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Determinants of financial stability on real estate companies in the Indonesian stock exchange from 2012 – 2022

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ABSTRACT

This study aims to empirically analyze the impact of profitability (PRFT), leverage (LEVG), liquidity (LIQD), firm age (FAGE), interest rate (INTR), firm value (FVAL), firm size (FISZ), and COVID-19 (COVD) on the financial stability (FSTA) of real estate companies listed on the Indonesia Stock Exchange from 2012 to 2024. Using secondary data, the research adopts a purposive sampling method to select companies based on predefined criteria, with the final sample drawn from 83 registered real estate firms. The F-statistic test was performed, and the results were identical for Model 1 and Model 2, confirming that all independent variables—PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and COVD collectively influence financial stability (FSTA). In Model 1, the individual significance test (t-test) revealed that LEVG, LIQD, FAGE, INTR, FVAL, and FISZ significantly affect FSTA, while PRFT and COVD do not. Conversely, in Model 2, PRFT, LEVG, LIQD, FAGE, FVAL, and FISZ were found to significantly impact FSTA, whereas INTR and COVD showed no effect. Finally, in Model 3, PRFT, LEVG, and LIQD do not mediate their respective effects on FSTA. The research model remains robust despite two adjustments to the independent variables. The first adjustment incorporates the Financial Stability Index (FISI), while the second adjustment still incorporates FISI, but COVD is removed.

Contribution/Originality: This study provides new perspectives on financial stability research for real estate companies in Indonesia, particularly concerning key performance indicators such as profitability, leverage, liquidity, firm size, and firm value, as well as their connection to capital structure.

1. INTRODUCTION

In 2008, the financial crisis was largely attributed to a deficiency in financial stability, which is contingent upon sufficient liquidity. The failure of Lehman Brothers in that year was primarily due to inadequate liquidity stemming from a mismatch between its assets and liabilities. The major cause of the 2008 financial crisis was the subprime mortgage crisis in 2007. Similarly, Jing et al. (2021) characterized the collapse of Evergrande, a prominent Chinese real estate developer, as China's parallel to the Lehman Brothers incident. By June 2021, Evergrande disclosed debts amounting to approximately RMB 2 trillion, which included off-balance sheet liabilities. This debt accounted for 2% of China's GDP, and the company employed around 200,000 people. Although Evergrande oversaw more than 800 construction projects, financial difficulties led to the halting of over half of these initiatives.

Evergrande Real Estate Group Limited, previously known as Hengda Group, was the second-largest real estate firm in China by sales and held the 122nd position in the Fortune Global 500 (de Oliveira Almeida et al., 2023). However, on December 3, 2021, the company publicly declared its default on debt obligations (Linyu, 2022). The downfall of Evergrande was primarily due to the mismatch in the maturity of its assets and liabilities, culminating in a significant liquidity crisis. In 2021, Evergrande was perceived as relatively smaller in terms of net asset value (NAV), which was severely impacted by an alarming debt-to-equity ratio of -545%. The NAV plummeted by 239%, resulting in a negative total of US$74.43 billion, indicating that the company's liabilities vastly outstripped its assets. As a result of a high debt level five times larger than its equity, the firm value of Evergrande decreased significantly, and ultimately, there was no financial stability.

The net value of an entity and determined as the total asset minus the total liabilities, is a reflection of NAV. According to Rehkugler, Schindler, and Zajonz (2012), the metric represents an indicator of the intrinsic value of a real estate company, especially for those engaged in property ownership and leasing. However, according to Chen (2023), companies with future substantial growth are often valued higher than NAV suggests. Aside from NAV, some investors consider that Market Capitalization reflects the fair value of a company. According to Fernando (2023), the formula for market capitalization is calculated by multiplying the current market price per share by the total number of outstanding shares.

Evergrande favored debt over equity, which is part of its strategy, leading to a significant decrease in both NAV and market capitalization. Since Evergrande is highly dependent on debt, there is financial instability, which is causing Evergrande to default on its obligations due to liquidity issues. According to Myers (1984), utilizing debt up to the best level can help reduce costs arising from financial turmoil while providing tax benefits through interest deductions. Large corporations, such as Evergrande, often favor debt financing over internal funds for their projects, primarily due to the substantial assets available for collateral. However, Miller (1988) supported the arguments of Modigliani and Miller (1963), emphasizing that a company may face potential bankruptcy if debt is incorporated in its capital structure. The situation in Evergrande already aligns with the postulate of Modigliani and Miller (1963), which suggests that a higher debt level will increase the risk of bankruptcy. Although many business sectors faced difficulties during the COVID-19 pandemic from 2020 to 2022, the real estate sector was able to maintain a strong financial position. The COVID-19 pandemic was an unpredictable situation that impacted all companies worldwide, leading to extensive layoffs. Many organizations faced adverse economic conditions, struggling to remain operational and continue their activities. The World Health Organization (WHO) officially declared the coronavirus (COVID-19) outbreak a global pandemic in March 2020, which adversely affected the global economy and financial markets. Government-imposed lockdowns and travel restrictions curtailed economic activity, exacerbating the global economic crisis. Numerous nations, including Indonesia, experienced negative economic growth as a result of these adversities. COVID-19 has caused an adverse global economic downturn, with the International Monetary Fund forecasting that 95% of nations would face negative growth (Rahmah & Novianty, 2021). In response to the adverse impacts of COVID-19, the Federal Reserve took prompt action by enacting quantitative easing measures to acquire half a trillion dollars in Treasury securities and US$0.2 trillion in mortgage-backed securities in the first quarter of 2020 (Timiraos, 2020).

The World Bank (2016) suggests that financial stability is related to a robust financial system, where resource allocation and financial risk management are conducted effectively. A financial condition is considered stable if it can address imbalances in the financial situation that may emerge from adverse conditions. Economic growth in a country heavily relies on financial stability, as all financial activities within the real sectors are conducted through a financial platform (The World Bank, 2016). The Federal Reserve of the United States (2018) emphasizes that financial stability does not solely focus on preventing failures or shielding individuals and businesses from financial gains or losses; rather, it aims to establish a financial system that operates efficiently during both favorable and adverse economic conditions, capable of absorbing both positive and negative occurrences within the economy. This

ensures that the system's functionality remains intact despite such events. Jakubík and Teplý (2008) indicated that financial stability is indicative of a company's liquidity, highlighting that insufficient liquidity heightens the risk of bankruptcy. Savina (2020) asserted that the stability in financial system is the ultimate goal of financial analysis, reflecting a company's ability to sustain solvency while accounting for its reliance on investors and lenders, or its ratio of debt to equity.

According to Ujam, Okolie, and Sunday (2023) financial stability in a company needs to maintain operational levels and resist temporary economic difficulties. Numerous researches have demonstrated that an entity's value is predominantly influenced by the composition of debt and equity, and a company's value is often used to measure financial performance and is frequently linked with high profitability. High profitability provides liquidity, which ultimately strengthens financial stability (Aivazian, Ge, & Qiu, 2005; Berger & Di Patti, 2006; Detthamrong, Chancharat, & Vithessonthi, 2017; Kontesa, 2015; Santika & Kusuma, 2002; Suharli, 2006; Vătavu, 2015). These researches provide perspectives from theory and factual evidence on the connection between financial stability and capital structure, especially during financial crises (Altman, 1968; Campbell, Hilscher, & Szilagyi, 2008; ElBannan, 2021; Nguyen, Le, Vu, & Tran, 2023).

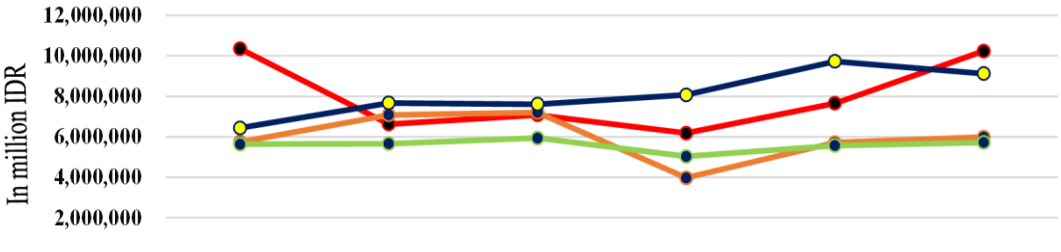
Debt and equity serve primarily as funding sources for a company and represent the composition of its capital structure. A company will utilize debt or equity to finance its routine business and investments (Nawaz, Ali, & Naseem, 2011; Priya, Balasundaram, & Pratheepan, 2015; Siddik, Kabiraj, & Joghee, 2017). According to Vătavu (2015), the best shape of capital structure can help lower the cost of funds, which will boost market value per share, reflecting the company's overall worth.

