; Apergis and Poufinas, 2020; Zulfiqar, Mohy-UI-Din, Abu-Rumman, Al-Shraah, and Ahmed, 2020). Bancassurance and digitalization efforts are some intuitive suggestions.

Hence, this study is a first step to better understanding the factors of Cambodian insurers' financial success and will hopefully help to contribute to creating the right products to protect and save people from future financial losses. In the Cambodian context, the government, regulators, and insurance companies, and it is especially important for the poor and those who are most vulnerable, because it allows them to prevent individuals from losing financial stability. It will also allow for improvements for companies and the country, enabling them to maintain financial stability and economic growth. To reduce inequalities and maintain financial stability, policymakers, insurance regulators, and insurance companies should promote insurance to everyone and all people in the country, independent of individual markers such as sex, age, disability, race, class, ethnicity, religion, and opportunity. Besides that, the insurance industry provides more jobs for people to reduce unemployment and stimulate economic growth. At the same time, the insurance regulator and the insurance companies need to do more public awareness to get trust from the public and add the insurance program into the high school curriculum for students and young people.

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## APPENDIX A

### List of insurance companies in Cambodia 2019

No.	Company Name
GENERAL INSURANCE COMPANIES:	
1.	CAMPU LONPAC INSURANCE Plc.
2.	ASIA INSURANCE (CAMBODIA) Plc.
3.	INFINITY GENERAL INSURANCE Plc.
4.	FORTE INSURANCE (CAMBODIA) Plc.
5.	CAMBODIA NATIONAL INSURANCE COMPANY
6.	PEOPLE & PARTNERS INSURANCE Plc.
7.	CAMBODIA-VIETNAM INSURANCE Plc.
8.	PHILLIP GENERAL INSURANCE (CAMBODIA) Plc.
9.	EAST INSURANCE Plc.
10.	ETIQA GENERAL INSURANCE (CAMBODIA) Plc.
11.	LY HOUR INSURANCE Plc.
12.	NEWA INSURANCE (CAMBODIA) Plc.
13.	DARA INSURANCE Plc.
14.	CB GENERAL INSURANCE Plc.
15.	PROSUR MICRO INSURANCE Plc.
16.	EVERCARE GENERAL INSURANCE COMPANY Plc.
LIFE INSURANCE COMPANIES:	
1.	CAMBODIA LIFE INSURANCE COMPANY Plc.
2.	MANULIFE (CAMBODIA) Plc.
3.	PRUDENTIAL (CAMBODIA) LIFE ASSURANCE Plc.
4.	SOVANNAPHUM LIFE ASSURANCE Plc.
5.	BANGKOK LIFE ASSURANCE (CAMBODIA) Plc.
6.	AIA (CAMBODIA) LIFE INSURANCE Plc.
7.	GRAND CHINA LIFE INSURANCE Plc.
8.	DAI-ICHI LIFE INSURANCE (CAMBODIA) Plc.
9.	PHILLIP LIFE ASSURANCE (CAMBODIA) Plc.
10.	H.K YUE TAI LIFE INSURANCE Plc.
11.	FORTE LIFE ASSURANCE (CAMBODIA) Plc.
12.	ETIQA LIFE INSURANCE (CAMBODIA) Plc.

**MICRO INSURANCE COMPANIES:**

1. CAMBODIA PEOPLE MICRO INSURANCE Plc.
2. MILVIK (CAMBODIA) MICRO INSURANCE Plc.
3. PREVOIR (KAMPUCHEA) MICRO LIFE INSURANCE Plc.
4. MEDA RABRONG Plc.
5. MEKONG MICROINSURANCE Plc.
6. H.I MICRO-INSURANCE Plc.

## APPENDIX B

**Table 2-3a: Multiple Linear Regression for ROA**

Panel Least Squares method, sample (2009-2019), Periods include 11,  
143 observations across 13 Cross-sections

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-20.98917	9.477805	-2.214560	0.0286
CS	1.163154	0.549757	2.115759	0.0364
LEV	0.079876	0.014307	5.582969	0.0000
PGR	0.041557	0.011874	3.499713	0.0007
VOC	0.064426	0.012715	5.066920	0.0000
<b>LIQ</b>	<b>-0.016995</b>	<b>0.009215</b>	<b>-1.844202</b>	<b>0.0676</b>
UWR	-0.078882	0.012995	-6.070286	0.0000
GDP	0.492696	0.114520	4.302268	0.0000
INF	-0.382723	0.142932	-2.677662	0.0084

### Specification of Effects

Cross-section fixed (variables of dummy)

R <sup>2</sup>	0.741025	Var. of dependent on mean	4.368462
R <sup>2</sup> (Adjusted)	0.698570	Var. of dependent on S.D.	2.921968
Regression of S.E.	1.604238	Info. criterion of Akaike	3.918058
Resid. of sum squared	313.9769	Criterion of Schwarz	4.353161
Probability logarithmic	-259.1412	Criterion of Hannan-Quinn	4.094863
F-statistic	17.45436	Stat of Durbin-Watson	1.503190
Prob. (F-statistic)	0.000000		

**Table 2-4: Multiple Linear Regression for ROE**

Panel Least Squares method, sample (2009-2019), Periods include 11,  
143 observations across 13 Cross-sections

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-56.34538	14.63036	-3.851264	0.0002
CS	3.423261	0.848630	4.033868	0.0001
LEV	0.177816	0.022085	8.051351	0.0000
PGR	0.084909	0.018330	4.632272	0.0000
VOC	0.042917	0.019627	2.186562	0.0307
LIQ	-0.027480	0.014225	-1.931789	0.0557
UWR	-0.124814	0.020059	-6.222236	0.0000
GDP	0.501464	0.176778	2.836686	0.0053
<b>INF</b>	<b>-0.332670</b>	<b>0.220636</b>	<b>-1.507779</b>	<b>0.1342</b>

### Specification of Effects

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Cross-section fixed (variables of dummy)			
R <sup>2</sup>	0.750437	Var. of dependent on mean	6.543776
R <sup>2</sup> (Adjusted)	0.709525	Var. of dependent on S.D.	4.594748
Regression of S.E.	2.476374	Info. criterion of Akaike	4.786350
Resid. of sum squared	748.1561	Criterion of Schwarz	5.221453
Probability logarithmic	-321.2240	Criterion of Hannan-Quinn	4.963155
F-statistic	18.34271	Stat of Durbin-Watson	1.294530
Prob. (F-statistic)	0.000000		

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**Table 2-6: Variance Inflation Factor for ROA**

Sample 1 143, 143 observations.

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Var.	Coef. Var.	Uncentered VIF	Centered VIF
C	24.02102	1004.033	NA
CS	0.076700	887.1802	1.484778
LEV	0.000103	4.148208	1.655497
PGR	0.000152	2.624319	1.260943
VOC	0.000156	31.68606	1.827165
LIQ	3.73E-05	6.344996	1.034754
UWR	0.000153	5.239933	1.211704
GDP	0.012999	24.48835	2.233578
INF	0.021339	8.747144	2.028611

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**Table 2-7: Variance Inflation Factor for ROE**

Sample 1 143, 143 observations.

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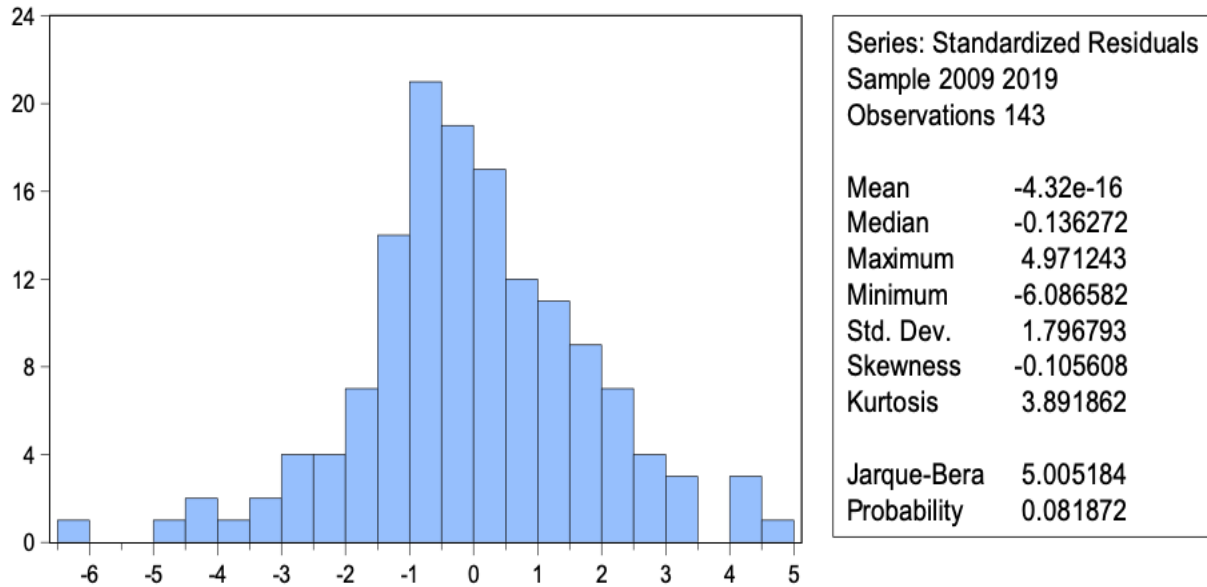
Var.	Coef. Var.	Uncentered VIF	Centered VIF
C	59.49713	1004.033	NA
CS	0.189976	887.1802	1.484778
LEV	0.000254	4.148208	1.655497
PGR	0.000377	2.624319	1.260943
VOC	0.000386	31.68606	1.827165
LIQ	9.23E-05	6.344996	1.034754
UWR	0.000378	5.239933	1.211704
GDP	0.032197	24.48835	2.233578
INF	0.052854	8.747144	2.028611

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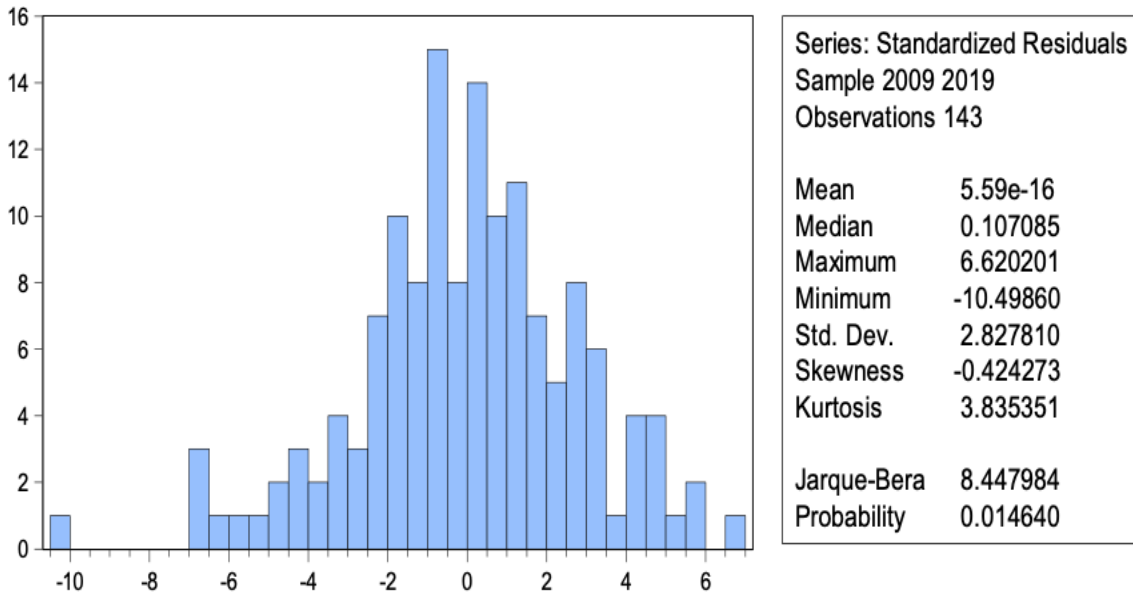


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**Table 2-8 and graph 2-1: the result of Jarque-Bera normality test (Return on Assets)**



**Table 2-9 and graph 2-2: the result of Jarque-Bera normality test (Return on Equities)**



**Table 2-10: Heteroscedasticity tested by Breusch-pagan/cook-Weisberg test (ROA)**

Test of Heteroskedasticity: Test of Breusch-Pagan-Godfrey for ROA

F-statistic	2.946094	Probability F (8,134)	0.0046
Observations*R <sup>2</sup>	21.38959	Probability Chi-Square (8)	0.0062
Scaled explained SS	27.15737	Probability Chi-Square (8)	0.0007

Least Squares method, sample 1 143, 143 observation.

