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The Effect of Financial Literacy on Firm Performance

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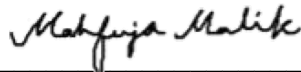
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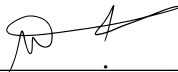
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ABSTRACT

This study examines the influence of financial literacy on firm performance by integrating state-level financial literacy data with firm-level metrics including Market Capitalization, Tobin's Q, ROA, ROE, and EBIT. Utilizing data from the National Financial Capability Study (NFCS) and COMPUSTAT for the years 2009 to 2024, and a sample size of 100,126 observations, it highlights how higher levels of financial literacy correlate with improved firm valuation and profitability. The study employs the Financial Literacy Index and its imputed counterpart using the Fully Conditional Specification (FCS) method to address missing data. Regression analyses reveal that financial literacy significantly impacts both valuation and profitability measurements, though the results vary across metrics. For valuation measurements, higher levels of financial literacy are negatively associated with Market Capitalization, demonstrating financially literate environments reduce overvaluation and speculative pricing, aligning firm valuations more closely with intrinsic fundamentals. Similarly, financial literacy positively influences Tobin's Q, suggesting that firms in regions with higher financial literacy levels are more efficient in utilizing their assets relative to market expectations. The impact on Tobin's Q is mixed, with mostly negative results but some positive estimates in specific models, indicating that financial literacy moderates speculative pricing but may also improve valuation recognition for firms with strong fundamentals. For profitability measurements, financial literacy is positively associated with ROA, demonstrating that firms in financially literate regions optimize asset utilization and enhance operational efficiency. The impact on EBIT is mixed, showing that while financial literacy can contribute to improved profitability, its effect varies based on industry dynamics and external market factors. The relationship with ROE is statistically insignificant across most models, suggesting that shareholder returns may be influenced by additional factors such as corporate governance, leverage decisions, and financing structures rather than financial literacy alone. These findings highlight the dual role of financial literacy in reducing speculative valuations and enhancing operational efficiency. However, its effects vary across firm performance metrics, suggesting context-dependent influences shaped by industry, macroeconomic conditions, and governance factors. The use of imputation methods strengthens data integrity, ensuring a rigorous assessment of financial literacy's impact. Future research should explore sector-specific variations and long-term trends to better understand its evolving role in corporate financial decision-making.

JEL Classification: G30, G40, M14, D14, D24

Keywords: Financial Literacy, Corporate Performance, Firm Valuation, Profitability Metrics, Market Efficiency, Imputation Methods, Financial Capability.

The Effect of Financial Literacy on Firm Metrics

I. Introduction

This paper investigates the influence of financial literacy on firm performance by integrating state-level financial literacy data with comprehensive firm-level performance metrics. Using a unique dataset that amalgamates the National Financial Capability Study (NFCS) and COMPUSTAT, this research investigates the effect of state-level financial literacy on firm valuation and profitability metrics. Those components are Market Capitalization, Tobin's Q, Return on Asset (ROA), Return on Equity (ROE), and Earnings Before Interest and Taxes (EBIT), measured through both direct and imputed indicators. Although the relationship between individual financial literacy and personal financial outcomes has been well-documented (Lusardi & Mitchell, 2011; Van Rooij, Lusardi, & Alessie, 2011), limited attention has been given to its implications at the corporate level. The study makes three primary contributions: (1) It identifies the mechanisms through which financial literacy influences firms' operational efficiency, market valuation, and profitability; (2) It employs advanced imputation methods to address data gaps, ensuring robust statistical outcomes; and (3) It bridges the gap in the literature by extending the discussion on financial literacy from the individual to the corporate level.

This paper extends the conversation on financial literacy impact from the individual to the corporate level and demonstrates how higher levels of financial literacy at the state level are associated with metrics like Market Capitalization and operational indicators like *EBIT* by explicitly using the Financial Literacy Index (*Fin_Lit*) and its imputed counterpart (*I_Fin_Lit*). This study matches firm data to the state of their headquarters to accurately map financial literacy at the state level to firm performance metrics. This methodological step ensures that the state-level

Fin_Lit is correctly aligned with the firm's operational and financial activities, providing a more precise analysis of the relationship between financial literacy and firm performance.