Ahmed et al. (2024) contended that excessive reliance on debt increases financial risk, while a balanced capital structure can ensure financial stability by optimizing capital costs and managing financial obligations effectively. If a firm has an optimal capital structure, its value will increase accordingly because the company will be able to balance the benefits and disadvantages of debt and equity, thereby fostering financial stability (Ahmed et al., 2024; Priya et al., 2015).

Notwithstanding the negative impact of the COVID-19 pandemic on Indonesia's economy, real estate companies have shown strong performance. The pandemic caused disruptions to the global economy, primarily due to government-imposed lockdowns and travel restrictions, which limited human activities. López-Gutiérrez, Sanfilippo-Azofra, and Torre-Olmo (2015) argued that companies typically tend to reduce their investment during a financial crisis, especially those with limited opportunities, making them more likely to under-investment. Additionally, individual investors typically adopt "wait-and-see" approach during periods of financial crisis because they prefer to avoid risky investment and prioritize survival strategy (Ortmann, Pelster, & Wengerek, 2020). In contrast, the real estate sectors in Indonesia have shown unusual performance, with people continuing to purchase properties, including high-value properties.

These behaviors confused stock analysts, especially given the outstanding performance of the Big 4 Property Companies (PT Bumi Serpong Damai Tbk (BSDE), PT Pakuwon Jati Tbk (PWON), PT Ciputra Development Tbk (CTRA), and PT Summarecon Agung Tbk (SMRA)) during the COVID-19 pandemic. Their outstanding performance was a surprise for investors, as the economic conditions were not as favorable as expected during the pandemic.

This situation highlights a contrast between the expected decline in consumer spending during a financial crisis and the actual actions of consumers who continue to buy properties. The revenue performance of the Big 4 is as follows.



	2017	2018	2019	2020	2021	2022
BSDE	10,347,343	6,628,782	7,084,864	6,180,589	7,654,802	10,235,480
PWON	5,749,185	7,080,668	7,202,001	3,977,211	5,713,273	5,987,433
CTRA	6,442,797	7,670,405	7,608,237	8,070,737	9,729,651	9,126,799
SMRA	5,640,752	5,661,360	5,941,626	5,029,984	5,567,913	5,719,396

Figure 1. Revenue from Big 4.

Source: Website of each company.

Figure 1 highlights that the revenues of the Big 4 remained strong during the COVID-19 pandemic from 2020 to 2022. Specifically, BSDE reported revenues of Rp6.2 trillion, Rp7.6 trillion, and Rp10.2 trillion in 2020, 2021, and 2022, respectively. Similarly, PWON recorded revenues of Rp3.9 trillion, Rp5.7 trillion, and Rp5.9 trillion during the same period. CTRA's revenues were Rp8.1 trillion, Rp9.7 trillion, and Rp9.1 trillion, while SMRA achieved Rp5.0 trillion, Rp5.5 trillion, and Rp5.7 trillion for 2020, 2021, and 2022, respectively. These figures reveal an unusual trend, as most industries struggled during the pandemic, yet the real estate sector demonstrated resilience and strong performance despite the challenging conditions.

Financial instability is a threat to companies around the world. The absence of financial stability can lead to chaos in the economy. While some organizations have proactively implemented measures to prepare for possible financial disruptions, others have not taken similar precautions. During times of economic distress, widespread layoffs often result in job losses, increased unemployment rates, and ultimately, an economic crisis that adversely affects all sectors. To mitigate such situations, it is essential for companies to maintain financial stability, enabling them to withstand significant economic shocks. Research indicates that firms with strong financial stability are better equipped to navigate economic challenges (Chant, Lai, Illing, & Daniel, 2003; Ujam et al., 2023). Historically, much of the research on financial stability has focused on the banking sector and other industries (Al Salamat & Al-Kharouf, 2021; Hudaya & Firmansyah, 2023; Karim et al., 2022; Kharabsheh & Gharaibeh, 2022; Madi, 2016; Rubio-Misas, 2020; Vo, Nguyen, Quang-Ton Le, & Pham, 2019). Although Nguyen et al. (2023) has examined the relationship between financial stability and capital structure within the hotel industry, there remains a lack of studies specifically addressing real estate firms.

This research will focus on the financial stability of Indonesia's real estate industry. Previous studies have established a connection between capital structure and financial turmoil; however, they have not adequately investigated its relationship with financial stability (Abdioğlu, 2019; Fahlevi & Marlinah, 2018; Fredrick, 2018; Lee & Manual, 2019; Muigai, 2016). On an international scale, financial stability is seldom treated as a variable; rather, most studies emphasize the link between a company's performance in the financial area and capital structure, particularly in real estate companies (Feng & Guo, 2015; Ioana, 2020; Ngoc, Tien, Chau, & Le Khuyen, 2021; Yabs, 2015).

The connection between profitability, leverage, liquidity, firm age, interest rates, firm value, firm size, and financial stability in real estate companies will be examined by this research to fill the research gap. Although capital structure has frequently been explored in relation to financial performance, financial turmoil, and liquidity, there remains a research gap concerning its connection with financial stability in the real estate sector (Hasbi, 2015; Nishihara & Shibata, 2021; Supyan & Kuswanto, 2023; Suzulia & Saluy, 2020). The Trade-off Theory (TOT) and the Pecking Order Theory (POT) will be utilized to support this research.

According to Aini, Suherman, and Mardiyati (2022), TOT contended that a company can essentially have the optimal capital structure by balancing tax benefits from debt with potential financial turmoil costs, which include bankruptcy risk and agency costs, while POT opined that companies prioritize their funding sources to address challenges arising from information asymmetry, favoring internal financing first. Myers (1977) contended that POT suggests there is no single optimal capital structure, as companies prioritize a hierarchy of financing preferences. Megginson, Smart, and Gitman (2007) agreed with this argument, where companies tend to use internal financing rather than external financing. This preference explains why highly profitable companies often maintain low debt levels.

According to Basit and Irwan (2017), companies could improve their organizational performance if they have the best composition of capital structure between debt and equity. Seeman and Jacobson (2017) argued that funding generally originates from internal resources, debt, or equity, with TOT focusing on leveraging debt to maximize the use of tax shields. According to Myers and Majluf (1984), POT also supports the preference for funding hierarchies. The sequence of funding hierarchies begins with retained earnings, short-term loans, and then long-term loans. This sequence essentially prioritizes debt over issuing new equity. Asymmetric information between internal management and investors is expected to be reduced through these funding hierarchies. According to Myers and Majluf (1984) company can reduce information asymmetry by avoiding the issuance of new securities and relying on retained earnings. This method helps reduce the costs related to stock issuance, particularly in situations where there is a significant gap in information between internal managers and external stakeholders. Companies encountering significant information asymmetries should consider using debt as a tool to avoid the undervaluation of their equity.

Previous research on financial stability has largely concentrated on the banking sector and other industries. Notable studies by Madi (2016), Alfiano (2018), Vo et al. (2019), Rubio-Misas (2020), Al Salamat and Al-Kharouf (2021), Karim et al. (2022), Kharabsheh and Gharaibeh (2022), and Hudaya and Firmansyah (2023) have primarily focused on these areas. Although Nguyen et al. (2023) investigated financial stability within the hotel industry, there remains a scarcity of research specifically addressing the real estate sector. Although financial turmoil and capital structure are among the most-examined topics by scholars in Indonesia, their relationship with financial stability has not yet been specifically studied. Muigai (2016), Fredrick (2018), Fahlevi and Marlinah (2018), Abdioğlu (2019), and Lee and Manual (2019) have explored the relationship between capital structure and financial turmoil, but their research did not address financial stability.

Moreover, international research has typically related capital structure to financial performance rather than to financial stability in real estate firms. This is supported by research from Feng and Guo (2015), Yabs (2015), Ioana (2020) and Ngoc et al. (2021). In this research, financial stability will serve as the dependent variable to address existing research gaps. Profitability, leverage, liquidity, firm age, interest rates, firm value, and firm size will act as independent variables, and the relationships between these variables and financial stability will be examined. Determinants of financial stability in real estate companies have been relatively underexplored in previous studies. This research aims to investigate this underexplored area and understand how these determinants influence financial stability in real estate companies. The study will focus on real estate companies listed on the Indonesian Stock Exchange, covering the period from 2012 to 2022. A model will be developed to identify the determinants of financial stability for these companies and to clarify the connections between the independent variables and the dependent variable. The paper is organized as follows: Section 2 describes the theoretical framework; Section 3 reviews relevant literature; Section 4 discusses the methodology; Section 5 presents the findings and discussion; and Section 6 concludes with recommendations.