Var.	Coef.	S. E.	t-Stat.	Prob.
C	11.79189	13.76183	0.856855	0.3931
CS	-0.796546	0.777637	-1.024316	0.3075
LEV	0.012972	0.028446	0.456016	0.6491
PGR	0.036466	0.034661	1.052054	0.2947
VOC	0.103933	0.035045	2.965706	0.0036
LIQ	-0.033209	0.017138	-1.937739	0.0548
UWR	-0.004204	0.034687	-0.121191	0.9037
GDP	-0.367355	0.320135	-1.147500	0.2532
INF	0.424574	0.410175	1.035105	0.3025
R <sup>2</sup>	0.149578	Var. of dependent on mean		3.205887
R <sup>2</sup> (Adjusted)	0.098806	Var. of dependent on S.D.		5.470927
Regression of S.E.	5.193619	Info. Criterion of Akaike		6.193608
Resid. of sum squared	3614.472	Criterion of Schwarz		6.380080
Probability logarithmic	-433.8430	Criterion of Hannan-Quinn		6.269381
F-statistic	2.946094	Stat of Durbin-Watson		1.791480
Prob. (F-statistic)	0.004580			

**Table 2-11: Heteroscedasticity tested by Breusch-pagan/cook-Weisberg test (ROE)**

Test of Heteroskedasticity: Test of Breusch-Pagan-Godfrey for ROE

F-statistic	2.745963	Probability. F (8,134)	0.0077
Observations*R <sup>2</sup>	20.14123	Probability Chi-Square (8)	0.0098
Scaled explained SS	25.07266	Probability Chi-Square (8)	0.0015

Least Squares method, sample 1 143, 143 observations.

Var.	Coef.	S. E.	t-Stat.	Prob.
C	64.44895	33.92445	1.899779	0.0596
CS	-2.904875	1.916964	-1.515352	0.1320
LEV	0.080467	0.070123	1.147501	0.2532
PGR	-0.003457	0.085444	-0.040460	0.9678
VOC	0.014722	0.086390	0.170415	0.8649
LIQ	-0.109810	0.042247	-2.599232	0.0104
UWR	0.115068	0.085507	1.345712	0.1807
GDP	-1.790148	0.789170	-2.268394	0.0249
INF	1.408836	1.011127	1.393332	0.1658
R <sup>2</sup>	0.140848	Var. of dependent on mean		7.940590
R <sup>2</sup> (Adjusted)	0.089555	Var. of dependent on S.D.		13.41776
Regression of S.E.	12.80286	Info. Criterion of Akaike		7.998083
Resid. of sum squared	21964.36	Criterion of Schwarz		8.184556
Probability logarithmic	-562.8629	Criterion of Hannan-Quinn		8.073857
F-statistic	2.745963	Stat of Durbin-Watson		1.774172
Prob. (F-statistic)	0.007729			

Table 2-12: Autocorrelation and partial autocorrelations by correlogram-Q-statistic test (ROA)

Sample: 1 143, 143 observations.

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
. ***	***	1	0.366	0.366	19.583	0.000
. **	*	2	0.275	0.163	30.743	0.000
. *	.	3	0.133	-0.014	33.354	0.000
. .	* .	4	-0.038	-0.143	33.571	0.000
. .	.	5	-0.044	-0.017	33.866	0.000
. .	* .	6	0.022	0.100	33.939	0.000
. *	* .	7	0.094	0.116	35.288	0.000
. *	.	8	0.132	0.056	37.974	0.000
. *	.	9	0.166	0.053	42.232	0.000
. *	.	10	0.112	-0.009	44.186	0.000
. *	* .	11	0.142	0.090	47.338	0.000
. .	* .	12	-0.019	-0.108	47.396	0.000
. .	.	13	-0.039	-0.039	47.638	0.000
* .	.	14	-0.072	-0.038	48.464	0.000
. .	.	15	-0.059	0.011	49.031	0.000
* .	* .	16	-0.112	-0.114	51.077	0.000
* .	* .	17	-0.165	-0.169	55.576	0.000
* .	* .	18	-0.174	-0.116	60.580	0.000
** .	* .	19	-0.221	-0.111	68.780	0.000
* .	.	20	-0.133	0.015	71.781	0.000
* .	.	21	-0.140	-0.057	75.131	0.000
. .	* .	22	0.029	0.123	75.276	0.000
. .	.	23	-0.031	-0.029	75.441	0.000
. .	.	24	-0.038	-0.022	75.689	0.000
* .	.	25	-0.095	-0.051	77.284	0.000
* .	.	26	-0.171	-0.053	82.467	0.000
** .	.	27	-0.223	-0.054	91.324	0.000
** .	* .	28	-0.258	-0.088	103.30	0.000
* .	.	29	-0.192	-0.040	109.99	0.000
. .	* .	30	-0.026	0.133	110.12	0.000
. .	.	31	0.020	-0.002	110.19	0.000
. .	.	32	0.033	-0.038	110.40	0.000
. *	* .	33	0.174	0.115	116.08	0.000
. .	.	34	0.008	-0.047	116.09	0.000
. *	* .	35	0.105	0.151	118.19	0.000
. .	* .	36	-0.015	-0.076	118.23	0.000

Table 2-13 Autocorrelation and partial autocorrelations by correlogram-Q-statistic test (ROE)



Sample: 1 143, 143 observations

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
. ***	. ***	1	0.376	0.376	20.591	0.000
. **	. *	2	0.258	0.136	30.378	0.000
. *	. .	3	0.099	-0.043	31.824	0.000
. .	* .	4	-0.039	-0.112	32.054	0.000
* .	. .	5	-0.094	-0.065	33.385	0.000
* .	. .	6	-0.092	-0.010	34.669	0.000
. .	. *	7	0.004	0.094	34.672	0.000
. .	. .	8	-0.011	-0.019	34.690	0.000
. .	. .	9	0.072	0.060	35.488	0.000
. .	* .	10	-0.013	-0.088	35.514	0.000
. .	. .	11	-0.043	-0.055	35.805	0.000
** .	** .	12	-0.216	-0.211	43.194	0.000
* .	. *	13	-0.100	0.086	44.776	0.000
* .	. .	14	-0.107	-0.005	46.626	0.000
. .	. *	15	-0.002	0.088	46.627	0.000
. .	* .	16	-0.005	-0.076	46.631	0.000
. .	. .	17	-0.015	-0.060	46.669	0.000
. .	* .	18	-0.043	-0.094	46.976	0.000
* .	. .	19	-0.072	0.006	47.839	0.000
. .	. *	20	0.041	0.126	48.118	0.000
. .	. .	21	-0.062	-0.040	48.776	0.001
. *	. *	22	0.112	0.126	50.942	0.000
. .	* .	23	0.040	-0.075	51.217	0.001
. .	* .	24	0.022	-0.112	51.302	0.001
. .	* .	25	-0.059	-0.097	51.921	0.001
* .	. .	26	-0.079	-0.007	53.030	0.001
* .	* .	27	-0.183	-0.090	59.010	0.000
** .	* .	28	-0.259	-0.140	71.115	0.000
* .	* .	29	-0.189	-0.086	77.598	0.000
* .	. .	30	-0.128	-0.021	80.622	0.000
. .	. .	31	-0.060	-0.052	81.280	0.000
. .	. .	32	-0.052	-0.012	81.788	0.000
. .	. .	33	0.051	0.030	82.286	0.000
. .	. .	34	-0.036	-0.017	82.529	0.000
. *	. *	35	0.084	0.090	83.892	0.000
. .	. .	36	0.065	0.029	84.701	0.000



**Table 2-14 Autocorrelation by Serial Correlation LM test for ROA**

The Breusch-Godfrey Test

F-statistic	16.77707	Probability F (2,132)	0.0000
Observations*R <sup>2</sup>	28.98292	Probability Chi-Square (2)	0.0000

Least Squares method, sample 1 143, 143 observations

Missing value lag residuals of presample are set to 0.

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-0.573943	4.421627	-0.129804	0.8969
CS	-0.053546	0.250460	-0.213789	0.8310
LEV	0.005454	0.009189	0.593466	0.5539
PGR	0.014747	0.011447	1.288293	0.1999
VOC	0.010919	0.011388	0.958827	0.3394
LIQ	0.003151	0.005522	0.570616	0.5692
UWR	0.019247	0.011605	1.658481	0.0996
GDP	-0.106005	0.105638	-1.003476	0.3175
INF	0.139453	0.135268	1.030933	0.3045
RESID (-1)	0.397905	0.091335	4.356549	0.0000
RESID (-2)	0.206771	0.087622	2.359820	0.0197
R <sup>2</sup>	0.202678	Var. of dependent on mean		1.78E-15
R <sup>2</sup> (Adjusted)	0.142275	Var. of dependent on S.D.		1.796793
Regression of S.E.	1.664072	Info. criterion of Akaike		3.930216
Resid of sum squared	365.5259	Criterion of Schwarz		4.158127
Probability logarithmic	-270.0104	Criterion of Hannan-Quinn		4.022828
F-statistic	3.355414	Stat of Durbin-Watson		1.840587
Prob. (F-statistic)	0.000638			

**Table 2-15 Test of Autocorrelation by Serial Correlation LM for ROE**

The Breusch-Godfrey Test

F-statistic	15.36787	Probability F (2,132)	0.0000
Observations*R <sup>2</sup>	27.00827	Probability Chi-Square (2)	0.0000

Least Squares methods, sample 1 143, 143 observations

Missing value lag residuals of presample are set to 0.

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-2.088211	7.009558	-0.297909	0.7662
CS	0.002328	0.395647	0.005885	0.9953
LEV	0.013130	0.014687	0.893960	0.3730
PGR	0.020599	0.018059	1.140706	0.2561
VOC	0.015650	0.018055	0.866795	0.3876
LIQ	0.003293	0.008758	0.376035	0.7075
UWR	0.019377	0.017985	1.077424	0.2833

GDP	-0.141723	0.167322	-0.847009	0.3985
INF	0.215750	0.214378	1.006399	0.3161
RESID (-1)	0.392211	0.090759	4.321475	0.0000
RESID (-2)	0.161202	0.087716	1.837771	0.0683
R <sup>2</sup>	0.188869	Var. of dependent on mean		-2.61E-16
R <sup>2</sup> (Adjusted)	0.127420	Var. of dependent on S.D.		2.827810
Regression of S.E.	2.641514	Info. criterion of Akaike		4.854385
Resid. of Sum squared	921.0427	Criterion of Schwarz		5.082296
Probability logarithmic	-336.0885	Criterion of Hannan-Quinn		4.946997
F-statistic	3.073574	Stat of Durbin-Watson		1.909818
Prob. (F-statistic)	0.001530			

**Table 2-16 Test of Autocorrelation by DW test for ROA**

Test of Heteroskedasticity: DW

F-statistic	2.745963	Probability F (8,134)	0.0077
Observations*R <sup>2</sup>	20.14123	Probability Chi-Square (8)	0.0098
Scaled explained SS	25.07266	Probability Chi-Square (8)	0.0015

