

Factors affecting the profitability of listed agricultural companies in the Vietnamese stock market



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Abstract This paper aims to investigate the factors affecting the profitability of agricultural companies in Vietnam. The study is conducted using data from 30 listed agricultural companies on the Vietnamese stock market during 2020-2022. This study uses linear regression models including ordinary least squares (OLS), fixed effect (FE) and random effect (RE) models. In addition, the tests are also conducted to select the appropriate model. In this study, the company's profitability is measured by return on assets (ROA). The results of the study show that economic growth has a positive impact on profitability; leverage, company size and inflation have a negative impact on profitability, while revenue growth rate and current ratio do not affect the profitability of the business.

Keywords: profitability, agriculture, panel data, ROA

1. Introduction

Profit is a key indicator of a company's financial performance. It is typically measured by return on assets (ROA), which is the net income divided by total assets. In the context of Vietnam's gradual integration into the global economy, it is important for businesses to increase profitability. This is essential not only for the survival of businesses but also for the development of the industry and the national economy as a whole. The agricultural sector is a promising sector with a large share of agricultural activity and plays an important role in economic activities and economic growth. This study aims to investigate the factors that affect the profitability of 30 listed agricultural companies in the Vietnamese stock market during 2020-2022. Although the determinants of business profitability have been experimentally studied worldwide, agricultural businesses in Vietnam have not received much attention due to the nascent nature of this market. Moreover, research from other industries cannot be directly applied to the agricultural sector due to differences in agricultural characteristics (Izedonmi & Abdullahi, 2011). To address this gap, this study investigates whether macroeconomic factors and firm characteristics are related to profitability, measured by the return on assets (ROA) and return on equity (ROE) of listed agricultural enterprises in Vietnam. Thus, the study provides additional evidence on the impact of macroeconomic factors and firm characteristics on the efficiency of agricultural production and business in Vietnam. Given the importance of profitability for agricultural businesses and the national economy, it is necessary to study the factors that affect profitability to improve the competitiveness of agricultural businesses. Several studies have explored the impact of the factors affecting the profitability of agricultural companies. In this research, the author reviews the device literature into different content.

1.1. Theoretical Framework

Profitability in business operations: Profitability is the outcome of production and business activities, reflecting the efficiency of a company (Firm) and is a key indicator of interest to financial information users such as managers, investors (Investors), and creditors. However, considering only the quantity aspect of profitability is insufficient; it is necessary to consider the quality of that profitability.

This means that it is necessary to examine whether the profit declared by the company is sustainable, stable, and derived from the company's business activities or if it is merely a number enhanced by accounting tricks.

In Vietnam, the purpose of profit manipulation is to minimize corporate income tax expenses and create a favorable image of the company to attract external investment. Therefore, when there is an opportunity, managers adjust profits according to their subjective desires.

This action will somewhat lead the information users to misjudge the results of the company's business operations and subsequently make erroneous decisions. Therefore, researching the quality of profit and the impacting factors to identify



which companies have good income quality and which factors have positive and negative impacts on management and investment decisions are essential in the current context.

Resource-based view. Wernerfelt's (1984) resource-based view explains the relationship between a firm's activities and its internal resources. Theory suggests that internal resources provide competitive advantages for firms to enhance operational efficiency (Wernerfelt, 1984). To maintain the sustainability of these competitive advantages, Barney (1986) and Mahoney and Pandian (1992) argue that resources must meet four criteria: (1) high value, (2) rarity, (3) unimitability, and (4) nonsubstitutability. The resource-based view is fundamental to this study because it helps describe the influence of internal characteristics, such as scale and financial structure, on a firm's profitability.

Capital structure theories. The pecking order theory and the trade-off theory provide two different explanations for the impact of leverage on firm activities. The pecking order theory (Myers, 1984) suggests a hierarchy of financing, prioritizing internal sources over external ones. Theory argues that raising capital from external sources can be costly due to the added cost of compensating for information asymmetry between lenders and borrowers (Baskin, 1989). This theory is supported by the research of Titman and Wessels (1988) and Shyam-Sunder and Myers (1999).

On the other hand, the Trade-off Theory of Capital Structure (Myers & Majluf, 1984) supports the benefits of debt in firm finance, claiming that the tax shield from debt makes it cheaper for companies to raise capital. The research of Marsh (1982) and Hovakimian et al. (2001) has supported this theory. In conclusion, although these two theories are opposing, they both help explain and predict the impact of debt costs on operating costs and, subsequently, profit potential based on a firm's financial structure.