2. THEORETICAL FRAMEWORK

2.1. Trade-Off Theory (TOT)

TOT was initially launched in the research conducted by Modigliani and Miller (1958) and subsequently was refined by Kraus and Litzenberger (1973) and Myers and Majluf (1984). TOT explains how companies utilize debt up to an optimal level, wherein the tax shields from debt will compensate financial turmoil costs. Also, this theory examines the connection between a company's value and capital structure (Sudiyatno, Puspitasari, Suwarti, & Asyif, 2020). TOT contended that firm value increases as debt levels also rise until they exceed the optimal levels, after which the value starts to decline. High reliance on debt will result in high-interest debt and a high risk of default, which ultimately will undermine financial stability. According to Wijaya and Cen (2021), TOT contended that the capital structure of a company is primarily calculated by balancing the tax benefits and the costs arising from debt usage. TOT serves as a key principle in capital structure studies; this theory explains that a company can achieve the optimal level of debt if the marginal benefits equal its marginal costs. Companies can reach this level by adjusting their mix of debt and equity to maximize tax shields and minimize financial distress costs. However, researchers have yet to agree on a definitive set of benefits and costs that define this equilibrium (Yapa Abeywardhana, 2017).

Modigliani and Miller's proposition that capital structure is irrelevant has been challenged by Myers (1984), who used the TOT to address the "Capital Structure Puzzle." He argued that a moderate level of debt can help reduce financial turmoil costs, provide tax benefits, and improve liquidity. Conversely, excessive financial turmoil can hinder liquidity, leading to instability and difficulties in fulfilling obligations. Fama and French (2002) contended that a company can have the best shape of capital structure by compensating the tax benefits of interest expense of a loan against the costs associated with bankruptcy and agency problems.

Some studies suggested that the TOT is often used for bankruptcy analysis. One of the potential causes of bankruptcy is debt usage, where TOT encourages. Kraus and Litzenberger (1973), Scott (1977), and Kim (1978) argued that TOT is instrumental in understanding bankruptcy dynamics, suggesting that companies should carefully balance their debt levels to maximize the tax shields arising from debt while minimizing insolvency risk. As reliance on debt grows, the likelihood of bankruptcy also increases, particularly if there is insufficient cash in a company to fulfill its obligations and interest expenses, potentially leading to collapse and limiting future growth prospects (Kim, 1978). High growth expectations can increase the risk of bankruptcy, as pursuing growth typically requires significant financial resources (Myers, 1984; Serrasqueiro & Caetano, 2015). Although funding may be sourced from both debt and equity, growth does not inherently ensure adequate future cash flows. If a company heavily relies on debt for funding, it will bear high interest expenses, and substantial interest payments will be a critical factor for financial stability, as some portion of cash flow will be allocated for interest payments. If a company has no liquidity or sufficient cash to cover interest and principal payments, this condition can lead to financial turmoil and ultimately hamper future growth. Hackbarth, Hennessy, and Leland (2007) highlighted the significance of TOT in identifying optimal debt levels and explaining the structure of corporate debt. Their study explained that TOT effectively encompasses core aspects of corporate debt management and provides important perspectives for achieving a balanced and sustainable capital structure.

2.2. Pecking Order Theory (POT)

POT, first launched by Donaldson (1961) and subsequently fine-tuned by Myers and Majluf (1984), contended that basically, firms have a propensity to prioritize their financing in a specific hierarchy. Companies typically prioritize internal financing, especially retained earnings from operational activities, instead of an external source of funding. If an external source of funding is needed, companies typically choose debt as their first option, followed by issuing new equity (Wijaya & Cen, 2021). Additionally, POT suggests that highly profitable companies often carry lower debt levels because their profit can provide liquidity and stability and this condition will allow them to mainly

rely on internal funding sources (Hirdinis, 2019; Megginson et al., 2007). The basic principle of POT is rooted in the idea of asymmetric information between internal managers and external parties (Cotei & Farhat, 2009; Myers, 1984; Myers & Majluf, 1984). Myers and Majluf (1984) argued that if a company avoids issuing new securities and instead utilizes retained earnings for financing investments, information asymmetry can be minimized. Managers, who possess better knowledge of the company's value and risks than external investors, aim to prevent underinvestment by choosing funding sources less likely to be diminished in value by the market. These preferences influence decisions regarding the use of internal or external funding sources (Cotei & Farhat, 2009).

According to Myers and Majluf (1984), companies are more reliant on internal sources such as reserves and retained earnings before utilizing new debt, preferring debt over issuing new equity. This approach will maintain shareholders' value, as managers, prioritizing shareholders' interests, tend to refrain from issuing new shares at a discounted price. According to Myers (1977), POT inferred that there is no perfect shape of capital structure because companies often comply with a sequential hierarchy of financing choice. This view has been supported by Megginson et al. (2007), who emphasized that companies typically prioritize internal funding before considering an external financing scheme, aligning with the core principles of POT.

According to Shahar et al. (2015), TOT overlooks the impacts of information asymmetry. This shortcoming is subsequently addressed by POT, which emphasizes the conflicts between insiders and external investors resulting from asymmetric information. However, POT suggests that no optimal capital structure exists (Luigi & Sorin, 2009; Mostafa & Boregowda, 2014). POT opined that companies, which comply with a financing hierarchy, will prioritize internal financing first, followed by loans, and finally equity (Chen & Chen, 2011). Myers and Majluf (1984) elucidated that, under the POT framework, firms prioritize their sources of capital according to this established preference order. Due to varying levels of information available to the company and potential investors, firms tend to rely on retained earnings first, followed by loans, short-term loans first, then long-term loans, and they prefer loans over equity.

2.3. Explanatory Variables and Hypothesis Development

2.3.1. Financial Stability as Dependent Variable

Financial stability reflects a company's ability to maintain liquidity, which is crucial for reducing insolvency risk (Jakubík & Teplý, 2008). Dolgikh and Slepuhina (2019) emphasized that it is essential for consistent operations. A financially stable business enjoys benefits like better access to credit and reduced vulnerability to market fluctuations, contributing to sustainable enterprises that support national economies. Savina (2020) emphasized that financial stability involves assessing reliance on lenders and investors, often calculated by debt-to-equity ratio, and is also supported by stable operational performance. It must consider both current and future conditions for long-term viability. According to Drobyazko, Barwinska-Malajowicz, Slusarczyk, Chubukova, and Bielialov (2020), Financial stability is characterized by consistently generating income that exceeds expenditures, enabling effective fund allocation and supporting production and sales. This stability underpins overall resilience, allowing businesses to meet obligations and manage resources effectively. A financially stable organization gains a competitive advantage by attracting investments, securing loans, and recruiting talent. Jakubík and Teplý (2008) opined that companies with robust liquidity are less prone to default, emphasizing its significance as a financial stability indicator.

This research primarily focuses on financial stability as the dependent variable, examining its dynamics during financial turmoil caused by COVID-19 within Indonesian real estate companies. Although real estate products are considered expensive, real estate companies demonstrated robust financial performance during the COVID-19 pandemic, indicating that these products are well accepted by the market. Financial stability refers to a company's ability to maintain a steady financial position, which is crucial for its survival under any economic condition (Putri

& Lestari, 2021). It is closely connected to financial liquidity, as insufficient liquidity will raise bankruptcy risks (Jakubík & Teplý, 2008).

This research employs the Z-score, suggested by the World Bank for evaluating financial stability, rather than the Altman Z-score. The World Bank (2016) opines that Z-score is a common metric for assessing corporate financial health, prompting many researchers to use this method. The Z-score was originally developed in Roy (1952)'s research and is used as a statistical measure to determine a company's financial risk relative to the dataset's mean. According to Mare, Moreira, and Rossi (2017) in academic literature, insolvency is frequently defined as when the equity-to-asset ratio (EA) combined with the return on asset ratio (ROA) equals zero or less. The proxy for financial stability is as follows.

$$\text{Z-Score} = \frac{ROA + (\frac{Equity}{Assets})}{\sigma(ROA_t)}$$

2.4. Profitability as Independent Variable

According to Jasmani (2019), profitability represents the final outcome of policies and actions from a company. Profitability is often used as a financial health indicator. Robust cash flow and overall financial stability typically result from higher profitability.