Equation Test: Least squares methods, sample 1 143, 143 observations

Var.	Coef.	S. E.	t-Stat.	Prob.
C	64.44895	33.92445	1.899779	0.0596
CS	-2.904875	1.916964	-1.515352	0.1320
LEV	0.080467	0.070123	1.147501	0.2532
PGR	-0.003457	0.085444	-0.040460	0.9678
VOC	0.014722	0.086390	0.170415	0.8649
LIQ	-0.109810	0.042247	-2.599232	0.0104
UWR	0.115068	0.085507	1.345712	0.1807
GDP	-1.790148	0.789170	-2.268394	0.0249
INF	1.408836	1.011127	1.393332	0.1658
R <sup>2</sup>	0.140848	Var of dependent on mean		7.940590
R <sup>2</sup> (Adjusted)	0.089555	Var of dependent on S.D.		13.41776
Regression of S.E.	12.80286	Info. criterion of Akaike		7.998083
Resid Sum squared	21964.36	Criterion of Schwarz		8.184556
Probability logarithmic	-562.8629	Criterion of Hannan-Quinn		8.073857
F-statistic	2.745963	Stat of Durbin-Watson		1.774172
Prob. (F-statistic)	0.007729			

**Table 2-17: Test of Autocorrelation by DW test for ROE**

Test of Heteroskedasticity: DW

F-statistic	2.946094	Prob. F (8,134)	0.0046
Obs*R-squared	21.38959	Prob. Chi-Square (8)	0.0062
Scaled explained SS	27.15737	Prob. Chi-Square (8)	0.0007

Equation Test: Least Squares method, sample 1 143 and 143 observation

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-11.58832	7.713438	-1.502355	0.1354
CS	0.865462	0.435862	1.985633	0.0491
LEV	0.091570	0.015944	5.743257	0.0000
PGR	0.077497	0.019428	3.989035	0.0001
VOC	0.036072	0.019643	1.836419	0.0685
LIQ	-0.025581	0.009606	-2.663131	0.0087
UWR	-0.169924	0.019442	-8.740118	0.0000
GDP	0.856413	0.179434	4.772846	0.0000
INF	-0.639068	0.229901	-2.779752	0.0062

R-squared	0.621229	Var. of dependent on mean	6.543776
R <sup>2</sup> (Adjusted)	0.598616	Var. of dependent on S.D.	4.594748
Regression of S.E.	2.910999	Info. criterion of Akaike	5.035739
Resid of sum squared	1135.504	Criterion of Schwarz	5.222211
Probability logarithmic	-351.0553	Criterion of Hannan-Quinn	5.111512
F-statistic	27.47194	Stat of Durbin-Watson	1.241446
Prob. (F-statistic)	0.000000		

**Table 2-18: Random Effects of Correlated – Test of Hausman for ROA**

Random Effects of Correlated – Test of Hausman  
The Random Effects Test in Cross-Section

Summary Test	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	8	1.0000

\* The cross-section variance test is ineffective. The Hausman statistic has been set to 0.

\*\* WARNING: The cross-section random effects variance is predicted to be 0.

Comparisons of cross-section random effects tests:

Var.	Fixed	Random	Var (Diff.)	Prob.
CS	1.163154	0.261760	0.244536	0.0683
LEV	0.079876	0.041549	0.000127	0.0007
PGR	0.041557	0.029360	0.000026	0.0175
VOC	0.064426	0.061615	0.000044	0.6734
LIQ	-0.016995	-0.020442	0.000057	0.6477

UWR	-0.078882	-0.104912	0.000054	0.0004
GDP	0.492696	0.621103	0.003336	0.0262
INF	-0.382723	-0.460112	0.004377	0.2421

ROA test equation for Cross-section random effects Panel Least Square  
Sample (2009-2019). Periods include 11  
143 observations across 13 Cross-sections

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-20.98917	9.477805	-2.214560	0.0286
CS	1.163154	0.549757	2.115759	0.0364
LEV	0.079876	0.014307	5.582969	0.0000
PGR	0.041557	0.011874	3.499713	0.0007
VOC	0.064426	0.012715	5.066920	0.0000
LIQ	-0.016995	0.009215	-1.844202	0.0676
UWR	-0.078882	0.012995	-6.070286	0.0000
GDP	0.492696	0.114520	4.302268	0.0000
INF	-0.382723	0.142932	-2.677662	0.0084

Specification of Effects

Fixed cross-section (variables of dummy)

R <sup>2</sup>	0.741025	Var. of dependent on mean	4.368462
R <sup>2</sup> (Adjusted)	0.698570	Var. of dependent on S.D.	2.921968
Regression of S.E.	1.604238	Info. criterion of Akaike	3.918058
Resid sum squared	313.9769	Criterion of Schwarz	4.353161
Probability logarithmic	-259.1412	Criterion of Hannan-Quinn	4.094863
F-statistic	17.45436	Stat of Durbin-Watson	1.503190
Prob. (F-statistic)	0.000000		

**Table 2-19: Random Effects of Correlated - Test of Hausman for ROE**

Random Effects of Correlated – Test of Hausman  
Random effects test in cross-section

Summary Test	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	8	1.0000

\* The cross-section variance test is ineffective. The Hausman statistic has been set to 0.

Comparisons of cross-section random effects tests:

Var.	Fixed	Random	Var (Diff.)	Prob.
CS	3.423261	1.181750	0.471321	0.0011
LEV	0.177816	0.108127	0.000236	0.0000
PGR	0.084909	0.086698	0.000035	0.7622

VOC	0.042917	0.039645	0.000070	0.6953
LIQ	-0.027480	-0.025775	0.000093	0.8598
UWR	-0.124814	-0.161359	0.000085	0.0001
GDP	0.501464	0.797113	0.006360	0.0002
INF	-0.332670	-0.611961	0.008246	0.0021

ROE test equation for Cross-section random effects Panel Least Square,  
Sample (2009-2019). Periods include 11  
143 observations across 13 Cross-sections

Var.	Coef.	S. E.	t-Stat.	Prob.
C	-56.34538	14.63036	-3.851264	0.0002
CS	3.423261	0.848630	4.033868	0.0001
LEV	0.177816	0.022085	8.051351	0.0000
PGR	0.084909	0.018330	4.632272	0.0000
VOC	0.042917	0.019627	2.186562	0.0307
LIQ	-0.027480	0.014225	-1.931789	0.0557
UWR	-0.124814	0.020059	-6.222236	0.0000
GDP	0.501464	0.176778	2.836686	0.0053
INF	-0.332670	0.220636	-1.507779	0.1342

#### Specification of Effects

Fixed cross-section (variables of dummy)

R <sup>2</sup>	0.750437	Var. of dependent on mean	6.543776
R <sup>2</sup> (Adjusted)	0.709525	Var. of dependent on S.D.	4.594748
Regression of S.E.	2.476374	Info. criterion of Akaike	4.786350
Resid sum squared	748.1561	Criterion of Schwarz	5.221453
Probability logarithmic	-321.2240	Criterion of Hannan-Quinn	4.963155
F-statistic	18.34271	Stat of Durbin-Watson	1.294530
Prob. (F-statistic)	0.000000		

## APPENDIX C

### 1. Resource-Based View Theory

Wernerfelt came up with the resource-based theory in 1984, and he used it to show how well an organization manages its resources. Using a resource-based perspective of a company, Mahoney and Pandian (1992) say that when a company manages its resources well, it can build a long-term competitive advantage. This is called a "competitive barrier." According to the notion, it is far more possible to take advantage of external chances by repurposing existing resources rather than having to learn new abilities for each opportunity. Through efficient administration and usage of its available resources, the company may achieve competitive advantage.

The resource-based view, according to Wanjugu (2014), assumes that some unique existing strategic resources would cause superior performance and, as a result, a competitive advantage. The capacity of competitors to exploit precious, uncommon, inimitable, and non-substitutable resources will decide the durability of such an advantage. It's critical to understand that valuable, uncommon, one-of-a-kind, and non-replaceable resources aren't wholly unchangeable. However, because of the volatility of today's markets, a firm's existing resources may not meet future market demands. To meet future market competition, it is critical to alter and develop resources.

How a company can build and keep its competitive advantage is explained by a corporation's resource-based perspective (Mahoney et al. 1992).

The theory suggested by the research is that the resources at the insurance companies are an enormous determinant of how they perform. In fact, faced with fundamental, volatile changes in the environment, value, rarity, inimitability, and non-substitutability have increased. RBV states have their own invaluable attributes. Because the need for planning and expenditure to develop such resources are external factors, the RBV may exaggerate the profitability of enterprises using these resources because the expense of acquisition and accumulation is avoided. The managers at the insurance companies should ensure full maximization of their available resources for them to perform financially. They should also ensure that they possess resources that are unique to them and that are not easily imitated by their competitors in the insurance sector (Kollie, 2017).

This research assumes that each organization has unique resources compared to its competitors. This is not usually the case, as organizations tend to imitate the resources of their competitors, thus limiting the competitive advantages obtained. The theory's implication for the research is that the available resources at the insurance companies are a huge determinant in how they perform. As such, the managers at the insurance companies should ensure full maximization of their available resources in order for them to perform financially. They should also ensure that they possess resources that are unique to them and that are not easily mimicked by their competitors in the insurance sector.

## **2. Economic Growth Theory**

Schumpeter's (1934) theory of economic growth is based on the idea that private property, a competitive market, and efficient financial systems could all lead to new ideas. These prerequisites are frequently not met in countries without a democratic structure. As a result, Schumpeter's theory applies to countries that are democratic and economically developed.

Lewis (1954) addressed a wealthy labor force rather than that of an impoverished country. Lewis agreed with classical economists' general vision but did not always agree with their diagnosis and techniques. Lewis's model predicts that, in the short term, life will be kept at a low level. The savings obtained will enhance the stock of capital, resulting in the emergence of income growth in the long-term expansion. Lewis's model predicts that in the short run, inequalities between countries must widen for income levels to equalize over the long haul (Lewis 1956).

Simon Kuznets devised "Kuznets' curve" as a theoretical foundation for Lewis' concept (Kuznets, 1955). According to empirical studies, economic inequities emerge in the early stages of expansion. When workers left farms for industry, the disparities were the most pronounced. When the factors of production were concentrated in industrial hubs, inequities were eliminated. Kuznets (1976) discovered a link between economic development dynamics and the increasing proportion of people living in cities.

Lewis's theory incorporates several difficult-to-accept assumptions. Poverty cannot be put off until some undefined time in the future. After all, increasing capital accumulation would benefit by reducing spending, which would disproportionately disadvantage the poorest individuals.

A few years later, Walt Rostow proposed a new theory of economic growth. Rostow, like Lewis, thought that capital accumulation was necessary for economic progress and established five

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stages of development (Rostow, 1960). Rostow, attaining the third stage, known as "take off," is the most difficult task for poor countries. The break of the "vicious circle" that developed over time is a concern for poor countries. Rostow advocated that it be broken by amassing wealth. He was well aware, however, that if internal accumulation did not improve, foreign assistance would be necessary. Rostow, shifting the economy from rural to industrial would allow economic growth to spread across the country. When Rostow talked about the sixth stage of economic growth in 1971, he used the word "quality" to describe it. This stage is when goods and services keep getting better and better.

## APPENDIX D

**Table 3-1: Summary and comparison of expected and actual hypothesis result**

<b>Independent Variable</b>	<b>Expected hypothesis</b>	<b>Actual hypothesis</b>	<b>Statistical test</b>	<b>Status of hypothesis</b>	<b>Dependent Variable</b>
<b>CS</b>	+	+	Sig.	Fail to reject	<b>ROA</b>
<b>LEV</b>	+	+	Sig.	Fail to reject	
<b>PGR</b>	+	+	Sig.	Fail to reject	
<b>VOC</b>	+	+	Sig.	Fail to reject	
<b>LIQ</b>	-	-	Insig.	Reject	
<b>UWR</b>	-	-	Sig.	Fail to reject	
<b>GDP</b>	+	+	Sig.	Fail to reject	
<b>INF</b>	-	-	Sig.	Fail to reject	
<b>CS</b>	+	+	Sig.	Fail to reject	<b>ROE</b>
<b>LEV</b>	+	+	Sig.	Fail to reject	
<b>PGR</b>	+	+	Sig.	Fail to reject	
<b>VOC</b>	+	+	Sig.	Fail to reject	
<b>LIQ</b>	-	-	Insig.	Reject	
<b>UWR</b>	-	-	Sig.	Fail to reject	
<b>GDP</b>	+	+	Sig.	Fail to reject	
<b>INF</b>	-	-	Insig.	Reject	

Noted: positive: +, negative: -, significant: Sig., insignificant: Insig.