Building on prior research (Lusardi & Mitchell, 2008; Baker & Wurgler, 2007), this paper demonstrates that higher levels of state-level financial literacy are positively associated with improved firm performance across these metrics, which emphasize the importance of financial literacy in effective planning and its potential to reshape long-term financial behaviors. The transition from individual financial behaviors to corporate-level outcomes reflects the aggregation of regional financial decision-making. Higher levels of financial literacy among individuals contribute to more disciplined financial decision-making, reducing impulsive or speculative investment behaviors while fostering a more stable and predictable market environment. Financially literate individuals are better equipped to assess risks, manage investments prudently, and make long-term financial decisions, which in turn leads to more sustainable firm valuations and reduced market volatility. At the firm level, these improvements manifest through better investor confidence, improved access to capital, and stronger governance practices, ultimately contributing to enhanced firm valuation and operational efficiency.

The impact of financial literacy on firm performance is expected to vary across both valuation and profitability metrics. On the positive side, higher financial literacy facilitates efficient resource allocation, supports informed investment decisions, and strengthens corporate governance, leading to improvements in Market Capitalization, Tobin's Q, *ROA*, *ROE*, and *EBIT*. Specifically, increased financial literacy fosters greater investor confidence, which enhances Market Capitalization by driving higher demand for firms with sound financial fundamentals. Additionally, firms in financially literate regions tend to be more efficient in asset utilization,

contributing to a higher Tobin's Q, as market participants better recognize firms' intrinsic value relative to their assets.

From a profitability perspective, financial literacy plays a crucial role in operational efficiency. A financially literate environment promotes prudent decision-making among executives and investors, leading to stronger *EBIT* through improved revenue generation and cost management. Similarly, *ROA* is expected to increase as firms optimize their asset utilization to generate higher returns. *ROE*, which reflects how well a firm is using shareholder equity to drive profits, is also likely to be positively influenced; however, its sensitivity to leverage decisions may introduce variability in outcomes.

Despite these positive effects, there are potential negative impacts associated with high financial literacy. Overconfidence in financially literate regions may encourage excessive risk-taking, leading to aggressive investment strategies that could elevate Tobin's Q without a corresponding increase in intrinsic firm value. Likewise, firms with high financial literacy may engage in more complex financial structuring, which could introduce volatility in *ROE* due to fluctuations in leverage and shareholder returns. This dual perspective ensures a balanced analysis of financial literacy's role in corporate performance, acknowledging both its benefits in fostering efficiency and stability, as well as its potential drawbacks in contributing to riskier financial behaviors.

The regression results reveal that the impact of financial literacy on firm valuation and profitability varies across different metrics. Market Capitalization consistently exhibits a negative and significant relationship with financial literacy across all fixed effect specifications. The coefficients range from -0.336 to -0.285, statistically significant at the 1% level. These results suggest that higher financial literacy at the state level is associated with lower market

capitalization, possibly due to reduced speculative trading and more conservative investor behavior. Tobin's Q presents a more nuanced pattern, as it is mostly negative but has some positive estimates. The coefficients are significantly negative in most cases (ranging from -2.591 to -1.786) but also show some positive values in specific specifications. This suggests that financial literacy moderates firm valuation, possibly reducing over-optimistic pricing, but in some contexts, it may support firms being recognized for their intrinsic value.

ROA is mostly positive across specifications, indicating that firms in financially literate environments tend to optimize asset utilization and improve operational efficiency. The coefficients range from 0.185 to 0.486, with statistical significance at the 1% level. However, a few cases show a negative *ROA* relationship, suggesting that while financial literacy generally enhances operational efficiency, industry-specific factors or firm characteristics may mediate this effect. *ROE* exhibits mixed results, with both negative and positive coefficients depending on the fixed effect model used with insignificant relationship. The coefficients range from -0.090 to 0.282, suggesting that while financial literacy may help firms improve efficiency, its influence on shareholder returns is not consistent. This may be due to differences in capital structures, leverage effects, or firm-specific governance policies. *EBIT* presents a mixed pattern, with some specifications showing a positive impact (e.g., 0.407) while others report negative or insignificant effects (e.g., -0.012). These findings indicate that financial literacy enhances operational performance in some settings, but external market conditions, cost structures, and firm strategies could influence *EBIT* variability.