Madushanka and Jathurika (2018) contended that companies with low profitability will face financial risk due to inadequate liquidity. Therefore, profitability is considered the independent variable to assess its connection with financial stability. The profitability ratio is often used to evaluate the ability of a firm to generate revenue (Kasmir, 2014; Moch, Prihatni, & Buchdadi, 2019; Sudana, 2015). High profitability will lead to high cash reserves and strengthen financial stability, which aligns with Madushanka and Jathurika's argument that an unprofitable company will face financial difficulties. The profitability ratio is as follows:

$$\text{Profitability} = \frac{\text{Net Income}}{\text{Total Assets}}$$

The hypothesis is as follows.

H_1: Profitability positively affects financial stability.

2.5. Leverage as Independent Variable

Nugraha, Sulastri, Nugraha, Puspitasari, and Putra (2020) argued that leverage is one of the best tools to evaluate a firm's assets, which are funded by a loan. Companies utilize leverage to finance operations (Margono & Gantino, 2021), which can strengthen profitability by enabling new revenue-generating initiatives. Higher profitability strengthens liquidity, as robust cash flow is a result of higher profitability, thereby enhancing financial resilience (Alkhatib, 2012).

A robust financial position provides stability. In this research, the influence of leverage on financial stability will be assessed. Leverage serves as the independent variable. The composition of debt and equity fundamentally constitutes leverage. Either debt or equity will be used as a funding source to finance the assets. Higher debt will lead to higher leverage. (Abubakar, 2015; Enekwe, Agu, & Eziedo, 2014). Leverage reflects how businesses fund their assets using debt and preferred stock (Daryanto, Samidi, & Siregar, 2018), often through loans or liabilities (Abubakar, 2015). Shareholder return and firm's market value are highly impacted by management decisions on leverage (Banafa, Muturi, & Ngugi, 2015). The proxy of leverage is as follows.

$$\text{Debt-Equity Ratio (DER)} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

The hypothesis is as follows.

H_2: Leverage negatively affects financial stability.

2.6. Liquidity as Independent Variable

Liquidity creates financial flexibility, allowing individuals and businesses to swiftly address unexpected expenses or opportunities. If a company has sufficient cash or liquid assets, it is easy to maintain financial stability without the need to liquidate long-term investments during difficult times. Liquidity is crucial for every company in order to meet short-term obligations (Beaver, 2020). This research assesses the influence of liquidity on financial stability. In this study, liquidity serves as the independent variable. The liquidity ratio is often used as a financial health indicator (Blessing & Sakouvogui, 2023; Saleem & Rehman, 2011). The proxy for liquidity is as follows.

$$\text{Current Ratio (CR)} = \frac{\text{Total Current Assets}}{\text{Total Current Liabilities}}$$

The hypothesis is as follows.

H_3: Liquidity positively affects financial stability.

2.7. Firm Size as Moderating Variable

According to Margono and Gantino (2021), larger companies have a better privilege of funding, which strengthens their financial stability. The impact of firm size on financial stability will be assessed. Firm size, as a moderating variable, is expected to moderate the relationships between profitability, leverage, and liquidity concerning financial stability. The proxy for firm size is as follows.

Firm Size = Log (Total Assets).

The hypotheses are.

H_{4a}: Firm size positively moderates the relationship between profitability and financial stability.

H_{4b}: Firm size positively moderates the relationship between leverage and financial stability.

H_{4c}: Firm size positively moderates the relationship between liquidity and financial stability.

2.8. Firm Value as Mediating Variable

According to Markonah, Salim, and Franciska (2020), the firm's market perception is essentially a reflection of the firm's value. A higher firm value will increase shareholder wealth, as it aligns with rising stock prices and overall company valuation (Tui, Nurnajamuddin, Sufri, & Nirwana, 2017). Profitability is one of the most significant contributors to increasing firm value while also providing financial stability for the company (Sudiyatno et al., 2020). Also, a high firm value signifies strong business performance (Sampurna & Romawati, 2020). Based on this premise, the researcher seeks to evaluate the extent to which firm value significantly impacts financial stability, using firm value as a mediating variable. The proxy for firm value is as follows.

Firm Value = Tobin's Q.

The hypothesis is as follows.

H_{5a}: Firm value mediates the positive relationship between profitability and financial stability.

H_{5b}: Firm value mediates the positive leverage on financial stability.

H_{5c}: Firm value mediates positively liquidity to financial stability.

2.9. Firm Age as Control Variable

According to Ilaboya and Ohiokha (2016), firm age is calculated from the year of establishment. Firm age plays a significant role in business. Shumway (2001) argues that a firm's age since listing is more relevant than its incorporation age, as firms differ in size and purpose. Research by Rahman and Yilun (2021) and Samosir (2018) indicates a positive connection between firm age and profitability, with older firms attracting more investors and achieving greater financial stability. Merry (2013) also notes that experienced management in older firms contributes to higher profitability. To measure firm age, this research uses the natural logarithm of the listing date. Al Nawaiseh (2020) emphasizes that the well-established companies will utilize their accumulated resources,

experience, and reputation to counter challenges effectively, thereby providing operational efficiencies and social responsibility. The influence of firm age on financial stability will be examined. Firm age serves as a control variable, and it is determined by the number of years since listing on the Indonesian Stock Exchange. The proxy is as follows.

Firm Age (FA) = The age of a firm, calculated based on the years since its listing on the Stock Exchange.

2.10. Interest Rate as Control Variable

Interest rates are crucial for financial stability, as their fluctuations can lead to both stability and instability (Gros, 2018). Morgan and Zhang (2018) note that financial stability significantly influences mortgage lending decisions. In the real estate industry, rising interest rates, especially for mortgages, might influence buyers' decisions to purchase property, leading to low demand and revenue, which ultimately creates financial instability. Given that some consumers are particularly sensitive to interest rate changes, this research will assess the influence of interest rates on financial stability. In this study, the mortgage interest rate serves as a control variable. The proxy is as follows:

Interest Rate= The mortgage interest rate provided by the bank.

2.11. COVID-19 as Dummy Variable

The COVID-19 pandemic brought on substantial uncertainty across the globe, leading to a global economic decline characterized by supply chain disruptions, reduced consumer spending, and lower investments. The World Health Organization reported around 583 million people who were inflicted and over 6 million deaths. Many employees shifted to remote work, and numerous organizations faced production halts, threatening their viability. However, some businesses adapted and thrived. The influence of COVID-19 on financial stability will be explored. COVID-19 serves as a dummy variable defined as follows.

- 2012-2019 = 0.
- 2020-2022 = 1.

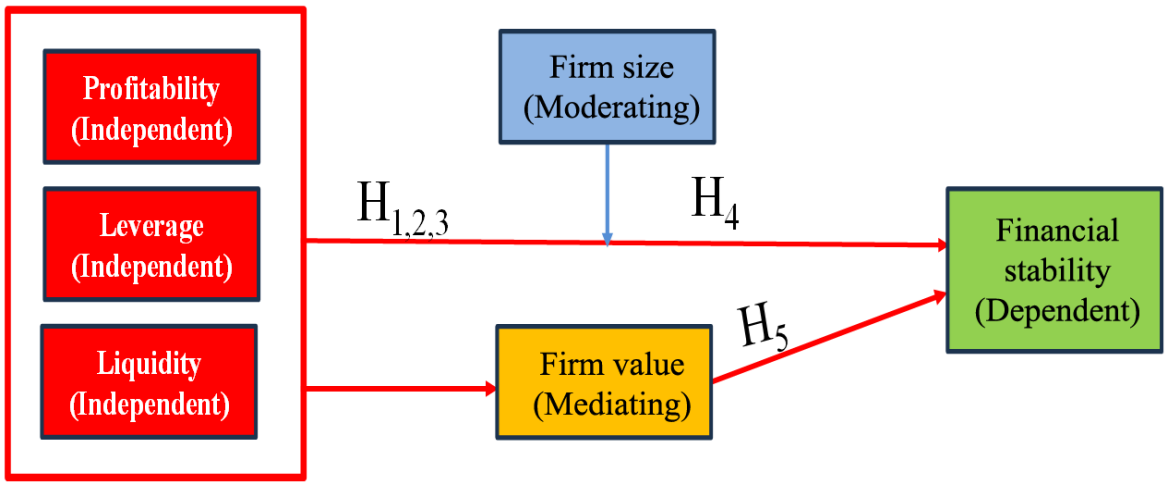


Figure 2. Research framework.