Macroeconomic hypothesis. The macroeconomic hypothesis focuses on describing the relationship between macroeconomic factors and business activities. This hypothesis is based on the assumption that macroeconomic variables, such as the GDP growth rate, interest rate, and inflation rate, interact with and affect a firm's operations (Mwangi, 2013). For example, Fama and Schwert's (1977) research demonstrated a reciprocal relationship between inflation rates and annual interest rates. This study builds upon this hypothesis and follows economic reasoning that everything is interdependent (Muchir, 2012).

Push cost theory. In 1767, James Steuart proposed the first theory of the push cost, explaining the inflation resulting from the increase in costs and competition.

Increasing wages demanded by unions will increase production costs; thus, companies must increase product prices to achieve their expected profit margins (Steuart, 1767). At this point, price increases in some industries, especially those supplying inputs to others, will create similar price trends in downstream industries and have a ripple effect on the entire economy (Totonchi, 2011). At a reasonable level, increasing inflation stimulates production business activities (Bui et al., 2020). However, when inflation is uncontrolled and sharply increases, people's purchasing power will be negatively affected, and this may even lead to economic recession. Based on this theory, inflation always significantly affects the operating costs of business production and the purchasing power of people, thus directly affecting a firm's profit potential.

Monetary theory. Monetary theory explains the government's role in controlling economic activity through money supply channels, starting from banking channels (Stiglitz et al., 2003). There are two main ways monetary policy can impact business operations: through changes in required reserve ratios and interest rates (Stiglitz et al., 2003). First, when the required reserve ratios change, the money supply to the market will be affected inversely: an increase in the required reserve ratios will limit the lending capacity of banks, thereby reducing the money supply. Second, when interest rates change, the costs of borrowing also fluctuate in the same direction. This means that when interest rates rise, the costs of paying interest on loans become more burdensome, affecting a company's costs and decisions to expand production on borrowed capital. Through these two channels, monetary policy directly affects business profitability (Adrian & Shin, 2010).

Purchasing power parity theory. The purchasing power parity theory states that the value of identical goods depends on the currency value of that country based on the assumptions that transaction costs do not exist, goods traded are identical, and there are no barriers (Cassel, 1918). When purchasing power is equivalent across countries, the exchange rates between their currencies will be in equilibrium. This illustrates that the strength of a currency has significant implications for the costs and revenues of a nation's import and export activities.

1.1.1. CAPM Model

The Capital Asset Pricing Model (CAPM) was developed by Sharpe (1964), Lintner (1965), and Mossin (1966) based on the Markowitz portfolio selection model developed by Harry Markowitz (1959). Fisher Black (1972) developed another version of the CAPM, known as the black CAPM, which does not include the assumption of the existence of a risk-free asset. This model is more suitable for empirical testing and helps the CAPM to be more widely accepted.

In Markowitz's model, investors view each different investment as represented by a probability distribution of expected returns over a few holding periods. Investors always maximize their utility in a given period. Investors assess the risk of a portfolio based on the variance of the expected return. Investors base their decisions on the independent decisions of expected return and risk, so their utility function is an equation of expected return and variance (standard deviation) of return. With a given level of risk, investors prefer a higher return to a lower return. Similarly, with a given expected return

level, investors prefer less risk to more risk. Markowitz measures risk through variance or standard deviation with the assumption that the return distribution is normally distributed.

1.1.2. Fisher's interest rate theory

Fisher's interest rate theory is essential for the inflation-targeting framework. This theory is the basis for the idea that monetary policy should focus primarily on managing inflation expectations in an effort to keep real interest rates stable. This is aimed at promoting savings and investment. The concept of capital investment in Fisher's theory can be traced back to the emergence of *The Nature of Capital and Income* (1906) and *Interest* (1907), a concept that is very important in Fisher's theory (1930). Fisher's basic assumption is that all capital circulates in the economy and is fully utilized in the production process. Therefore, with the necessary real interest rate, any expected increase (or decrease) in the inflation rate will lead to an increase (or decrease) in nominal interest rates through the difference between aggregate income in the future and in the present. Therefore, if in a period ($t = 0$) the economy is in full employment equilibrium with no expected inflation, then suddenly in period ($t = 1$), the central bank expects to increase the money supply in time so that there is expected inflation and aggregate real income to grow at a faster rate than the expected real amount to be repaid.