Overall, these findings suggest that while financial literacy plays a crucial role in enhancing firm profitability (especially through *ROA* and *EBIT*), its effect on firm valuation (*Market Cap* and Tobin's Q) might be more nuanced, potentially reflecting adjustments in investor behavior and

market expectations. Additionally, the imputation method strengthens the analysis by preserving the integrity of financial literacy measures, ensuring robust and reliable results.

Moreover, this study addresses potential limitations in the existing literature by employing robust statistical methods, explicitly the Fully Conditional Specification (FCS), to maneuver missing data in financial literacy measures. The FCS method, as outlined by Buuren (2018), uses a flexible and iterative approach that enhances the predictive accuracy of imputed data by incorporating information from multivariate datasets. By imputing missing values, the analysis ensures that variations in financial literacy are accurately captured while preserving the integrity of their relationships with firm-level metrics. This methodological rigorous approach not only strengthens the reliability of the findings but also establishes a replicable framework for future research exploring the juncture of financial literacy and corporate performance.

The implications of these findings make a significant contribution to understanding the intricate role financial literacy plays in shaping firm valuation and profitability metrics. By leveraging both observed and imputed financial literacy measures, the study highlights the corrective influence of financial literacy on speculative behaviors, leading to more accurate market valuations. As shown in Lusardi and Mitchell (2017) and Van Rooij, Lusardi, and Alessie (2011), higher financial literacy levels among individuals contribute to more efficient financial decision-making and reduce speculative behaviors. These individual-level effects, when aggregated, may foster more stable and disciplined market environments. Building on this literature, these results suggest that firms operating in regions with higher financial literacy levels benefit from improved investor confidence, better resource allocation, and stronger corporate governance practices.

These insights extend the existing literature by making a novel contribution to financial literacy and corporate performance literature by mending the gap between macro-level educational

initiatives and micro-level corporate outcomes. By addressing these dynamics, this paper provides critical insights for policymakers, corporate strategists, and educators aiming to leverage financial literacy as a tool for economic and corporate development. This extension complements earlier findings by scholars such as Bernheim and Garrett (2003), who emphasize the societal value of financial knowledge. It accentuates the importance of investing in financial education not only for individual financial well-being but also as a strategic lever to enhance firm competitiveness and long-term value creation.

Beyond financial metrics, firms operating in regions with higher financial literacy levels may feel an increased obligation to prioritize corporate social responsibility (CSR) to align with the expectations of well-informed stakeholders. Financially literate employees and investors are more likely to demand ethical business practices, transparent financial reporting, and sustainability initiatives. As a result, firms may invest more in CSR programs, such as employee well-being initiatives, environmental sustainability, and community development, which in turn can enhance their reputation and long-term profitability.

Furthermore, financial literacy can significantly impact employee productivity, engagement, and loyalty, leading to improved firm performance. Employees in financially literate environments tend to be more financially secure, reducing workplace stress and increasing job satisfaction. This heightened engagement translates into greater efficiency and commitment to organizational goals, positively influencing *EBIT* through improved operational outcomes. Additionally, *ROE* benefits as loyal and motivated employees drive innovation and customer satisfaction, leading to sustained revenue growth. When employees feel a stronger connection to their firms, turnover rates decrease, reducing recruitment and training costs while fostering

institutional knowledge. These factors contribute to a more stable and high-performing workforce, reinforcing the positive relationship between financial literacy and corporate success.