Figure 2 emphasizes that profitability, leverage, and liquidity directly influence financial stability, as outlined in hypotheses 1, 2, and 3. Additionally, firm size acts as a moderating variable, affecting the relationship between profitability, leverage, liquidity, and financial stability, which is addressed in hypothesis 4. Furthermore, firm value serves as a mediating variable, linking profitability, leverage, and liquidity to financial stability, as detailed in hypothesis 5.

3. METHODOLOGY

3.1. Data Analysis Technique and Sample

Multiple linear regression analysis has been employed to examine the impact of the independent variables on the dependent variables. Panel data is used for this research and consists of time-series data and cross-sectional data (Ghozali, 2017). Winarno (2009) elucidates that time-series data involves observing a single subject across multiple time periods, while cross-sectional data involves observing multiple subjects at a single point in time. By merging these two types, panel data provides a robust dataset for analysis. This research utilizes EViews software for statistical analysis and examines 83 publicly listed real estate companies on the Indonesian Stock Exchange from 2012 to 2022. This study includes 83 samples, as the total number of real estate companies in 2022 was 83.

3.2. Research Model

The connection between the independent variable and the dependent variables is depicted in the research model. A quantitative research approach has been used. Sugiyono (2013) explains that this research employs statistical methods to analyze numerical data. The model is as follows.

3.2.1. Model 1

The Model 1 is as follows.

$$FSTA_{it} = \alpha_0 + \alpha_1 PRFT_{it} + \alpha_2 LEVG_{it} + \alpha_3 LIQD_{it} + \alpha_4 FAGE_{it} + \alpha_5 INTR_{it} + \alpha_6 FVAL_{it} + \alpha_7 FSIZ_{it} + \alpha_8 COVD_{it} + \varepsilon_{it}$$

α_0 = Intercept.

α_1 - α_8 = The Regression Coefficient.

Model 1 is employed for testing the following hypothesis.

H_1: Profitability positively affects financial stability.

H_2: Leverage negatively affects financial stability.

H_3: Liquidity positively affects financial stability.

3.2.2. Model 2

The equation of Model 2 is as follows.

$$FSTA_{it} = \beta_0 + \beta_1 PRFT_{it} + \beta_2 LEVG_{it} + \beta_3 LIQD_{it} + \beta_4 FSIZ_{it} + \beta_5 PRFT * FSIZ_{it} + \beta_6 LEVG * FSIZ_{it} + \beta_7 LIQD * FSIZ_{it} + \beta_8 FAGE_{it} + \beta_9 INTR_{it} + \beta_{10} FVAL_{it} + \beta_{11} COVD_{it} + \varepsilon_{it}$$

β0 = Intercept.

β1-β11 = The Regression Coefficient.

After testing hypotheses 1, 2, and 3, Model 2 will be used to test hypothesis 4.

Model 2 is employed for testing the following hypothesis.

H_{4a}: Firm size moderates positively profitability and financial stability.

H_{4b}: Firm size moderates positively leverage and financial stability.

H_{4c}: Firm size moderates positively liquidity and financial stability.

3.2.3. Model 3 – Two-Stage Least Square

The hypotheses are as follows.

H_{5a}: Firm value mediates positively profitability to financial stability.

H_{5b}: Firm value mediates positively leverage to financial stability.

H_{5c}: Firm value mediates positively liquidity to financial stability.

3.2.3.1. Model 3 – Step 1

The equation of Model 3 – Step 1 is as follows.

$$FVAL_{it} = \gamma_0 + \gamma_1 PRFT_{it} + \gamma_2 LEVG_{it} + \gamma_3 LIQD_{it} + \gamma_4 FAGE_{it} + \gamma_5 INTR_{it} + \gamma_6 FSIZ_{it} + \gamma_7 COVD_{it} + \varepsilon_{it}$$

γ0 = Intercept.

γ1- γ11 =The Regression Coefficient.

3.2.3.2. Model 3 - Step 2

The equation of Model 3 – Step 2 is as follows.

$$FSTA_{it} = \delta_0 + \delta_1 FVAL_{it} + \delta_2 FAGE_{it} + \delta_3 INTR_{it} + \delta_4 FSIZ_{it} + \delta_5 COVD_{it} + \varepsilon_{it}$$

δ0 = Intercept.

δ1 - δ5 = The regression coefficient.

The abbreviations for dependent and independent variables are as follows.

FSTA= Financial Stability.

PRFT= Profitability.

LEVG = Leverage.

LIQD = Liquidity.

FAGE=Firm age.

INTR= Interest rate.

FVAL=Firm value.

FISZ=Firm size.

COVD=COVID-19, serves as a dummy variable, with zero (0) for the years from 2012 to 2019, and one (1) for the years from 2020 to 2022.

i= The company.

t= The year.

ε= The error term.

4. RESEARCH RESULTS AND DISCUSSION

4.1. Selection of Regression Model and Classical Assumption Test

This research selects the regression model through three major tests: the Chow test, the Hausman test, and the Lagrange Multiplier test. Based on the results of these tests, the Random Effect Model (REM) was chosen. For the classical assumption tests, the data was normally distributed according to the normality test. Additionally, the model showed no signs of multicollinearity or heteroscedasticity.

4.1.1. Model 1

Table 1 shows that the probability value (p-value) (F-statistic) 0.0000, which is below the significance level of 0.05. Given the F-statistic value, it is concluded that all independent variables (Profitability (PRFT), Leverage (LEVG), Liquidity (LIQD), Firm Age (FAGE), Interest Rate (INTR), Firm Value (FVAL), Firm Size (FISZ), and COVID-19 (COVD)) jointly have a significant impact on the dependent variable, Financial Stability (FSTA), in Model 1.

The R-squared value is 0.8070, or 80.70%, indicating that the independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and COVD) explain 80.70% of the variation in FSTA. The remaining 19.30% is explained by other factors not included in this study. LEVG, LIQD, FAGE, INTR, FVAL, and FISZ have p-values of 0.0000, 0.0000, 0.0005, 0.0000, 0.0072, and 0.0000, respectively, all below the 5% significance level. This indicates that each of these variables significantly affects FSTA. Conversely, the p-values for PRFT and COVD are 0.4071

and 0.4013, respectively, which exceed the 5% significance level. This suggests that both PRFT and COVD do not have a significant influence on FSTA.

The results of the hypothesis are as follows.

H_1 is rejected as P value > 0.05.

H_2 is accepted as P value < 0.05 and t value < 0.

H_3 is accepted as P value < 0.05 and t value > 0.

Table 1. Result of model 1.

Variable	Coefficient	Std. error	t-statistic	Prob.
PRFT	-0.0235	0.0283	-0.8293	0.4071
LEVG	-0.1341	0.0143	-9.4086	0.0000
LIQD	0.1079	0.0170	6.3567	0.0000
FAGE	-0.0646	0.0184	-3.5170	0.0005
INTR	0.1221	0.0288	4.2360	0.0000
FVAL	-0.0387	0.0144	-2.6914	0.0072
FISZ	1.0678	0.0241	44.3528	0.0000
COVD	-0.0111	0.0132	-0.8397	0.4013
C	0.0724	0.0158	4.5976	0.0000
R-squared	0.8070	Mean dependent var		0.0879
Adjusted R-squared	0.8053	S.D. dependent var		0.2817
S.E. of regression	0.1243	Sum squared resid		13.9665
F-statistic	472.6233	Durbin-Watson stat		1.5826
Prob(F-statistic)	0.0000			

4.1.2. Model 2

As explained in Table 2, the p-value is 0.0000, which is below 0.05. It is concluded that all independent variables, control variables, the mediating variable, and the moderating variable (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and COVD) jointly have a significant influence on FSTA in Model 2.

The R-squared value is 0.8157, or 81.57%, indicating that the independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and COVD) collectively explain 81.57% of the variance in FSTA. The remaining 18.43% is explained by other factors outside this study.

The independent variables PRFT, LEVG, LIQD, FAGE, FVAL, and FISZ have p-values of 0.0474, 0.0000, 0.0000, 0.0013, and 0.0000, respectively, all of which are below 0.05. This indicates that these variables significantly impact the dependent variable, FSTA.