1.2. Overview of Previous Research

Around the world and in Vietnam, research on the factors influencing company profitability has been conducted by various authors in different economic contexts and regions. Below is a summary of some research findings on this topic in various industries.

1.2.1. Company profitability

Company profitability measures earnings over the years of operation. According to Bauer (2004), companies with higher profitability tend to have greater leverage to shield their income from taxes. This perspective suggests that many profitable companies intentionally use more debt as a disciplinary measure for managers. Empirical evidence from previous studies shows a negative relationship between capital structure and profitability (Jordan & ctg, 1998; Mishra & McConaughy, 1999), but Petersen & Rajan (1994) reported a positive relationship between capital structure and profitability.

Research by Diaz (2017) on 47 agricultural companies listed on the Indonesia Stock Exchange from 2010 to 2014 and Safarova (2010) on 76 companies listed on the New Zealand Stock Exchange during the period 1996-2007 both demonstrated a positive impact of revenue growth on profitability.

1.2.2. Company Growth

Companies with aspirations for future expansion require larger capital commitments, forcing them to assume financial debt. Marsh (1982) found that high-growth companies tend to have relatively higher debt ratios. According to Myers (1977), companies with high growth opportunities should use more equity in their financing because higher-leverage companies may overlook more profitable investment opportunities. Some studies, such as Kester (1986), report positive relationships, while others show that high-growth companies use less debt (Stulz, 1990; Rajan & Zingales, 1995).

Research by Ahmad and ctg (2015) on 18 cement manufacturing companies from 2005 to 2010, Safarova (2010) on the New Zealand Stock Exchange, and Selcuk (2016) on 302 companies listed on the Borsa Istanbul stock exchange from 2005 to 2014 all showed that financial leverage has an inverse relationship with profitability. However, Burja (2011) found a positive impact of financial leverage on profitability for a Romanian chemical company from 1999 to 2009.

In Vietnam, studies by Trang (2020) on the Ho Chi Minh City Stock Exchange and Hanoi Stock Exchange, Toan (2016) on the Ho Chi Minh City Stock Exchange, Hang & Linh (2020) on 27 agricultural companies listed on the Ho Chi Minh City Stock Exchange from 2010 to 2019, Van and Nga (2018) on 42 construction material production companies listed on the Vietnam Stock Exchange from 2012 to 2016, and Ngoc & ctg (2020) on 20 oil and gas companies listed on the Vietnam Stock Exchange from 2014 to 2018 all showed an inverse relationship between financial leverage and company profitability.

1.2.3. Company size

The size of a company has been considered a specific characteristic that determines its capital structure. Theoretical perspectives differ, with Bauer (2004) suggesting that size has no impact on leverage, while Rajar & Zingales (1995) argue that larger companies tend to be more diversified. Empirical evidence suggests a positive relationship between company size and capital structure in some studies, such as Barclay & Smith (1996) and Al-Sakran (2001). These studies found that larger companies tend to use more debt, while smaller companies are more likely to use equity. However, other studies, such as Caesar & Holmes (2003) and Esperanca & ctg (2003), have found a negative relationship between company size and short-term debt ratios. Ferri & Jones (1979) concluded that company size affects the capital structure of firms but not necessarily in a positive way.

According to studies by Diaz (2017) on the Indonesia Stock Exchange, Bolek & ctg (2012) on the Warsaw Stock Exchange, Azhar & Ahmed (2019) on the Pakistan Stock Exchange's top 10 textile companies from 2012 to 2016, Selcuk (2016) on the Borsa Istanbul stock exchange, and Safarova (2010) on the New Zealand Stock Exchange, all show a positive impact of company size on profitability.

In Vietnam, studies by Toan (2016) and Hang & Linh (2020) on the Ho Chi Minh City Stock Exchange, Van and Nga (2018) and Ngoc & CTG (2020) on the Vietnam Stock Exchange all showed a positive impact of company size on profitability. However, Trang (2020) found an inverse relationship between company size and profitability on the Ho Chi Minh City and Hanoi Stock Exchanges.