## APPENDIX E

### Explanatory Diagnosis for 12 General Insurance Companies

#### 1. Descriptive Statistics

In this section, the researcher provides descriptive statistics for the "dependent and independent variables" used in the study for testing 12 general insurance companies. The dependent variable is "the financial performance of the insurance companies" as measured by ROA and ROE. The explanatory variables are company size, leverage, premium growth, volume of capital, underwriting risk, liquidity, GDP, and inflation. Between 2009 and 2019, twelve general insurance companies provided 132 observations for the dependent and independent variables. All the research variables' "mean, maximum, minimum, and standard deviation" were gathered as overall descriptive statistics for the study. Table 2-20, provided an overview of the descriptive statistics findings, including the mean, standard deviation, maximum, and minimum of all variables, as indicated below:

The mean of ROA and ROE for twelve general insurance companies in the last eleven years was +4.41 and +6.59, respectively. This means that, on average, insurance companies in Cambodia earned +4.41 and +6.59 units of their total assets and total equity. The minimum values of ROA and ROE are -3.56 and -7.61, respectively, and a maximum value of +11.97 and +16.18.

The first explanatory variable is company size, which has an average mean value of +16.65, which is an average of the maximum and minimum, which are +18.95 and +15.64, respectively. The standard deviation as a percentage is +0.68.

Leverage ranges from a minimum of +0.22 and a maximum of +87.26. This means that throughout the evaluation period, there was an insurance firm with the highest leverage, or the ratio of total liabilities to total assets, of +87.26, and an insurer with the lowest leverage, or the ratio of total liabilities to total assets, of +0.22. However, from its mean value of +24.11, the ratio of total long-term obligations to total assets has spread by a standard deviation of +19.71. Leverage is the amount of debt used by insurance companies to fund 0.30 of their total assets. Insurance companies used debt to fund this amount, and they preferred debt to equity financing.

The average premium growth has been +14.78, and the minimum premium growth rates were recorded as +58.99 and -23.65, respectively. The standard deviation for premium increases

is 14.12. The volume of capital has a mean and standard deviation of +68.22 and +17.15, respectively. The maximum and minimum capital amounts are, respectively, +98.44 and +32.35.

The underwriting risk has a mean and standard deviation of +24.19 and +13.60, respectively. The maximum and minimum of this variable are +61.04 and +1.38, respectively. “Liquidity has a mean and standard deviation of +58.47 and +26.75, respectively.” The liquidity ratio's overall maximum and minimum values are +98.68 and +5.44, respectively.

An average of real GDP growth rate during the previous eleven years has been +6.4. The maximum and minimum growth rates were +7.5 and +0.1, respectively.” The standard deviation for real GDP growth is +2.04. The highest rate of inflation was recorded in 2011, at +5.48, and the lowest rate was recorded in 2009, at -0.66. Over the research period, the rate of inflation was distributed, with a standard deviation of +1.51.

The results of the descriptive data analysis for the thirteen insurance companies and the twelve general insurance companies are similar. This is a slight difference between the number of them.

**Table 2-20: Descriptive Analysis**

	ROA	ROE	CS	LEV	PGR	VOC	UWR	LIQ	GDP	INF
Mean	4.41	6.51	16.65	22.80	14.78	68.22	24.19	58.47	6.40	2.74
Median	4.31	6.43	16.47	16.83	12.605	69.415	23.29	63.28	7.1	2.93
Maximum	11.97	16.18	18.95	87.26	58.99	98.44	61.04	98.68	7.5	5.48
Minimum	-3.56	-7.61	15.64	0.22	-23.65	32.35	1.38	5.44	0.1	-0.66
Std. Dev.	2.95	4.57	0.69	19.87	14.20	17.15	13.60	26.75	2.04	1.51
Skewness	-0.06	-0.50	1.33	1.69	0.59	-0.25	0.84	-0.27	-2.68	-0.52
Kurtosis	3.44	3.91	4.41	5.40	3.64	1.82	3.51	1.76	8.50	3.52
Jarque-Bera	1.16	10.02	49.89	94.39	9.97	9.10	17.15	10.05	323.93	7.37
Probability	0.56	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.03
Sum	582.09	859.73	2198.44	3009.88	1951.37	9004.87	3193.24	7718.42	844.80	362.28
Sum Sq. Dev.	1143.82	2763.99	62.97	51727.16	26397.79	38543.51	24236.86	93736.04	542.64	300.22

Note: Observations: 143, ROA: return on asset, ROE: return on equity, CS: company size, LEV: leverage, PGR: asset growth rate, VOC: volume of capital, IR: investment ratio, LIQ: liquidity, UWR: underwriting ratio, GDP: global domestic product, INF: inflation.

## 2. Model Selection and its specification

According to Brooks (2008), panel estimator approaches, such as fixed-effects and random-effects models, can be employed in research. “The random effect model always accounts for heterogeneity or distinctiveness among the selected firms by accounting for their unique intercept value.” It is time-invariant, but it shows differences in values from one firm to the next; the fixed-

effect model, on the other hand, has a time-variant mean value for the intercept. The researcher decides on the decision value, which is “if a statistically significant P-value from the Hausman test is at a 5% significance level, the fixed-effect model is selected instead of the random effect model.” The result of this analysis for twelve general insurance companies is as below:

**i. Return on Assets**

The Hausman test result, as shown in table 2-31 for ROA, indicates the P-value is less than 5%, which means the fixed-effect model is right for the ROA.

**Table 2-31: Hausman for ROA**

Correlated Random Effects – Hausman Test  
Equation: Untitled  
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	52.320712	8	0.0000

\*\* WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CS	1.109051	0.378788	0.260492	0.1525
LEV	0.078947	0.037553	0.000127	0.0002
PGR	0.041852	0.031169	0.000024	0.0285
VOC	0.061248	0.060617	0.000057	0.9336
UWR	-0.080754	-0.111311	0.000055	0.0000
LIQ	-0.017152	-0.020891	0.000058	0.6245
GDP	0.512446	0.632629	0.002849	0.0243
INF	-0.465885	-0.540152	0.004265	0.2554

Cross-section random effects test equation:

Dependent Variable: ROA  
Method: Panel Least Squares  
Date: 08/14/22 Time: 06:47  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.70295	9.879376	-1.994352	0.0485
CS	1.109051	0.570345	1.944527	0.0543
LEV	0.078947	0.014437	5.468527	0.0000
PGR	0.041852	0.012099	3.459148	0.0008
VOC	0.061248	0.013216	4.634545	0.0000
UWR	-0.080754	0.013425	-6.015418	0.0000
LIQ	-0.017152	0.009277	-1.848942	0.0671
GDP	0.512446	0.114834	4.462508	0.0000
INF	-0.465885	0.144654	-3.220673	0.0017

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.756051	Mean dependent var	4.409773
Adjusted R-squared	0.714666	S.D. dependent var	2.954901
S.E. of regression	1.578409	Akaike info criterion	3.889439
Sum squared resid	279.0339	Schwarz criterion	4.326227
Log likelihood	-236.7030	Hannan-Quinn criter.	4.066929
F-statistic	18.26904	Durbin-Watson stat	1.486339
Prob(F-statistic)	0.000000		

ii. Return on Equities

The Hausman test result, as show in table 2-32 for ROE, indicated the P-value is less than 5%, which means the fixed effect model is right for the ROE.

Table 2-32: Hausman for ROE

Correlated Random Effects - Hausman Test  
Equation: Untitled  
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	30.472234	8	0.0002

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CS	2.643009	1.002378	0.453398	0.0148
LEV	0.177155	0.109856	0.000209	0.0000
PGR	0.086014	0.088119	0.000026	0.6817
VOC	0.035767	0.039767	0.000080	0.6540
LIQ	-0.027406	-0.024308	0.000083	0.7336
UWR	-0.126189	-0.163032	0.000079	0.0000
GDP	0.543381	0.786539	0.005047	0.0006
INF	-0.510021	-0.734205	0.007354	0.0089

Cross-section random effects test equation:

Dependent Variable: ROE  
Method: Panel Least Squares  
Date: 08/20/22 Time: 07:40  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-42.67949	14.99520	-2.846211	0.0053
CS	2.643009	0.865686	3.053082	0.0028
LEV	0.177155	0.021912	8.084744	0.0000
PGR	0.086014	0.018364	4.683737	0.0000
VOC	0.035767	0.020059	1.783103	0.0773
LIQ	-0.027406	0.014081	-1.946374	0.0541

UWR	-0.126189	0.020376	-6.192968	0.0000
GDP	0.543381	0.174298	3.117543	0.0023
INF	-0.510021	0.219561	-2.322917	0.0220
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.765129	Mean dependent var	6.513106	
Adjusted R-squared	0.725285	S.D. dependent var	4.570893	
S.E. of regression	2.395753	Akaike info criterion	4.724000	
Sum squared resid	642.8390	Schwarz criterion	5.160788	
Log likelihood	-291.7840	Hannan-Quinn criter.	4.901490	
F-statistic	19.20306	Durbin-Watson stat	1.462556	
Prob(F-statistic)	0.000000			

## 2.1. Cross-section Fixed Effect Regression

The following cross-section fixed-effect model for ROA and ROE gives a complete analysis of each individual variable that defines financial performance, which are ROA and ROE. The details of the Panel Least Squares regression, cross-section fixed-effect model for ROA and ROE are in Table 3-31 and Table 2-32, respectively. The summary table 2-39 for the cross-section fixed effect for ROA and ROE is as below:

**Table 2-33: Fixed Effects for ROA**

Dependent Variable: ROA  
Method: Panel Least Squares  
Date: 08/13/22 Time: 12:21  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.70295	9.879376	-1.994352	0.0485
CS	1.109051	0.570345	1.944527	0.0543
LEV	0.078947	0.014437	5.468527	0.0000
PGR	0.041852	0.012099	3.459148	0.0008
VOC	0.061248	0.013216	4.634545	0.0000
UWR	-0.080754	0.013425	-6.015418	0.0000
LIQ	-0.017152	0.009277	-1.848942	0.0671
GDP	0.512446	0.114834	4.462508	0.0000
INF	-0.465885	0.144654	-3.220673	0.0017
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.756051	Mean dependent var	4.409773	
Adjusted R-squared	0.714666	S.D. dependent var	2.954901	
S.E. of regression	1.578409	Akaike info criterion	3.889439	
Sum squared resid	279.0339	Schwarz criterion	4.326227	
Log likelihood	-236.7030	Hannan-Quinn criter.	4.066929	
F-statistic	18.26904	Durbin-Watson stat	1.486339	
Prob(F-statistic)	0.000000			

**Table 2-35: Cross-section Fixed Effects for ROE**

Dependent Variable: ROE  
Method: Panel Least Squares  
Date: 08/20/22 Time: 08:02  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132

Variable	Coefficient	Std. Error	t-Statistic
C	-42.67949	14.99520	-2.846211
CS	2.643009	0.865686	3.053082
LEV	0.177155	0.021912	8.084744
PGR	0.086014	0.018364	4.683737
VOC	0.035767	0.020059	1.783103
LIQ	-0.027406	0.014081	-1.946374
UWR	-0.126189	0.020376	-6.192968
GDP	0.543381	0.174298	3.117543
INF	-0.510021	0.219561	-2.322917

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.765129	Mean dependent var	
Adjusted R-squared	0.725285	S.D. dependent var	
S.E. of regression	2.395753	Akaike info criterion	
Sum squared resid	642.8390	Schwarz criterion	
Log likelihood	-291.7840	Hannan-Quinn criter.	
F-statistic	19.20306	Durbin-Watson stat	
Prob(F-statistic)	0.000000		

**Table 2-39: Cross-section fixed effect regression model for ROA and ROE**

Variable	ROA	ROE
Constant	-19.70 ** (9.88)	-42.67 *** (14.99)
Company Size	1.11 ** (0.57)	2.64 *** (0.86)
Leverage	0.08 *** (0.01)	0.18 *** (0.02)
Premium Growth Rate	0.04 *** (0.01)	0.09 *** (0.02)
Volume of Capital	0.06 *** (0.01)	0.04 * (0.02)
Liquidity	-0.02 * (0.01)	-0.03 * (0.02)

	(0.01)	(0.01)
Underwriting Risk	-0.08 ***	-0.13 ***
	(0.01)	(0.02)
GDP	0.51 ***	0.54 **
	(0.11)	(0.17)
Inflation	-0.47 ***	-0.51 **
	(0.14)	(0.22)
R <sup>2</sup>	0.75	0.76
Adjust R <sup>2</sup>	0.71	0.73
No. observations	132	132

Standard errors are reported in parentheses.