In contrast, INTR and COVD, with p-values of 0.1424 and 0.1325, respectively, exceed the 0.05 threshold, suggesting they do not significantly influence FSTA. Additionally, the p-value for the interaction term PRFT*FISZ is 0.0000, which is below the 0.05 significance threshold, indicating that FISZ moderates the relationship between PRFT and FSTA. However, the interaction terms LEVG*FISZ and LIQD*FISZ have p-values of 0.1866 and 0.5833, respectively, both above 0.05, suggesting that FISZ does not moderate the relationships between LEVG, LIQD, and FSTA.

Results of hypothesis are as follows.

H_{4a} is accepted as P value < 0.05 and t value > 0.

H_{4b} is rejected as P value > 0.05.

H_{4c} is rejected as P value > 0.05.

Table 2. Result of model 2.

Variable	Coefficient	Std. error	t-statistic	Prob.
PRFT	0.0617	0.0311	1.9852	0.0474
LEVG	-0.1289	0.0141	-9.1178	0.0000
LIQD	0.1092	0.0173	6.3273	0.0000
FAGE	-0.0586	0.0182	-3.2268	0.0013
INTR	0.0452	0.0308	1.4682	0.1424
FVAL	-0.0473	0.0142	-3.3339	0.0009
FISZ	1.0550	0.0238	44.3912	0.0000
COVD	-0.0195	0.0130	-1.5056	0.1325
PRFT*FISZ	0.0675	0.0109	6.1845	0.0000
LEVG*FISZ	0.0000	0.0000	-1.3217	0.1866
LIQD*FISZ	0.0000	0.0000	-0.5488	0.5833
C	0.0525	0.0162	3.2464	0.0012
R-squared	0.8157	Mean dependent var		0.0849
Adjusted R-squared	0.8134	S.D. dependent var		0.2812
S.E. of regression	0.1215	Sum squared resid		13.2917
F-statistic	362.4075	Durbin-Watson stat		1.5337
Prob(F-statistic)	0.0000			

4.1.3. Model 3 – Step 1 and Step 2

This study uses the Sobel test in Model 3 to evaluate the indirect impact of an independent variable on a dependent variable through a mediating variable. This test calculates the standard error of the indirect effect and determines whether it significantly deviates from zero. The formula used incorporates the regression coefficients and standard errors from both pathways involved in the mediation.

- Independent variable to mediator.
- Mediator to dependent variable.

The formula is as follows.

$$Z = \frac{a.b}{\sqrt{b^2.sa^2 + a^2.sb^2}}$$

Table 3. Result of model 3.

Result of model 3 – Step 1				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
PRFT	0.0468	0.0647	0.7234	0.4696
LEVG	0.0744	0.0323	2.3041	0.0214
LIQD	0.0614	0.0361	1.6995	0.0896
FAGE	0.0842	0.0371	2.2710	0.0234
INTR	0.2463	0.0655	3.7623	0.0002
FISZ	0.1288	0.0536	2.4026	0.0165
COVD	0.1220	0.0302	4.0355	0.0001
C	-0.1960	0.0243	-8.0552	0.0000
R-squared	0.3055	Mean dependent var		-0.1961
Adjusted R-squared	0.3001	S.D. dependent var		0.3654
S.E. of regression	0.3057	Sum squared resid		84.5701
F-statistic	56.8618	Durbin-Watson stat		1.4468
Prob(F-statistic)	0.0000	Second-stage SSR		84.5701
Instrument rank	8			
Result of model 3 – Step 2				
Variable	Coefficient	Std. error	t-statistic	Prob.
FAGE	-0.0530	0.0193	-2.7511	0.0061
INTR	0.0210	0.0142	1.4819	0.1387
FVAL	-0.0411	0.0153	-2.6965	0.0071
FSIZ	1.1156	0.0223	50.0999	0.0000
COVD	-0.0141	0.0139	-1.0155	0.3101
C	0.0638	0.0151	4.2291	0.0000
R-squared	0.7802	Mean dependent var		0.0926
Adjusted R-squared	0.7790	S.D. dependent var		0.2826
S.E. of regression	0.1328	Sum squared resid		16.0043
F-statistic	644.0739	Durbin-Watson stat		1.3815
Prob(F-statistic)	0.0000	Second-stage SSR		16.0043
Instrument rank	6			

The Sobel Test results are as follows.

Table 4. The Sobel test results of model 3.

Independent variables	t-statistic	Probability value	Hypothesis	Conclusion
PRFT	-0.6986	0.4848	H5a. Firm value mediates the positive relationship between profitability and financial stability.	P value >0.05, rejected
LEVG	-1.7516	0.0798	H5b. Firm value mediates the positive relationship between leverage and financial stability.	P value >0.05, rejected
LIQD	-1.4375	0.1506	H5c. Firm value mediates positively between liquidity and financial stability.	P value >0.05, rejected

4.2. Robustness

Robustness checks were performed to ensure the model's stability and reliability. The robustness approach has two schemes.

1. Inclusion of a new variable: The Financial Service Index (FISI) was incorporated into the model to assess its impact.
2. Modification of Variables: The Financial Service Index (FISI) was still added as No. 1 above, but the COVID-19 (COVD) variable was removed to examine changes in its behavior under this alteration.

4.3. Inclusion of a New Variable

4.3.1. Model 1

Model 1 incorporates a new variable, FISI (Financial Stress Index). The equation of Model 1 is as follows.

$$FSTA_{it} = \alpha_0 + \alpha_1 PRFT_{it} + \alpha_2 LEVG_{it} + \alpha_3 LIQD_{it} + \alpha_4 FAGE_{it} + \alpha_5 INTR_{it} + \alpha_6 FVAL_{it} + \alpha_7 FSIZ_{it} + \alpha_8 FISI_{it} + \alpha_9 COVD_{it} + \varepsilon_{it}$$

As shown in Table 5, the p-value is 0.0000, which is below 0.05. It is concluded that all independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, FISI, and COVD) jointly have a significant influence on FSTA in Model 1.

Table 5 indicates an R-squared value of 0.7680, or 76.80%, which means that PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, FISI, and COVD explain 76.80% of FSTA. The remaining 23.20% is explained by other factors outside this study.

Table 5 reveals that the independent variables (LEVG, LIQD, FAGE, INTR, FVAL, and FISZ) have p-values of 0.0000, 0.0000, 0.0005, 0.0000, 0.0073, and 0.0000, respectively, all below 0.05. It is concluded that these independent variables have a significant influence on FSTA.

However, the p-value of PRFT, FISI, and COVD, respectively, stand at 0.4020, 0.7141, and 0.4216, which is above 0.05, indicating that they have no significant effect on FSTA.

The results of the hypothesis are as follows.

H_1 is rejected as P value > 0.05.

H_2 is accepted as P value < 0.05 and t value < 0.

H_3 is accepted as P value < 0.05 and t value > 0.

Table 5. Result of model 1.

Variable	Coefficient	Std. error	t-statistic	Prob.
PRFT	-0.0238	0.0284	-0.8385	0.4020
LEVG	-0.1340	0.0143	-9.4019	0.0000
LIQD	0.1078	0.0170	6.3470	0.0000
FAGE	-0.0646	0.0184	-3.5147	0.0005
INTR	0.1223	0.0288	4.2409	0.0000
FVAL	-0.0386	0.0144	-2.6877	0.0073
FISZ	1.0678	0.0241	44.3323	0.0000
FISI	0.0032	0.0087	0.3665	0.7141
COVD	-0.0106	0.0132	-0.8040	0.4216
C	0.0738	0.0162	4.5487	0.0000
R-squared	0.8071	Mean dependent var		0.0880
Adjusted R-squared	0.8051	S.D. dependent var		0.2817
S.E. of regression	0.1244	Sum squared resid		13.9657
F-statistic	419.7031	Durbin-Watson stat		1.5846
Prob(F-statistic)	0.0000			

4.3.2. Model 2

The equation of Model 2 is as follows.

$$FSTA_{it} = \beta_0 + \beta_1 PRFT_{it} + \beta_2 LEVG_{it} + \beta_3 LIQD_{it} + \beta_4 FAGE_{it} + \beta_5 INTR_{it} + \beta_6 FVAL_{it} + \beta_7 FSIZ_{it} + \beta_8 FISI_{it} + \beta_9 COVD_{it} + + \beta_{10} PRFT * FSIZ_{it} + \beta_{11} LEVG * FSIZ_{it} + \beta_{12} LIQD * FSIZ_{it} + \varepsilon_{it}$$

The data presented in Table 6 reveals that the p-value is 0.0000, which is lower than 0.05. This result shows that the independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, FISI, and COVD) collectively exert a significant influence on FSTA in Model 2. Table 7 shows R-squared value of 0.8158, or 81.58%, signifying that the independent variables account for 81.58% of the variance observed in FSTA. The remaining 18.42% of the variance is explained by other factors outside this research.