1.2.4. Current Liquidity Ratio

The current liquidity ratio is one of the most commonly used measures of liquidity (Czekaj & Dresler, 2001). It provides an overview of a company's liquidity and serves as a starting point for analysis. It determines the extent of current assets, including short-term debt, and the potential of a company to meet its current obligations through the liquidation of current assets. A higher current ratio indicates a greater ability to do so.

Research by Diaz (2017) on the Indonesia Stock Exchange showed an inverse relationship between the current liquidity ratio and profitability. In contrast, Trang (2020) found a positive impact of the current liquidity ratio on profitability on the Ho Chi Minh City and Hanoi Stock Exchanges.

1.2.5. Economic Growth Rate

Bolek and Ctg's (2012) study on 44 construction companies listed on the Warsaw Stock Exchange from 2000 to 2010 revealed a positive impact of revenue growth on profitability. In Vietnam, studies by Trang (2020) on 55 agricultural companies listed on the Vietnam Stock Exchange and Hanoi Stock Exchange from 2010 to 2018 and by Toan (2016) on 35 Vietnamese agricultural companies from 2010 to 2014 both showed a positive impact of the economic growth rate on profitability.

1.2.6. Inflation rate

Odusanya & ctg's (2018) study of 114 companies listed on the Nigerian Stock Exchange from 1998 to 2012 revealed an inverse relationship between the inflation rate and profitability. In Vietnam, Trang's (2020) study on the Vietnam Stock Exchange and Hanoi Stock Exchange showed a positive impact of the inflation rate on profitability.

These findings illustrate the complex relationship between various financial and economic factors and company profitability, with some factors showing consistent effects across studies, while others exhibit varying impacts depending on the context and industry.

2. Materials and Methods

In previous studies, the profitability indicator used predominantly has been return on assets (ROA). The independent variables affecting a company's profitability include the revenue growth rate, company size, financial leverage, the current payment ratio, and the inflation rate. Furthermore, the economic growth rate is added as a macroeconomic indicator that is predicted to influence the profitability of agricultural companies in Vietnam.

Therefore, the research model is estimated using the following equation:

$$ROA_i = \beta_0 + \beta_1GROWTH_i + \beta_2LEV_i + \beta_3SIZE_i + \beta_4CR_i + \beta_5GDP_i + \beta_6INF_i + \epsilon_i$$

Dependent Variable:

Return on Assets (ROA)

Independent Variables

Revenue Growth Rate (GROWTH)

Financial literacy (LEV)

Company size (SIZE)

Current Payment Ratio (CR)

Gross domestic product (GDP)

Inflation rate (INF)

Data Sources: The study utilizes data from audited financial reports published on the websites of 30 agricultural companies listed on the Vietnam stock market from 2020 to 2022. Based on the collected data, the authors calculated various data variables. Additionally, data on the economic growth rate (GDP) and inflation rate (INF) were obtained from the General Statistics Office of Vietnam (Table 1).

Table 1 Statistics of the Variables Used in the Research Model.

Variable Name	Symbol	Calculation Method	Prior Research Authors
Return on Assets	ROA	Profit/Total Assets	
Revenue Growth Rate	GROWTH	[Revenue for year t - Revenue for year (t-1)]/Revenue for year (t-1)	Diaz (2017) Safarova (2010)
Financial Leverage	LEV	Total Debt/Total Assets	Burja (2011) Ahmad & ctg (2015); Safarova (2010); Selcuk (2016); Trang (2020); Ngoc & ctg (2020); Hang & Linh (2020); Toan (2016); Van & Nga (2018)
Company size	SIZE	Logarithm (Total Assets)	Diaz (2017); Safarova (2010); Selcuk (2016); Bolek & ctg (2012); Ngoc & ctg (2020); Hang & Linh (2020); Toan (2016)
Current ratio	CR	Short-term Assets/Short-term Liabilities	Trang (2020) Trang (2020) Diaz (2017); Van & Nga (2018)
Gross domestic product	GDP	Data from the Central Statistics Office	Bolek & ctg (2012); Trang (2020); Toan (2016)
Inflation rate	INF	Data from the Central Statistics Office	Trang (2020) Odusanya & ctg (2018)

Note: (+) indicates a positive impact; (-) indicates a negative impact.

2.1. Regression Methods, Data Panel, and Tests

This research employs quantitative methods using panel data, including ordinary least squares (OLS), the fixed effects model (FEM), and the random effects model (REM). Subsequently, the study used tests to determine the appropriate model. After selecting a suitable research model, any flaws in the model, such as heteroscedasticity and autocorrelation, are examined. In case of model flaws, the study will utilize the generalized least squares (GLS) method to rectify them.