\*, \*\*, \*\*\* indicates “significance at the 0.10, 0.05, and 0.01 level, respectively.”

### 3. CLRM Assumptions and Diagnostic

The CLRM’s assumptions are focused on model misspecification and how to correct it to increase research quality. The data validity of the research’s regressed conclusion is preserved thanks to CLRM assumptions. As a result, the diagnostic test is used to see if the traditional linear regression model assumption has been violated (Brooks, 2008). There are diagnostic tests that look for heteroscedasticity, autocorrelation, multicollinearity, and normality, which are all things that must be met for CLRM to work. The result of these tests is what we’re going to talk about next.

#### 3.1. Multicollinearity

This research uses the correlation matrix and the “Variance-Inflation Factor (VIF) as the multicollinearity test for twelve general insurance companies.”

##### 3.1.1. Correlation Analysis

As shown in Table 2-21 for the study of the 12 general insurance companies, there is a strong positive relationship between the dependent variables of ROA and ROE with each other, +0.89. Similarly, GDP and inflation are also positively correlated with each other at +0.67.

In rapidly growing economies like Cambodia, internal and external factors such as company size, leverage, premium growth rate, GDP, and inflation have shown a positive correlation with ROA and ROE. Underwriting risk and liquidity have a negative correlation with

ROA and ROE. At the same time, the volume of capital has a positive correlation with ROA and a negative correlation with ROE. Furthermore, the LIQ and INF has no correlation.

**Table 2-21 Correlation Matrix**

	ROA	ROE	CS	LEV	PGR	VOC	UWR	LIQ	GDP	INF
ROA	1									
ROE	0.89	1								
CS	0.01	0.17	1							
LEV	0.08	0.32	0.45	1						
PGR	0.13	0.23	-0.20	0.08	1					
VOC	0.26	-0.03	-0.48	-0.58	-0.07	1				
UWR	-0.60	-0.50	0.15	0.21	0.12	-0.30	1			
LIQ	-0.18	-0.19	-0.07	-0.17	-0.05	0.17	-0.03	1		
GDP	0.40	0.43	0.13	0.15	0.32	-0.09	-0.15	-0.02	1	
INF	0.02	0.06	-0.05	0.03	0.30	-0.10	0.01	0.00	0.67	1

### 3.1.2. Variance-Inflation Factor (VIF)

Multicollinearity is a problem that emerges when the explanatory variables are extremely highly associated with one another. If near multicollinearity issues are present but neglected, R square will be high, but individual coefficients will have large standard errors, making the regression look excellent but the individual variables will be unimportant (Brooks, 2014). In terms of the variance inflation components, the severity of the problem of multicollinearity across the independent variables is investigated (VIF). Gujarati (2003) defines extremely collinear variables as those with a VIF greater than 10. In this study of 12 general insurance companies, the VIF results for each explanatory variable included in the regression model are very low (less than 3), showing that the estimated model does not have a serious multicollinearity problem. Since this is the case, multicollinearity between the explanatory variables is not a problem in Table 2-22 as below:

**Table 2-22: Multicollinearity (Variance Inflation Factors) for ROA and ROE**

Variance Inflation Factors  
 Date: 08/20/22 Time: 08:09  
 Sample: 1 132  
 Included observations: 132

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	67.12713	1060.091	NA
CS	0.217408	953.9975	1.637971
LEV	0.000271	3.909220	1.680084
PGR	0.000411	2.718318	1.298895

VOC	0.000393	30.71287	1.813269
UWR	0.000420	5.095260	1.216858
LIQ	9.29E-05	6.058357	1.041889
GDP	0.034685	24.68754	2.251746
INF	0.055895	8.656707	2.007637

### 3.1.3. Normality

The residual is considered to have a normal distribution with a constant variance and a zero mean (Brooks, 2008). If the residuals were evenly scattered, then the histogram would look like a bell. The statistics Jarque-Bera provided were not important. Brooks (2008) says that the p-values at the bottom of the normality test screen must be greater than 0.05 to reject the null hypothesis of normality at the 0.05 level.

The following is the normalcy test hypothesis:

H0: The residuals are distributed properly

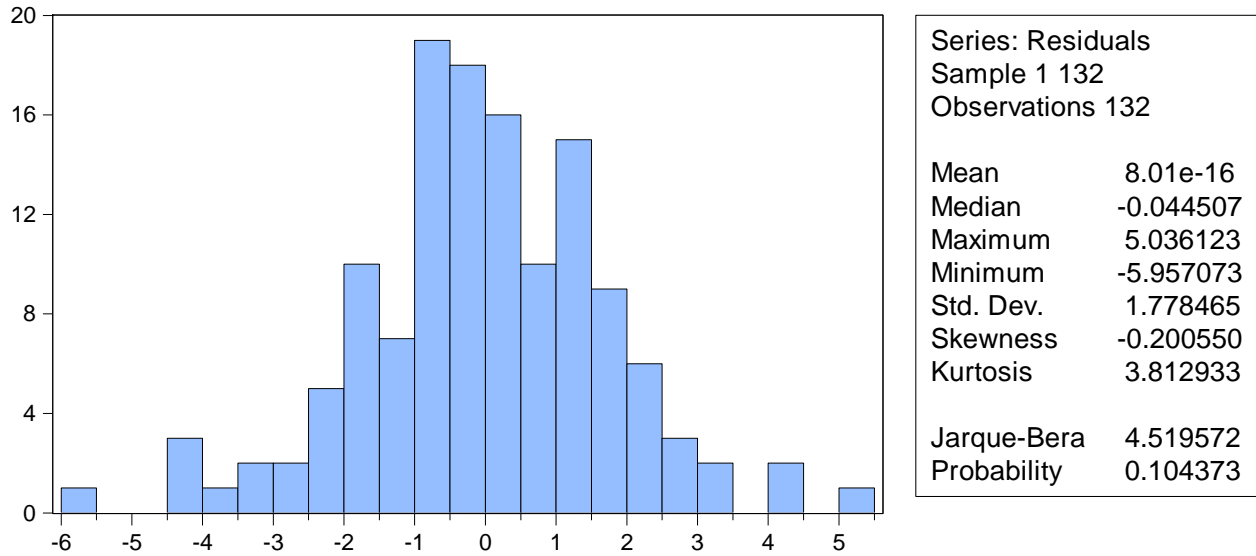
H1: The residuals do not follow a normal distribution

#### i. Return on Assets

The Jarque-Bera normality test for twelve general insurance companies yielded a chi-square value of 0.10, which is significantly higher than the p-value of 0.05, as shown in Table 2-23. The normality of the null hypothesis was tested in this study, but it did not hold up at the 0.05 level. This means that the residuals are evenly spaced, and that the data fits the normal distribution assumption, which is what this shows.

In addition to the official evaluations for normalcy, we visually analyzed the data using histograms. When a histogram's form resembles that of a bell curve, it indicates that the data may have originated from a normal population. The researcher looks at graph 2-3, which shows that the graph has a bell curve. This shows that the residuals seem to be evenly distributed.

**Table 2-23: Standardized Residuals for ROA, Graph 2-3: Histogram for ROA**

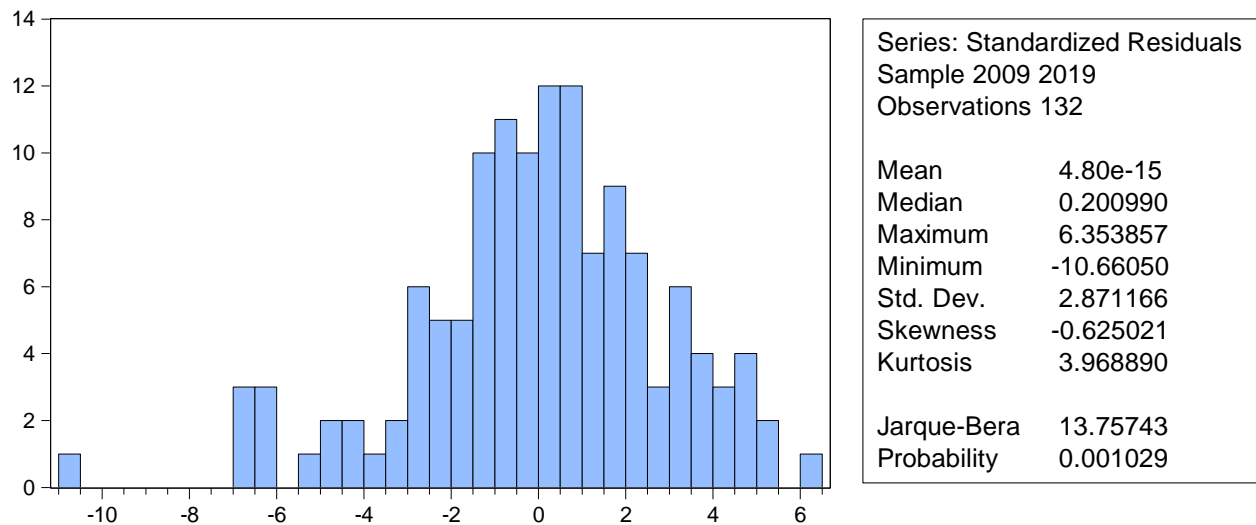


**ii. Return on Equities**

As shown in Table 2-24, the Jarque-Bera normality test for twelve insurance companies yielded a chi-square value of 0.001, which is significantly lower than the p-value of 0.05. As a result, at the 0.05 significance level, the null hypothesis of normality cannot be rejected. This means that the residual doesn't have a normal distribution, and the data backs this up as well.

In addition to the formal tests for normalcy, we visually examined the data using histograms. When a histogram's form resembles that of a bell curve, it indicates that the data may have originated from a normal population. The researcher looks at graph 2-4, which shows that the graph does not have a bell curve. This shows that the residuals seem to be evenly distributed.