Additionally, the table indicates that PRFT, LEVG, LIQD, FAGE, FVAL, and FISZ have p-values of 0.0469, 0.0000, 0.0013, 0.0009, and 0.0000, respectively, all of which are below 0.05. It is concluded that these variables have a significant effect on FSTA. In contrast, the variables INTR, FISI, and COVD have p-values of 0.1441, 0.4322, and 0.1509, respectively, which exceed the 0.05 significance threshold, implying that they do not significantly impact FSTA. Moreover, the interaction term PRFT*FISZ shows a p-value of 0.0000, indicating that FISZ significantly moderates the relationship between PRFT and FSTA. However, the interaction terms LEVG*FISZ and LIQD*FISZ have p-values of 0.1883 and 0.5684, respectively, both above 0.05, suggesting that FISZ does not moderate the relationships between LEVG, LIQD, and FSTA.

Results of hypothesis are as follows.

H_{4a} is accepted as P value < 0.05 and t value > 0.

H_{4b} is rejected as P value > 0.05.

H_{4c} is rejected as P value > 0.05.

4.3.3. Model 3

The equation of Model 3 – Step 1 is as follows:

$$FVAL_{it} = \gamma_0 + \gamma_1 PRFT_{it} + \gamma_2 LEVG_{it} + \gamma_3 LIQD_{it} + \gamma_4 FAGE_{it} + \gamma_5 INTR_{it} + \gamma_6 FSIZ_{it} + \gamma_7 FISI_{it} + \gamma_8 COVD_{it} + \varepsilon_{it}$$

The equation of Model 3 – Step 2 is as follows.

$$FSTA_{it} = \delta_0 + \delta_1 FAGE_{it} + \delta_2 INTR_{it} + \delta_3 FVAL_{it} + \delta_4 FSIZ_{it} + \delta_5 FISI_{it} + \delta_6 COVD_{it} + \varepsilon_{it}$$

Table 6. Result of model 2.

Variable	Coefficient	Std. error	t-statistic	Prob.
PRFT	0.0618	0.0311	1.9903	0.0469
LEVG	-0.1288	0.0141	-9.1118	0.0000
LIQD	0.1091	0.0173	6.3192	0.0000
FAGE	-0.0585	0.0182	-3.2221	0.0013
INTR	0.0451	0.0308	1.4620	0.1441
FVAL	-0.0473	0.0142	-3.3336	0.0009
FISZ	1.0550	0.0238	44.3803	0.0000
FISI	0.0067	0.0086	0.7857	0.4322
COVD	-0.0187	0.0130	-1.4376	0.1509
PRFT*FISZ	0.0681	0.0109	6.2220	0.0000
LEVG*FISZ	0.0000	0.0000	-1.3167	0.1883
LIQD*FISZ	0.0000	0.0000	-0.5706	0.5684
C	0.0553	0.0166	3.3393	0.0009
R-squared	0.8158	Mean dependent var		0.0849
Adjusted R-squared	0.8133	S.D. dependent var		0.2812
S.E. of regression	0.1215	Sum squared resid		13.2831
F-statistic	332.1106	Durbin-Watson stat		1.5368
Prob(F-statistic)	0.0000			

Table 7. Result of model 3.

Model 3 – Step 1				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
PRFT	0.0472	0.0647	0.7296	0.4658
LEVG	0.0744	0.0323	2.3035	0.0215
LIQD	0.0615	0.0361	1.7026	0.0890
FAGE	0.0840	0.0371	2.2658	0.0237
INTR	0.2459	0.0655	3.7533	0.0002
FISZ	0.1287	0.0536	2.3995	0.0166
FISI	-0.0049	0.0204	-0.2414	0.8093
COVD	0.1214	0.0304	3.9968	0.0001
C	-0.1982	0.0260	-7.6229	0.0000
R-squared	0.3055	Mean dependent var		-0.1962
Adjusted R-squared	0.2993	S.D. dependent var		0.3654
S.E. of regression	0.3059	Sum squared resid		84.5790
F-statistic	49.6985	Durbin-Watson stat		1.4465
Prob(F-statistic)	0.0000	Second-stage SSR		84.5790
Instrument rank	9.0000			
Model 3 – Step 2				
Variable	Coefficient	Std. error	t-statistic	Prob.
FAGE	-0.0530	0.0193	-2.7506	0.0061
INTR	0.0210	0.0142	1.4814	0.1388
FVAL	-0.0411	0.0153	-2.6930	0.0072
FISZ	1.1156	0.0223	50.0748	0.0000
FISI	0.0038	0.0093	0.4052	0.6854
COVD	-0.0136	0.0140	-0.9773	0.3287
C	0.0655	0.0157	4.1837	0.0000
R-squared	0.7803	Mean dependent var		0.0927
Adjusted R-squared	0.7788	S.D. dependent var		0.2826
S.E. of regression	0.1329	Sum squared resid		16.0029
F-statistic	536.2380	Durbin-Watson stat		1.3845
Prob(F-statistic)	0.0000	Second-stage SSR		16.0029
Instrument rank	7.0000			

The Sobel Test results are as follows.

Table 8. The Sobel test results of model 3 – robustness for inclusion of a new variable.

Independent Variables	t-Statistic	Probability Value	Hypothesis	Conclusion
PRFT	-0.7042	0.4813	H5a. Firm value mediates the positive relationship between profitability and financial stability.	P value >0.05, rejected
LEVG	-1.7505	0.0800	H5b. Firm value mediates the positive relationship between leverage and financial stability.	P value >0.05, rejected
LIQD	-1.4391	0.1501	H5c. Firm value mediates the positive relationship between liquidity and financial stability.	P value >0.05, rejected

4.4. Modification of Variables

4.4.1. Model 1

In Model 1, a new variable, FISI (Financial Stress Index), is introduced, while COVD is excluded from the equation. The equation for Model 1 is as follows.

$$FSTA_{it} = \alpha_0 + \alpha_1 PRFT_{it} + \alpha_2 LEVG_{it} + \alpha_3 LIQD_{it} + \alpha_4 FAGE_{it} + \alpha_5 INTR_{it} + \alpha_6 FVAL_{it} + \alpha_7 FSIZ_{it} + \alpha_8 FISI_{it} + \varepsilon_{it}$$

As shown in Table 9, the p-value is 0.0000, which is below 0.05. It is concluded that all independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and FISI) collectively have a significant influence on FSTA, in Model 1. Table 9 reveals an R-Squared value of 0.8069, or 80.69%, indicating that PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and FISI collectively explain 80.69% of the variation in FSTA. The remaining 19.31% is explained by other factors outside this study.

Table 10 shows that the p-value of LEVG, LIQD, FAGE, INTR, FVAL, and FISZ, respectively, stand at 0.0000, 0.0000, 0.0003, 0.0053, and 0.0000, which are below 0.05. This indicates that these independent variables have a significant influence on FSTA. Conversely, PRFT and FISI, with p-values of 0.3409 and 0.6608, respectively, exceed 0.05, suggesting that they do not significantly affect FSTA.

The results of the hypothesis are as follows.

H_1 is rejected as P value > 0.05.

H_2 is accepted as P value < 0.05 and t value < 0.

H_3 is accepted as P value < 0.05 and t value > 0.

Table 9. Result of model 1.