3. Results

Table 2 presents descriptive statistics, including the mean, standard deviation, and minimum and maximum values of the variables included in the model. Table 2 shows that, on average, the companies in the sample have a return on assets (ROA) of approximately 5%, a revenue growth rate of approximately 7% per year, a financial leverage of approximately 5.7%, and a current ratio of approximately 2.35.

Table 2 Summary of Statistics for the Research Variables.

Variable	Obs	Mean	Standard Deviation	Minimum value	Maximum value
ROA	155	0,062084	0,05046	-0,12224	0,28891
GROWTH	155	0,734438	2,89522	-0,97055	24,6447
LEV	155	0,576270	0,16156	0,19277	0,84776
SIZE	155	15,95575	1,33719	13,40000	19,9988
CR	155	2,357881	1,73238	0,49990	12,9938
GDP	155	0,06996	0,01583	0,02910	0,07008
INF	155	0,03442	0,00826	0,02310	0,04074

Source: Calculated Results.

It can be observed that in the context of general export conditions not showing significant breakthroughs, the stocks of many agricultural product categories have become bright spots. Several have experienced good growth, while others have recorded lower declines compared to the overall market. This is likely due to the high export value of agricultural products, which approached the "billion-dollar" mark in the first quarter. According to data from the General Department of Customs, Vietnam's goods export turnover in the first quarter of 2023 is estimated to be greater than USD 79.3 billion, a decrease of 11.9% compared to the same period last year. However, rice and vegetables are two rare products that have maintained both production and export growth rates since the beginning of 2023. In the first three months of the year, Vietnam's rice exports totaled nearly 1.9 million tons, worth nearly USD 982 million, an increase of 34% compared to the same period. Moreover, vegetable exports also achieved impressive 16% growth, with a value of USD 984 million. It is noteworthy that rice exports in the first quarter of 2023 reached the highest level in six quarters, while vegetable exports recorded the highest value in seven quarters.

Cassava starch production is not a prominent industry in the market. However, the cassava industry has recently experienced good growth and is considered a "billion-dollar" agricultural export product of Vietnam (in 2022). Moreover, sugar prices surged to their highest level over the decade due to concerns about global supply shortages, which has



supported stock prices. On the other hand, animal feed ingredient prices have gradually cooled, and the expectation of reduced animal feed taxes has also opened up profit growth prospects for livestock businesses, positively impacting stocks in this sector. VNDirect states that global rice demand will remain high in 2023 due to political and economic instability, along with unresolved conflicts between Russia and Ukraine pushing up the demand for rice reserves. Rice export prices are expected to continue to rise in 2023.

The analysis group believes that global sugar prices in the first six months of 2023 will be supported by lower-than-expected sugar production in India and unfavorable weather affecting sugar production in Europe. The price of Vietnamese sugar is expected to follow the trend of global sugar prices. According to SSI Research, China's reopening is believed to catalyze the seafood industry in 2023, but additional time is needed to assess the specific impacts of this reopening. The catfish industry is expected to benefit the most, as China is Vietnam's largest catfish export market. Moreover, Agriseo Research expects that pork prices may reach a minimum and recover in 2023, as the demand for food increases with the recovery of the tourism and service sector in 2023, and supply from small household farms decreases significantly after a long period of losses due to sharply rising animal feed prices, while pork prices remain low.

Despite reaping significant benefits and having promising prospects in the agricultural sector, VNDirect still issues warnings for the sugar and rice sectors. For the rice industry, India's lifting of its ban on rice exports will create competitive pressure on Vietnamese rice plants and reduce rice export prices. Crop diversification and salinity intrusion may affect rice cultivation areas. A high price of fertilizers affects farmers' income and may lead to a decrease in rice cultivation areas as they switch to other crops. Moreover, Vietnamese rice will have to compete with Thai rice in 2023. Sugar companies also need to consider certain risks from uncontrolled trade fraud or smuggling, which can create price competition in the domestic sugar market. Another challenge is the risk of wildfires due to drought in many sugarcane-growing areas, which may affect the quality and quantity of sugarcane.