**Table 2-24: Standardized Residuals for ROE, Graph 2-4: Histogram for ROE**



### 3.1.4. Heteroscedasticity

The homoscedasticity assumption states that the error variance is constant. The mistakes are heteroscedastic if their variance is not constant. If there is heteroscedasticity, the standard errors may be incorrect, and any conclusions drawn may mislead (Brooks, 2014). The Breusch-Pagan/Cook-Weisberg test is a chi-squared test. The “Breusch-Pagan/Cook-Weisberg test” was used to look for heteroscedasticity under the null hypothesis that error variance is homoscedastic. If the test statistic has a p-value lower than the appropriate threshold ( $p > 0.05$ ), then heteroscedasticity is assumed, and the null hypothesis of homoscedasticity is rejected. Therefore, the results of “ROA and ROE” for twelve general insurance companies as, shown in Table 2-25 and Table 2-26, were statistically significant, showing the existence of heteroscedasticity, respectively, and the details of these two tables are as below:

**Table 2-25: Heteroskedasticity test: Breusch-Pagan-Godfrey for ROA**

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	2.943948	Prob. F(8,123)	0.0048	
Obs*R-squared	21.21307	Prob. Chi-Square(8)	0.0066	
Scaled explained SS	25.90569	Prob. Chi-Square(8)	0.0011	
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 08/08/22 Time: 18:09				
Sample: 1 132				
Included observations: 132				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.893663	14.15937	0.628112	0.5311
CS	-0.596948	0.805809	-0.740805	0.4602
LEV	0.005796	0.028475	0.203548	0.8390
PGR	0.047784	0.035048	1.363380	0.1753
VOC	0.099249	0.034270	2.896081	0.0045
UWR	-0.015732	0.035403	-0.444366	0.6576
LIQ	-0.028786	0.016658	-1.728070	0.0865
GDP	-0.310923	0.321857	-0.966028	0.3359
INF	0.230227	0.408585	0.563474	0.5741
R-squared	0.160705	Mean dependent var	3.138974	
Adjusted R-squared	0.106117	S.D. dependent var	5.284681	
S.E. of regression	4.996422	Akaike info criterion	6.121067	
Sum squared resid	3070.601	Schwarz criterion	6.317622	
Log likelihood	-394.9904	Hannan-Quinn criter.	6.200938	
F-statistic	2.943948	Durbin-Watson stat	1.701737	
Prob(F-statistic)	0.004800			

**Table 2-26: Heteroskedasticity: Breusch-Pagan-Godfrey for ROE**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.473188	Prob. F(8,123)	0.0160
Obs*R-squared	18.29098	Prob. Chi-Square(8)	0.0191
Scaled explained SS	19.82097	Prob. Chi-Square(8)	0.0110

Test Equation:  
 Dependent Variable: RESID^2  
 Method: Least Squares  
 Date: 08/20/22 Time: 08:15  
 Sample: 1 132  
 Included observations: 132

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	61.09667	33.52874	1.822218	0.0709
CS	-2.798258	1.908121	-1.466500	0.1451
LEV	0.095632	0.067428	1.418294	0.1586
PGR	0.026999	0.082992	0.325321	0.7455
VOC	0.014162	0.081150	0.174510	0.8618
UWR	0.108152	0.083833	1.290086	0.1994
LIQ	-0.097938	0.039445	-2.482913	0.0144
GDP	-1.433131	0.762143	-1.880397	0.0624
INF	0.740768	0.967510	0.765644	0.4454

R-squared	0.138568	Mean dependent var	7.788610
Adjusted R-squared	0.082540	S.D. dependent var	12.35205
S.E. of regression	11.83130	Akaike info criterion	7.845121
Sum squared resid	17217.51	Schwarz criterion	8.041676
Log likelihood	-508.7780	Hannan-Quinn criter.	7.924992
F-statistic	2.473188	Durbin-Watson stat	1.866279
Prob(F-statistic)	0.016050		

### 3.1.5. Autocorrelation

The researcher used the “correlogram-Q-statistic test and its p-value” for partial autocorrelation (PAC) and autocorrelation (AC) analysis. No serial correlation means that PAC and AC would be close to 0 at all the lags, as well as the Q-statistic being insignificant with huge p-values if there isn’t a lot of serial correlation, too. The autocorrelation results for the twelve general insurance companies for ROA and ROE are shown in table 2-27 and table 2-28. Based on the “Q-statistic and its p-value of these two tables,” there is no PAC and AC issue between the model’s variables. In addition, a first order “serial correlation test is the Durbin-Watson (DW) statistic.” The “DW statistic” evaluates the linear relationship between neighboring residuals in a regression model. The DW test was used to see whether the hypothesis ( $=0$ ) in the specification is correct. This is a common misunderstanding.

$$u_{it} = \rho u_{it-1} - \varepsilon_{it}$$

The “DW statistic” will be about 2 if there is no serial relationship. If there is a positive serial correlation, the “DW statistic” will go below 2. (In the worst-case scenario, it will be close to zero).

The statistic will be between 2 and 4 if there is a negative association. As a matter of thumb, test statistic scores in the 1.5 to 2.5 range are normal. Table 2-37 and Table 2-38 summarize the findings for ROA and ROE of the twelve general insurance companies, respectively. The DW statistic in these two models equals 1.20 and 1.08 for ROA and ROE, respectively. This indicator that DW is rather typical and that there was no serial correlation. This means that there is no evidence for autocorrelation because it can be seen in the non-rejection area.

**Table 2-27: Correlogram of residual for ROA**

Date: 08/16/22 Time: 22:38  
 Sample: 1 132  
 Included observations: 132

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
. ***	.***	1	0.373	0.373	18.775	0.000
. **	.*	2	0.246	0.125	27.035	0.000
. *	.	3	0.136	0.010	29.555	0.000
. .	* .	4	-0.033	-0.131	29.705	0.000
. .	.	5	-0.044	-0.019	29.977	0.000
. .	.	6	0.007	0.067	29.983	0.000
. *	.*	7	0.108	0.142	31.643	0.000
. *	.	8	0.142	0.069	34.524	0.000
. *	.	9	0.134	0.011	37.104	0.000
. *	.	10	0.095	-0.017	38.407	0.000
. *	.*	11	0.173	0.154	42.766	0.000
. .	* .	12	-0.004	-0.107	42.769	0.000
. .	.	13	-0.007	-0.014	42.776	0.000
. .	.	14	-0.047	-0.063	43.104	0.000
. .	.	15	-0.021	0.047	43.172	0.000
. *	* .	16	-0.125	-0.156	45.561	0.000
. *	* .	17	-0.149	-0.112	48.980	0.000
. *	* .	18	-0.204	-0.184	55.425	0.000
. **	* .	19	-0.235	-0.108	64.039	0.000
. *	.	20	-0.160	-0.015	68.101	0.000
. *	.	21	-0.154	-0.054	71.904	0.000
. .	.*	22	0.071	0.158	72.717	0.000
. .	* .	23	-0.032	-0.078	72.886	0.000
. .	.	24	-0.026	-0.006	72.997	0.000
. *	.	25	-0.067	-0.017	73.737	0.000
. *	.	26	-0.158	-0.047	77.891	0.000
. **	* .	27	-0.266	-0.113	89.839	0.000
. **	* .	28	-0.256	-0.068	100.98	0.000
. *	.	29	-0.192	-0.000	107.29	0.000
. .	.*	30	-0.055	0.103	107.82	0.000
. .	.	31	0.035	0.049	108.03	0.000
. .	.	32	0.048	-0.005	108.44	0.000
. *	.	33	0.161	0.069	113.05	0.000
. .	.	34	0.004	-0.041	113.05	0.000
. *	.*	35	0.106	0.165	115.10	0.000
. .	* .	36	-0.013	-0.075	115.13	0.000

**Table 2-28: Correlogram of residual for ROE**

Date: 08/20/22 Time: 08:12  
 Sample: 1 132

Included observations: 132

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
. ***	***	1	0.406	0.406	22.211	0.000
. **	*	2	0.227	0.075	29.219	0.000
. *	.	3	0.086	-0.035	30.238	0.000
. .	*	4	-0.064	-0.123	30.797	0.000
* .	.	5	-0.094	-0.038	32.017	0.000
* .	.	6	-0.105	-0.031	33.552	0.000
. .	*	7	0.013	0.109	33.577	0.000
. *	.	8	0.080	0.069	34.485	0.000
. .	.	9	0.061	-0.023	35.026	0.000
. .	*	10	-0.037	-0.129	35.225	0.000
. .	.	11	-0.041	-0.007	35.472	0.000
* .	*	12	-0.154	-0.119	38.970	0.000
. .	*	13	-0.048	0.118	39.308	0.000
. .	.	14	-0.055	-0.028	39.758	0.000
. .	*	15	0.052	0.089	40.163	0.000
. .	*	16	0.003	-0.125	40.164	0.001
. .	.	17	0.001	-0.001	40.165	0.001
* .	*	18	-0.078	-0.121	41.105	0.001
* .	.	19	-0.139	-0.024	44.132	0.001
. .	.	20	-0.065	0.056	44.796	0.001
. .	.	21	-0.038	0.048	45.030	0.002
. *	*	22	0.158	0.164	49.039	0.001
. .	*	23	0.026	-0.172	49.147	0.001
. .	.	24	0.032	-0.056	49.318	0.002
. .	.	25	-0.021	-0.042	49.388	0.003
* .	.	26	-0.083	-0.008	50.544	0.003
** .	*	27	-0.237	-0.156	60.005	0.000
** .	.	28	-0.217	-0.049	68.011	0.000
* .	*	29	-0.178	-0.085	73.474	0.000
* .	.	30	-0.089	-0.023	74.862	0.000
. .	.	31	-0.034	-0.034	75.069	0.000
. .	.	32	-0.047	-0.028	75.457	0.000
. .	.	33	0.053	0.052	75.961	0.000
. .	.	34	-0.043	-0.032	76.294	0.000
. .	*	35	0.058	0.085	76.902	0.000
. .	.	36	0.054	0.048	77.444	0.000

**Table 2-29: Serial Correlation LM for ROA**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	15.10200	Prob. F(2,121)	0.0000
Obs*R-squared	26.36788	Prob. Chi-Square(2)	0.0000

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 08/16/22 Time: 22:41

Sample: 1 132

Included observations: 132

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.253573	4.700192	0.053950	0.9571
CS	-0.104430	0.268887	-0.388378	0.6984
LEV	0.006725	0.009546	0.704422	0.4825

PGR	0.011544	0.011876	0.972091	0.3329
VOC	0.010926	0.011542	0.946630	0.3457
UWR	0.020649	0.012329	1.674804	0.0966
LIQ	0.003329	0.005555	0.599268	0.5501
GDP	-0.109761	0.109819	-0.999475	0.3196
INF	0.152449	0.139266	1.094662	0.2758
RESID(-1)	0.418502	0.095453	4.384387	0.0000
RESID(-2)	0.177362	0.092891	1.909358	0.0586
<hr/>				
R-squared	0.199757	Mean dependent var	8.01E-16	
Adjusted R-squared	0.133621	S.D. dependent var	1.778465	
S.E. of regression	1.655386	Akaike info criterion	3.925600	
Sum squared resid	331.5765	Schwarz criterion	4.165834	
Log likelihood	-248.0896	Hannan-Quinn criter.	4.023220	
F-statistic	3.020401	Durbin-Watson stat	1.828424	
Prob(F-statistic)	0.001921			

**Table 2-30: Serial Correlation LM for ROE**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	14.71395	Prob. F(2,121)	0.0000
Obs*R-squared	25.82289	Prob. Chi-Square(2)	0.0000

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 08/20/22 Time: 08:16

Sample: 1 132

Included observations: 132

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.147860	7.412093	-0.019948	0.9841
CS	-0.090748	0.423110	-0.214477	0.8305
LEV	0.007599	0.015101	0.503203	0.6157
PGR	0.011339	0.018561	0.610875	0.5424
VOC	0.010510	0.018120	0.580046	0.5630
UWR	0.022734	0.019033	1.194497	0.2346
LIQ	0.003357	0.008744	0.383996	0.7017
GDP	-0.112614	0.171193	-0.657817	0.5119
INF	0.206911	0.218276	0.947932	0.3451
RESID(-1)	0.422744	0.093600	4.516512	0.0000
RESID(-2)	0.106504	0.094713	1.124490	0.2630
<hr/>				
R-squared	0.195628	Mean dependent var	3.34E-15	
Adjusted R-squared	0.129151	S.D. dependent var	2.801440	
S.E. of regression	2.614284	Akaike info criterion	4.839513	
Sum squared resid	826.9721	Schwarz criterion	5.079746	
Log likelihood	-308.4078	Hannan-Quinn criter.	4.937133	
F-statistic	2.942791	Durbin-Watson stat	1.883052	
Prob(F-statistic)	0.002431			

## 2.4. Summary of the chapter

This chapter presents the empirical analysis, which includes the research method, research results, and robustness check. This research used eleven years of time series panel data. The data for the microeconomic factors (internal factors) came from the Cambodian Insurance Association and the Ministry of Economy and Finance. The macroeconomic factors were found on the World Bank website. The researcher used Eviews 9 for the data analysis, which included ordinary least squares to find the most important and influential explanatory variable for the data analysis. This chapter also discussed how to measure DV and IV, an empirical model specification, and how to think about ethical considerations.

The research findings are the descriptive statistics that were calculated during the research. These statistics include the “mean, maximum, minimum, and standard deviation” for each research variable. The researcher used cross-section fixed effect regression after doing the Hausman test. To make sure the results aren’t a fluke, the researcher uses regression diagnostic for testing multicollinearity, which include correlation analysis, variance-inflation factor, and CLRM assumptions and diagnostics. The assumptions of the CLRM are concerned with model misspecification and how to repair it to improve research quality. This test includes zero mean value of errors, normality, heteroscedasticity, and autocorrelation.