Variable	Coefficient	Std. error	t-statistic	Prob.
PRFT	-0.0268	0.0281	-0.9529	0.3409
LEVG	-0.1343	0.0142	-9.4221	0.0000
LIQD	0.1071	0.0170	6.3145	0.0000
FAGE	-0.0664	0.0182	-3.6445	0.0003
INTR	0.1208	0.0288	4.1973	0.0000
FVAL	-0.0399	0.0143	-2.7953	0.0053
FISZ	1.0679	0.0241	44.3509	0.0000
FISI	0.0038	0.0087	0.4389	0.6608
C	0.0753	0.0161	4.6700	0.0000
R-squared	0.8069	Mean dependent var		0.0880
Adjusted R-squared	0.8052	S.D. dependent var		0.2817
S.E. of regression	0.1243	Sum squared resid		13.9752
F-statistic	472.2789	Durbin-Watson stat		1.5858
Prob(F-statistic)	0.0000			

4.4.2. Model 2

The equation of Model 2 is as follows.

$$FSTA_{it} = \beta_0 + \beta_1 PRFT_{it} + \beta_2 LEVG_{it} + \beta_3 LIQD_{it} + \beta_4 FAGE_{it} + \beta_5 INTR_{it} + \beta_6 FVAL_{it} + \beta_7 FSIZ_{it} + \beta_8 FISI_{it} + \beta_9 PRFT * FSIZ_{it} + \beta_{10} LEVG * FSIZ_{it} + \beta_{11} LIQD * FSIZ_{it} + \varepsilon_{it}$$

As indicated in Table 9, the p-value is 0.0000, which is below 0.05. Given this p-value, it is concluded that all the independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and FISI) collectively have an impact on the dependent variable (FSTA) in Model 2. Table 9 indicates that R-squared value is 0.8153, or 81.53%, meaning that the independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and FISI) account for 81.53% of the variation in FSTA. The remaining 18.47% is explained by other factors outside this research. Table 9 reveals that the independent variables (LEVG, LIQD, FAGE, FVAL, and FISZ) have p-values of 0.0000, 0.0000, 0.0006, 0.0005, and 0.0000, respectively, all below 0.05. This indicates that these variables have a significant influence on FSTA. In contrast, PRFT, INTR, and FISI, with probability values of 0.0754, 0.1529, and 0.3666, respectively, exceed the 5% significance threshold, suggesting they do not significantly affect FSTA. Furthermore, the interaction term PRFT*FISZ has a p-value of 0.0000, which is below 0.05, concluding that FISZ moderates the connection between PRFT and FSTA. However, the p-values for LEVG*FISZ and LIQD*FISZ are 0.1913 and 0.5926, respectively, both above 0.05, suggesting that FISZ does not moderate the relationships between LEVG, LIQD, and FSTA.

The results of the hypothesis are as follows.

H_{1a} is accepted as P value < 0.05 and t value > 0

H_{1b} is rejected as P value > 0.05

H_{1c} is rejected as P value > 0.05

Table 10. Result of model 2.

Variable	Coefficient	Std. error	t-statistic	Prob.
PRFT	0.0546	0.0307	1.7800	0.0754
LEVG	-0.1293	0.0141	-9.1417	0.0000
LIQD	0.1076	0.0172	6.2436	0.0000
FAGE	-0.0618	0.0180	-3.4358	0.0006
INTR	0.0441	0.0308	1.4306	0.1529
FVAL	-0.0494	0.0141	-3.4927	0.0005
FISZ	1.0554	0.0238	44.3897	0.0000
FISI	0.0077	0.0085	0.9033	0.3666
PRFT*FISZ	0.0665	0.0109	6.1062	0.0000
LEVG*FISZ	0.0000	0.0000	-1.3077	0.1913
LIQD*FISZ	0.0000	0.0000	-0.5353	0.5926
C	0.0583	0.0164	3.5493	0.0004
R-squared	0.8153	Mean dependent var		0.0851
Adjusted R-squared	0.8131	S.D. dependent var		0.2812
S.E. of regression	0.1216	Sum squared resid		13.3187
F-statistic	361.6174	Durbin-Watson stat		1.5387
Prob(F-statistic)	0.0000			

4.4.3. Model 3

The equation of Model 3 – Step 1 is as follows.

$$FVAL_{it} = \gamma_0 + \gamma_1 PRFT_{it} + \gamma_2 LEVG_{it} + \gamma_3 LIQD_{it} + \gamma_4 FAGE_{it} + \gamma_5 INTR_{it} + \gamma_6 FSIZ_{it} + \gamma_7 FISI_{it} + \varepsilon_{it}$$

The equation of Model 3 – Step 2 is as follows.

$$FSTA_{it} = \delta_0 + \delta_1 FAGE_{it} + \delta_2 INTR_{it} + \delta_3 FVAL_{it} + \delta_4 FSIZ_{it} + \delta_5 FISI_{it} + \varepsilon_{it}$$

Table 11. Result of model 3.

Result of Model 3 – Step 1				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
PRFT	0.0838	0.0644	1.3024	0.1931
LEVG	0.0777	0.0325	2.3927	0.0169
LIQD	0.0706	0.0362	1.9474	0.0518
FAGE	0.1034	0.0370	2.7921	0.0053
INTR	0.2677	0.0656	4.0820	0.0000
FISZ	0.1313	0.0539	2.4370	0.0150
FISI	-0.0122	0.0205	-0.5945	0.5523
C	-0.2179	0.0257	-8.4744	0.0000
R-squared	0.2947	Mean dependent var		-0.1954
Adjusted R-squared	0.2893	S.D. dependent var		0.3653
S.E. of regression	0.3079	Sum squared resid		85.8225
F-statistic	54.0282	Durbin-Watson stat		1.4523
Prob(F-statistic)	0.0000	Second-Stage SSR		85.8225
Instrument rank	8.0000			
Result of Model 3 – Step 2				
Variable	Coefficient	Std. error	t-statistic	Prob.
FAGE	-0.0556	0.0190	-2.9164	0.0036
INTR	0.0154	0.0130	1.1861	0.2359
FVAL	-0.0429	0.0151	-2.8346	0.0047
FISZ	1.1149	0.0223	50.0885	0.0000
FISI	0.0045	0.0093	0.4897	0.6245
C	0.0673	0.0155	4.3415	0.0000
R-squared	0.7800	Mean dependent var		0.0930
Adjusted R-squared	0.7788	S.D. dependent var		0.2827
S.E. of regression	0.1329	Sum squared resid		16.0302
F-statistic	643.1465	Durbin-Watson stat		1.3845
Prob(F-statistic)	0.0000	Second-Stage SSR		16.0302
Instrument rank	6.0000			

The Sobel Test results are as follows.

Table 12. The Sobel test results of model 3 – robustness for modification of the variable.

Independent variables	t-statistic	Probability value	Hypothesis	Conclusion
PRFT	-1.1834	0.2366	H5a. Firm value mediates the positive relationship between profitability and financial stability.	P value >0.05, rejected
LEVG	-1.8283	0.0674	H5b. Firm value mediates the positive relationship between leverage and financial stability.	P value >0.05, rejected
LIQD	-1.6051	0.1084	H5c. Firm value mediates positively between liquidity and financial stability.	P value >0.05, rejected

5. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations are as follows:

F-statistic Test: The results for the original models of Model 1 and Model 2 are the same. This indicates that all independent variables (PRFT, LEVG, LIQD, FAGE, INTR, FVAL, FISZ, and COVD) collectively influence FSTA.

5.1. Individual Significance Test

- In Model 1, the individual significance test (t-test or partial test) showed that LEVG, LIQD, FAGE, INTR, FVAL, and FISZ significantly affect FSTA, while PRFT and COVD do not.

- In Model 2, PRFT, LEVG, LIQD, FAGE, FVAL, and FISZ have a significant impact on FSTA, whereas INTR and COVD do not.

Model 3 (Two-Stage Least Squares): In the original version of Model 3, the results indicate that FVAL does not mediate the effects of PRFT, LEVG, and LIQD on FSTA, respectively.

5.2. Summary from Model 1, 2, and 3

- *H_1 is rejected.*
- *H_2 and H_3 are accepted.*
- *H_{4a} is accepted, while H_{4b} and H_{4c} are rejected.*
- *H_{5a}, H_{5b}, and H_{5c} are rejected.*

Robustness Test: The robustness test confirms that the model remains robust despite adjustments through two schemes. In the first scheme, the model incorporates the new variable FISI, and in the second scheme, FISI is added, and COVD is excluded. Both schemes yield the same conclusions.

- *H_1 is rejected.*
- *H_2 and H_3 are accepted.*
- *H_{4a} is accepted, while H_{4b} and H_{4c} are rejected.*
- *H_{5a}, H_{5b}, and H_{5c} are rejected.*

The robustness test results demonstrate that the conclusions for all hypotheses remain consistent with the original model, confirming the model's robustness under varying conditions. As this research is limited to the real estate sector, its findings and recommendations may not be generalizable to other industries. Future research should consider including additional industries to evaluate the factors influencing financial stability across a broader range of sectors. Furthermore, this study examined F eight variables, in addition to the dependent variable, to assess the relationships between the dependent variable and the independent variables, control variables, mediating variable, moderating variable, and dummy variable. Future research should incorporate more variables to provide a more comprehensive understanding of the determinants of financial stability.

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