3.1. Correlation Matrix

In Table 3, the independent variables LEV, SIZE, GDP, and INF have an inverse effect on ROA. On the other hand, the other independent variables have a direct effect on ROA. The largest correlation coefficient in the model is 0.5054 <0.8, so the model does not exhibit multicollinearity.

Table 3 Correlation Matrix between the Variables in the Research Model.

	ROA	GROWTH	LEV	SIZE	CR	GDP	INF
ROA	1,0000						
GROWTH	0,1123	1,0000					
LEV	-0,1373	0,0303	1,0000				
SIZE	-0,2408	-0,0049	0,0979	1,0000			
CR	0,2741	-0,0448	-0,1585	-0,3057	1,0000		
GDP	-0,0222	-0,0748	0,0187	-0,0582	0,0950	1,0000	
INF	-0,0333	0,0448	0,0066	-0,1198	0,1660	0,5054	1,0000

Source: Calculated Results.

3.2. Regression Results

Model testing showed that the OLS model was not suitable. Therefore, the Hausman test was used to choose between the fixed effects model (FEM) and the random effects model (REM). The test showed that the REM model is superior to the FEM model. After applying the regression methods, the model exhibits the shortcomings of heteroscedasticity and autocorrelation. The group used the GLS model to address these issues to obtain the most stable results.

Table 4 shows that the variance inflation factor (VIF) for all variables is less than 10, and the average VIF is 1.18, indicating the absence of multicollinearity issues.

For the dependent variable (ROA), after applying the generalized least squares (GLS) method to address the issues of autocorrelation and heteroscedasticity, the regression results show that the leverage (LEV), company size (SIZE), and inflation rate (INF) have a significant and negative impact on profitability (ROA) at the 1% significance level. Additionally, the study identifies a positive relationship between economic growth (GDP) and profitability (ROA) at the 1% significance level. Moreover, the variable growth rate (GROWTH) and current ratio (CR) do not have significant impacts on profitability (ROA).

These results can be explained as follows:

Leverage (LEV): The negative impact of leverage on profitability (ROA) for agricultural companies is significant at the 1% level. These findings align with previous research conducted by Ahmad et al. (2015), Safarova (2010), Selcuk (2016), Trang (2020), Ngọc et al. (2020), Hằng and Linh (2020), and Toản (2016). This finding suggests that companies with high levels of debt may face difficulties in improving their profitability. Hence, they need to efficiently utilize borrowed capital to enhance profitability.



Table 4 Regression Results of the Research Models.

Variable	VIF	Dependent variable ROA			
		OLS	FEM	REM	GLS
GROWTH	1,12	0,00322	0,00362**	0,00245**	0,000728
LEV	1,13	-0,0354	-0,278***	-0,0761**	-0,0762***
SIZE	1,23	-0,00752**	0,00986	0,00647	-0,00537***
CR	1,25	0,00772***	0,00537	0,0000878	0,000354
GDP	1,33	0,00338	0,00389	0,00255	0,00221***
INF	1,34	-0,01254**	-0,00618	-0,00942**	-0,00615***
Cons		0,287***	0,0285	0,213**	0,179***
N		155	155	155	155
R2		0,155	0,177	0,188	
Significance		F(6, 143)= 3,99 Chi2(26) = 43,77	F(6, 114)= 3,47	Wald chi2(6)= 16,59	Wald chi2(6)= 48,99
White Test		Prob>chi2 = 0,0169			
Wooldridge Test		F(1, 29) = 12,567 Prob>F = 0,0012			
Hausman Test		Chi2(6) = 12,88 Prob>F = 0,0595			
F Test		F(29, 114) = 6,65 Prob>F = 0,0000			
LM Test		Chibar2(01) = 62,89 Prob>chibars = 0.0000			

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

Source: Calculated Results.

Company Size (SIZE): The negative impact of company size on profitability (ROA) for agricultural companies is significant at the 1% level. This result is consistent with the findings of Trang (2020) and opposes the results of studies by Diaz (2017), Safarova (2010), Selcuk (2016), Bolek et al. (2012), Ngoc et al. (2020), Hang and Linh (2020), and Toản (2016). This finding implies that increasing the size of companies may lead to decreased profitability.