This researcher does the explanatory diagnosis for twelve insurance companies to compare with the thirteen insurance companies. As a result of the cross-section fixed effect of Table 2-33 and Table 2-35 in Table 2-40, all the independent variables for the ROA model have the same impact, but the coefficients of these factors are similar. At the same time, all the independent variables for the ROE model have the same impact and the coefficients of these factors are similar except the volume of capital variable has a positive insignificant impact for twelve general insurance companies’ data and a positive significant impact for thirteen insurance companies’ data. Furthermore, the R-square coefficient of the ROA model for twelve general insurance companies is 0.75, which is higher than the R-square coefficient for thirteen insurance companies at 0.74, and the R-square coefficient of the ROE model for twelve general insurance companies is 0.76, which is higher than the R-square coefficient for thirteen insurance companies at 0.75.

Based on the analysis result, the nature of general and life insurance, the financial performance of insurance companies for the ROA and ROE for twelve general insurance companies is the same as the thirteen insurance companies.

**Table 2-40: Summary and the comparing twelve general insurance companies and thirteen insurance companies for ROA and ROE model**

Variable	ROA		ROE	
	12 Cos	13 Cos	12 Cos	13 Cos
Constant	-19.70 ** (9.88)	-20.99 ** (9.48)	-42.67 *** (14.99)	-56.35 *** (14.63)
Company Size	1.11 ** (0.57)	1.16 *** (0.55)	2.64 *** (0.86)	3.42 *** (0.85)
Leverage	0.08 *** (0.01)	0.08 *** (0.01)	0.18 *** (0.02)	0.18 *** (0.02)
Premium Growth Rate	0.04 *** (0.01)	0.04 *** (0.01)	0.09 *** (0.02)	0.08 *** (0.02)
Volume of Capital	0.06 *** (0.01)	0.06 *** (0.01)	0.04 * (0.02)	0.04 ** (0.02)
Liquidity	-0.02 * (0.01)	-0.02 * (0.01)	-0.03 * (0.01)	-0.03 * (0.01)
Underwriting Risk	-0.08 *** (0.01)	-0.08 *** (0.01)	-0.13 *** (0.02)	-0.13 *** (0.02)
GDP	0.51 *** (0.11)	0.49 *** (0.11)	0.52 ** (0.17)	0.50 ** (0.18)
Inflation	-0.47 *** (0.14)	-0.38 ** (0.14)	-0.51 ** (0.22)	-0.33 ** (0.22)
R <sup>2</sup>	0.75	0.74	0.76	0.75
Adjust R <sup>2</sup>	0.71	0.70	0.73	0.71
No. observations	132	143	132	143

Standard errors are reported in parentheses.

\*, \*\*, \*\*\* indicates “significance at the 0.10, 0.05, and 0.01 level, respectively.”

**Table 2-37: Panel Least Squares Regression for ROA**

Dependent Variable: ROA  
Method: Panel Least Squares  
Date: 08/13/22 Time: 12:16  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.003152	5.201312	-1.154161	0.2507

CS	0.378788	0.296007	1.279659	0.2031
LEV	0.037553	0.010460	3.590119	0.0005
PGR	0.031169	0.012875	2.421002	0.0169
VOC	0.060617	0.012589	4.815127	0.0000
UWR	-0.111311	0.013005	-8.559064	0.0000
LIQ	-0.020891	0.006119	-3.414157	0.0009
GDP	0.632629	0.118231	5.350776	0.0000
INF	-0.540152	0.150090	-3.598857	0.0005
<hr/>				
R-squared	0.637753	Mean dependent var	4.409773	
Adjusted R-squared	0.614193	S.D. dependent var	2.954901	
S.E. of regression	1.835390	Akaike info criterion	4.118137	
Sum squared resid	414.3446	Schwarz criterion	4.314692	
Log likelihood	-262.7970	Hannan-Quinn criter.	4.198008	
F-statistic	27.06845	Durbin-Watson stat	1.205566	
Prob(F-statistic)	0.000000			

**Table 2-38: Panel Least Squares Regression for ROE**

Dependent Variable: ROE  
Method: Panel Least Squares  
Date: 08/20/22 Time: 09:27  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.28645	8.193115	-1.377553	0.1708
CS	0.861775	0.466270	1.848231	0.0670
LEV	0.084671	0.016477	5.138812	0.0000
PGR	0.078807	0.020280	3.885933	0.0002
VOC	0.038634	0.019830	1.948291	0.0537
UWR	-0.176645	0.020485	-8.622918	0.0000
LIQ	-0.023051	0.009639	-2.391438	0.0183
GDP	0.843713	0.186238	4.530294	0.0000
INF	-0.751712	0.236422	-3.179538	0.0019
<hr/>				
R-squared	0.624370	Mean dependent var	6.513106	
Adjusted R-squared	0.599939	S.D. dependent var	4.570893	
S.E. of regression	2.891109	Akaike info criterion	5.026903	
Sum squared resid	1028.097	Schwarz criterion	5.223458	
Log likelihood	-322.7756	Hannan-Quinn criter.	5.106774	
F-statistic	25.55621	Durbin-Watson stat	1.070850	
Prob(F-statistic)	0.000000			

**Table 2-34: Cross-section random effects for ROA**

Dependent Variable: ROA  
Method: Panel EGLS (Cross-section random effects)  
Date: 08/16/22 Time: 22:54  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132  
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
----------	-------------	------------	-------------	-------

C	-6.003152	4.473054	-1.342070	0.1820
CS	0.378788	0.254561	1.488001	0.1393
LEV	0.037553	0.008996	4.174627	0.0001
PGR	0.031169	0.011072	2.815165	0.0057
VOC	0.060617	0.010826	5.599079	0.0000
UWR	-0.111311	0.011184	-9.952567	0.0000
LIQ	-0.020891	0.005262	-3.970016	0.0001
GDP	0.632629	0.101677	6.221937	0.0000
INF	-0.540152	0.129075	-4.184787	0.0001
Effects Specification				
			S.D.	Rho
Cross-section random			0.000000	0.0000
Idiosyncratic random			1.578409	1.0000
Weighted Statistics				
R-squared	0.637753	Mean dependent var		4.409773
Adjusted R-squared	0.614193	S.D. dependent var		2.954901
S.E. of regression	1.835390	Sum squared resid		414.3446
F-statistic	27.06845	Durbin-Watson stat		1.205566
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.637753	Mean dependent var		4.409773
Sum squared resid	414.3446	Durbin-Watson stat		1.205566

**Table 2-36: Cross-section random effects for ROE**

Dependent Variable: ROE  
Method: Panel EGLS (Cross-section random effects)  
Date: 08/20/22 Time: 07:59  
Sample: 2009 2019  
Periods included: 11  
Cross-sections included: 12  
Total panel (balanced) observations: 132  
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic
C	-14.35531	9.490191	-1.512647
CS	1.002378	0.544072	1.842365
LEV	0.109856	0.016460	6.674227
PGR	0.088119	0.017632	4.997540
VOC	0.039767	0.017965	2.213560
LIQ	-0.024308	0.010742	-2.262793
UWR	-0.163032	0.018333	-8.892801
GDP	0.786539	0.159163	4.941721
INF	-0.734205	0.202122	-3.632480
Effects Specification			
			S.D.
Cross-section random			1.019406
Idiosyncratic random			2.395753
Weighted Statistics			
R-squared	0.658936	Mean dependent var	

Adjusted R-squared	0.636753	S.D. dependent var	4.352547
S.E. of regression	2.623280	Sum squared resid	846.4367
F-statistic	29.70447	Durbin-Watson stat	1.203528
Prob(F-statistic)	0.000000		

---

Unweighted Statistics

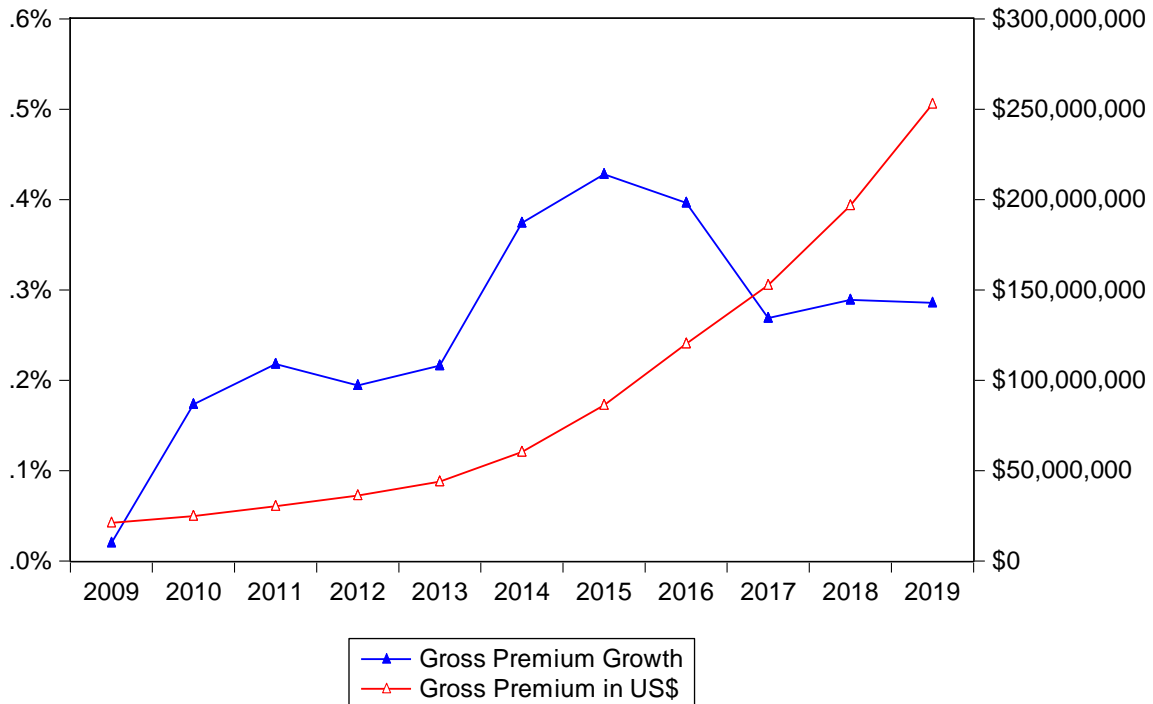
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R-squared	0.605439	Mean dependent var	6.513106
Sum squared resid	1079.911	Durbin-Watson stat	0.943328

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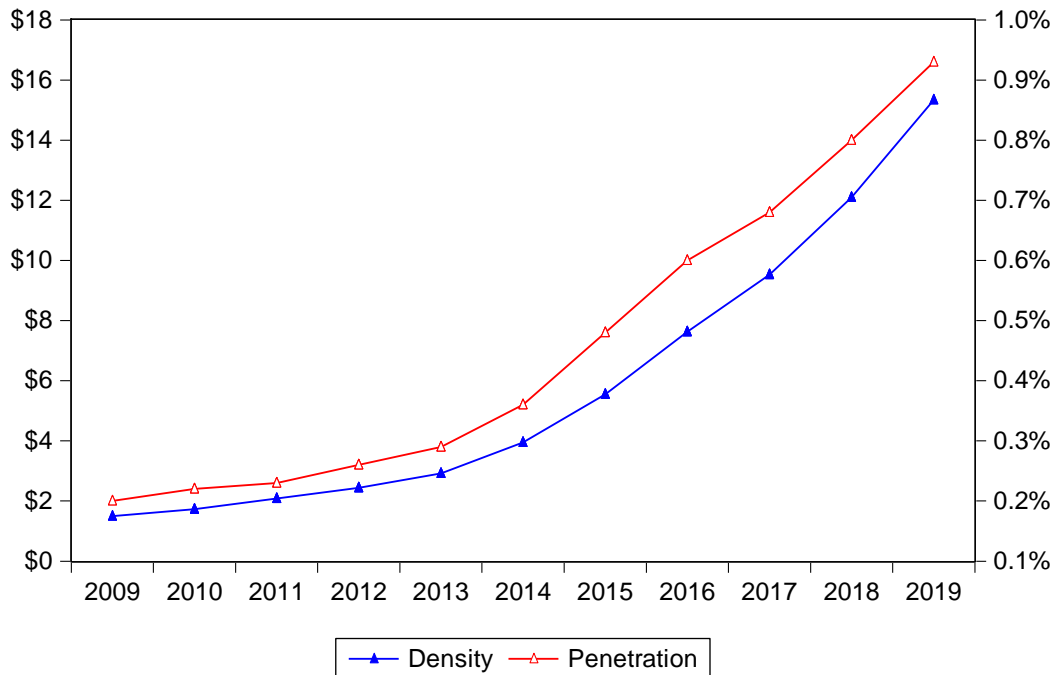
## APPENDIX F