Economic Growth (GDP): The positive impact of economic growth (GDP) on profitability (ROA) for agricultural companies is significant at the 1% level. This result is consistent with the findings of Bolek et al. (2012) and Trang (2020). This suggests that when the GDP growth rate increases, it indicates an improved standard of living for the population, leading to increased demand for purchasing or constructing homes and agricultural products. As a result, agricultural companies can thrive, and their profitability improves. This encourages companies to manage their inventory efficiently and subsequently enhance profitability.

Inflation Rate (INF): The negative impact of the inflation rate on profitability (ROA) for agricultural companies is significant at the 1% level. This result aligns with the findings of Odusanya et al. (2018). This indicates that high inflation rates can have adverse effects on a company's profitability.

4. Discussion

Profit is an essential indicator in financial reporting and serves as a tool for assessing a company's future performance and determining its value. Therefore, a company's profit significantly influences decisions made by various stakeholders, such as shareholders, creditors, banks, policy makers, suppliers, and competitors. A company is considered profitable if its financial reports accurately reflect the efficiency of its business operations. This study examined the factors affecting the profitability of publicly traded agricultural companies on the Vietnam Stock Exchange (HOSE) during the period 2020-2022.

This study employed linear regression models, including the ordinary least squares (OLS) method, fixed effects model (FEM), and random effects model (REM). Additionally, Hausman tests were conducted to determine the appropriate model between the fixed effects model (FEM) and random effects model (REM). The generalized least squares (GLS) method was also utilized to address any model shortcomings. The results identified leverage, economic growth, company size, and the inflation rate as significant factors influencing a company's profitability.

Based on the identification of these factors affecting the profitability of agricultural companies in Vietnam, this article proposes several solutions to enhance the profitability of publicly traded agricultural companies on the Vietnam Stock Exchange (HOSE).

5. Conclusions

The findings indicate that macroeconomic factors have a significant impact on the profitability of agricultural companies. Therefore, relevant authorities should formulate appropriate policies to stabilize and improve macroeconomic conditions, including economic growth and specific inflation rates. Companies should focus on expanding their scale of



operations, as larger companies tend to gain a larger market share and establish a stronger position in the market. Moreover, companies should prudently utilize borrowed capital to avoid negatively affecting their profitability.

Profitability is a crucial indicator of the achievement of the ultimate goal of financial management. Recent academic literature has identified macroeconomic drivers and firm characteristics as factors that can determine profitability (Nanda & Panda, 2018; Bui et al., 2020; Dioha et al., 2018; Mukras, 2015). This study examines the relationships between the macroeconomic indicators, internal firm factors, and profitability, measured by ROA and ROE, of listed agricultural companies in Vietnam. The growth rate of revenue (GROWTH), leverage (LEV), firm size (SIZE), the current ratio (CR), the economic growth rate (GDP), and the inflation rate (INF) are used as independent variables for ROA and ROE.

The regression results show that macroeconomic factors, as indicated, have a more significant impact than firm-specific factors. All three factors, the GDP growth rate (GDPR) and the inflation rate (INF), significantly influence either ROE or both profitability measures. Regarding firm-specific factors, the study still finds that they have a significant impact on firm profitability, although only leverage (LEV) has a strong negative effect on both ROA and ROE. The other two factors, firm size (SIZE) and the current ratio (CR), do not have statistically significant effects.

Managerial implications the results of this study can lead to the following recommendations for policy makers and business managers. Since financial leverage significantly impacts firm profitability, managers should consider this indicator when making decisions. According to the results, leverage has a negative impact on ROA; therefore, business managers should strive to limit the leverage ratio in the financial structure. Finally, although firm size and liquidity do not significantly impact ROA or ROE, business managers should still pay adequate attention to them.

The results regarding macroeconomic indicators show that policy makers can reduce the burden of stabilizing annual interest rates, at least for the consumer goods sector, as the research reflects a positive relationship between interest rates and profitability. The government and relevant agencies should also maintain the sustainability of high GDP growth rates and maintain inflation rates at a reasonable level, as these indicators have a positive impact on production growth and the stability of import resources.

Limitations of the study The limitations of this study include its focus on a limited number of listed agricultural companies in Vietnam. Furthermore, the research only covers data within a 3-year period, from 2020 to 2022. Finally, some results related to firm size, liquidity, and interest rates were found to contradict the theory as well as previous experimental studies. Therefore, further in-depth research is needed to examine the overall relationship between macroeconomic indicators and firm characteristics on a firm's profit potential, especially in the agricultural sector in Vietnam.

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