**Figure 1-1: Graph 1-1 the Insurance Industry Premium in Cambodia**



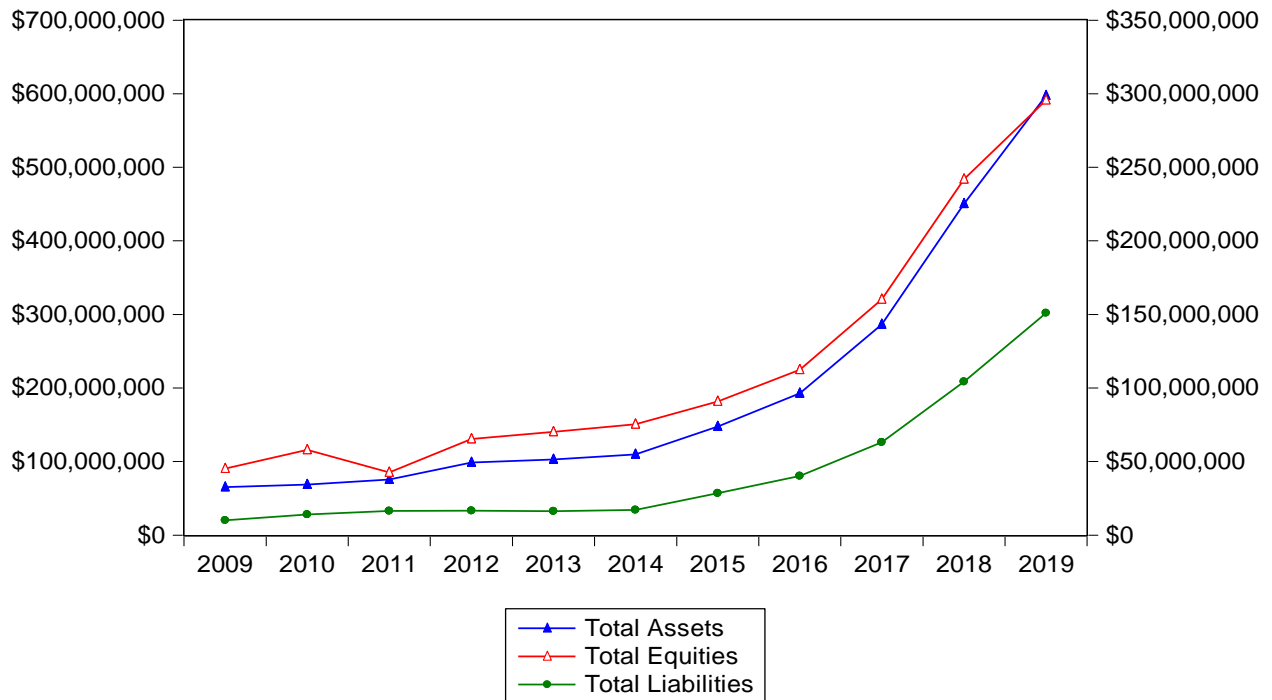
Source: The Cambodian Ministry of Economy and Finance, Insurance Association of Cambodia 2020.

**Figure 1-2: Graph 1-2 the Insurance Density and Penetration Industry in Cambodia**



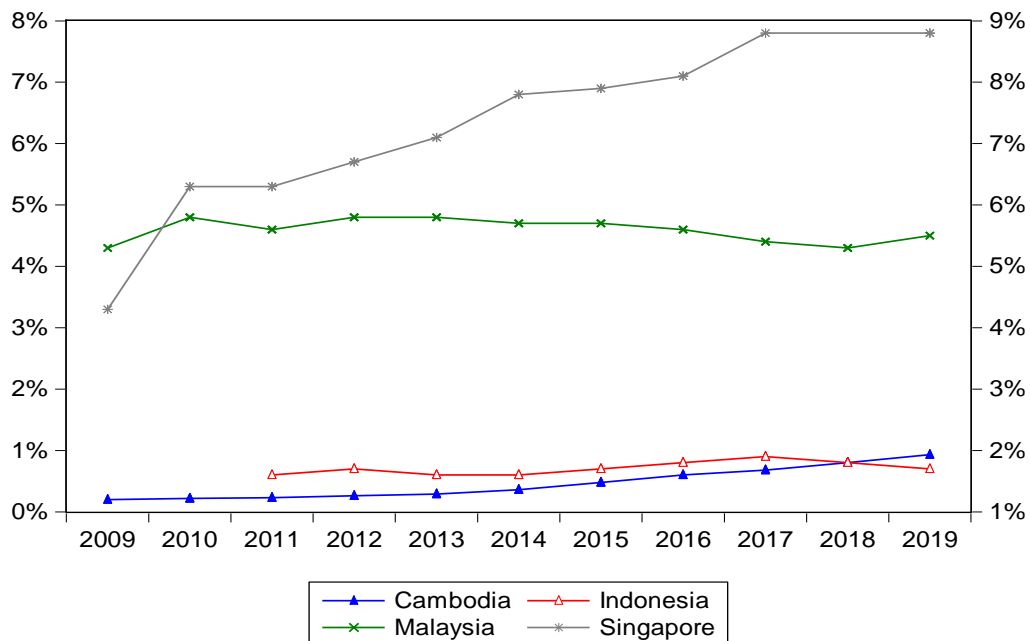
Source: The Cambodian Ministry of Economy and Finance, Insurance Association of Cambodia 2020.

**Figure 1-3: Graph 1-3 the Total Assets, Total Equities, and Total Liabilities for The Insurance Industry in Cambodia**



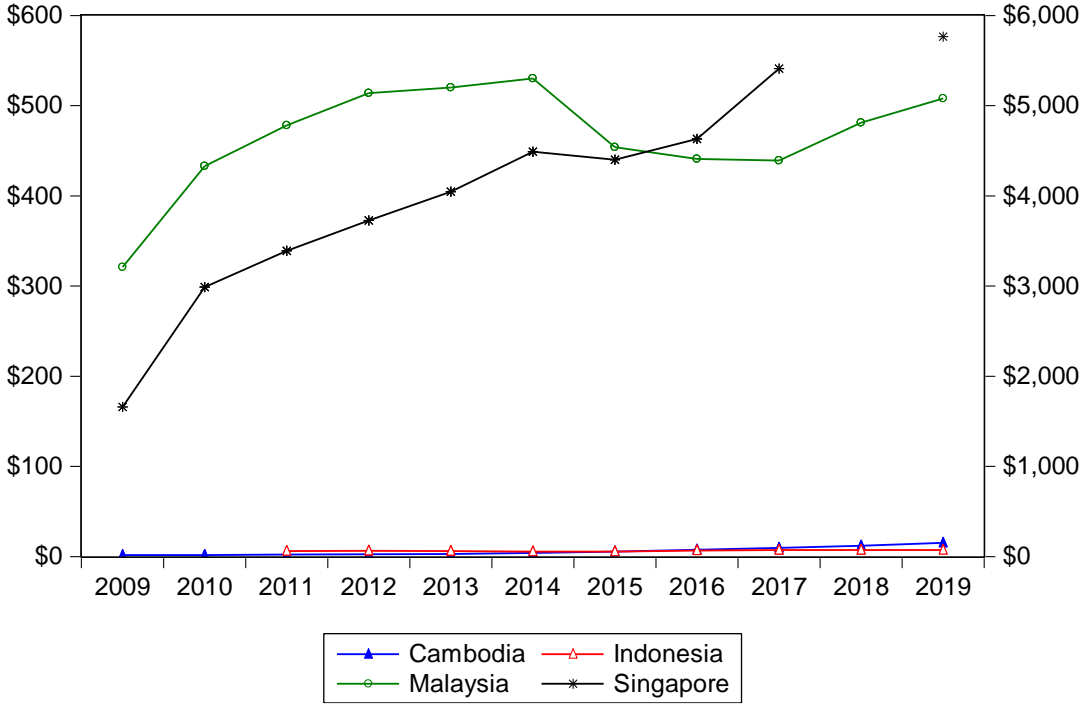
Source: The Cambodian Ministry of Economy and Finance, Insurance Association Cambodia.

**Figure 1-4: Graph 1-4 Insurance Penetration Industry in Cambodia, Indonesia, Malaysia and Singapore**



Source: OECD 2020 and the Cambodian Ministry of Economy and Finance, Insurance Association of Cambodia 2020.

**Figure 1-5: Graph 1-5 Insurance Density Industry in Cambodia, Indonesia, Malaysia and Singapore**



Source: OECD 2020 and the Cambodian Ministry of Economy and Finance, Insurance Association of Cambodia 2020.

## APPENDIX G

**Table 2-41: First difference estimator for ROA**

Dependent Variable: ROA  
 Method: Panel Least Squares  
 Date: 08/25/22 Time: 22:24  
 Sample: 2009 2019  
 Periods included: 11  
 Cross-sections included: 13  
 Total panel (balanced) observations: 143  
 White period standard errors & covariance (no d.f. correction)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.468008	5.110586	-0.874265	0.3835
CS	0.261760	0.270357	0.968202	0.3347
LEV	0.041549	0.008095	5.132473	0.0000
PGR	0.029360	0.012448	2.358599	0.0198
VOC	0.061615	0.014626	4.212751	0.0000
UWR	-0.104912	0.010403	-10.08505	0.0000
LIQ	-0.020442	0.008835	-2.313810	0.0222
GDP	0.621103	0.119880	5.181018	0.0000
INF	-0.460112	0.149121	-3.085500	0.0025
R-squared	0.621867	Mean dependent var	4.368462	
Adjusted R-squared	0.599291	S.D. dependent var	2.921968	
S.E. of regression	1.849651	Akaike info criterion	4.128740	
Sum squared resid	458.4419	Schwarz criterion	4.315213	
Log likelihood	-286.2049	Hannan-Quinn criter.	4.204514	
F-statistic	27.54653	Durbin-Watson stat	1.240005	
Prob(F-statistic)	0.000000			

**Table 2-42: First difference estimator test for ROE**

Dependent Variable: ROE  
 Method: Panel Least Squares  
 Date: 08/25/22 Time: 22:31  
 Sample: 2009 2019  
 Periods included: 11  
 Cross-sections included: 13  
 Total panel (balanced) observations: 143  
 White period standard errors & covariance (no d.f. correction)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.58832	8.126071	-1.426067	0.1562
CS	0.865462	0.381155	2.270632	0.0248
LEV	0.091570	0.017960	5.098444	0.0000
PGR	0.077497	0.024329	3.185333	0.0018
VOC	0.036072	0.021557	1.673315	0.0966
UWR	-0.169924	0.023894	-7.111444	0.0000
LIQ	-0.025581	0.013801	-1.853597	0.0660
GDP	0.856413	0.196202	4.364943	0.0000
INF	-0.639068	0.252336	-2.532605	0.0125
R-squared	0.621229	Mean dependent var	6.543776	
Adjusted R-squared	0.598616	S.D. dependent var	4.594748	
S.E. of regression	2.910999	Akaike info criterion	5.035739	

Sum squared resid	1135.504	Schwarz criterion	5.222211
Log likelihood	-351.0553	Hannan-Quinn criter.	5.111512
F-statistic	27.47194	Durbin-Watson stat	1.140031
Prob(F-statistic)	0.000000		

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