II. Literature Review and Hypothesis Development

The relationship between financial literacy and corporate performance has become an increasingly important area of research. Researchers are continuously examining the implications of financial literacy on decision-making, operational efficiency, and value creation (Lusardi & Mitchell, 2011; Bernheim & Garrett, 2003; Van Rooij, Lusardi, & Alessie, 2011). While much of the existing research focuses on individual financial literacy and its impact on household financial outcomes, less attention has been given to its influence at the firm level. This study contributes to the broader literature by addressing this gap, investigating how financial literacy affects firm valuation and profitability, and identifying the mechanisms through which financial knowledge translates into corporate financial performance.

For instance, Lusardi and Mitchell (2011) highlight the significant role of financial literacy in shaping financial outcomes, demonstrating how improved financial knowledge leads to better decision-making and financial planning, particularly in corporate settings. Similarly, Van Rooij, Lusardi, and Alessie (2011) provide evidence of the positive relationship between financial literacy and market participation, showcasing how informed decision-making among investors can enhance corporate performance through efficient capital allocation. Al-Matari, Al-Swidi, and Fadzil (2014) further elaborate on the critical role of valuation and profitability metrics such as Market Capitalization, *ROA*, and *ROE* in evaluating firm performance, underscoring the impact of informed financial decision-making on these dimensions.

Financial literacy also plays a key role in debt management and financial stability. Lusardi and Tufano (2015) examine debt literacy and financial experiences, revealing that individuals with

lower levels of debt literacy tend to engage in high-cost borrowing, accumulate excessive debt, and face financial distress. These findings suggest that financial literacy not only influences household financial behavior but also has broader implications for corporate financial stability and decision-making. Firms that operate in financially literate environments may benefit from lower credit risk and improved access to financing, as financially knowledgeable managers are more likely to engage in prudent financial planning and risk mitigation strategies.

Financial Literacy and Individual Outcomes

As defined by Lusardi and Mitchell (2011), financial literacy involves the understanding and application of financial concepts such as risk management, inflation, and interest rates. Lusardi and Mitchell (2011) developed the Financial Literacy Index (FLI), which has become a fundamental assessment tool for evaluating individuals' financial knowledge and subsequent behavior, such as savings and retirement planning (Clark, Lusardi, and Mitchell, 2017). Various studies have shown that financially literate individuals make informed decisions, leading to higher savings rates, lower debt levels, and improved investment strategies (Bernheim & Garrett, 2003; Lusardi & Mitchell, 2011). However, while these studies highlight individual benefits, the implications for corporate decision-making remain underexplored, representing a critical gap in the literature. This study directly examines how financial literacy affects firm performance, addressing the gap in the literature.

Extension to Workplace and Firm-Level Dynamics

Moving beyond individual impacts, employer-led financial literacy programs have demonstrated the potential to enhance workforce engagement and, ultimately, productivity. Employees often face financial challenges such as budgeting and debt management, which can negatively impact their job performance. Research by Joo and Garman (1998) found that

workplace financial education programs address these challenges, leading to improved financial well-being, reduced turnover, and increased job satisfaction. Employees who are financially literate experience lower financial stress, which translates into higher workplace engagement, better focus on tasks, and improved overall productivity. Financially secure employees are more likely to remain with their current employer, reducing turnover costs associated with hiring and training new staff. Additionally, greater job satisfaction fosters a sense of loyalty and commitment to the organization, which in turn strengthens team cohesion and promotes a more positive work environment. These factors collectively enhance firm performance by improving operational efficiency, boosting *EBIT* through more effective resource utilization, and ultimately contributing to a more stable and high-performing workforce.

Supporting this perspective, Bernheim, Garrett, and Maki (2001) found that employer-sponsored financial education programs not only improve employees' financial behaviors but also contribute to increased productivity and job retention. Their study highlights how financial literacy fosters a more engaged workforce, leading to measurable improvements in organizational performance overall. Similarly, Bernheim, Bayer, and Scholz (2009) reinforce this view, emphasizing that financial education initiatives improve participation in retirement plans and contribute to long-term financial stability.

Beyond individual employees, the effect of financial literacy at the corporate level extends to overall firm performance. Employees in financially literate environments are more likely to make sound financial decisions, which can enhance firm profitability through greater operational efficiency. Higher employee engagement translates into increased *EBIT*, as firms benefit from improved resource management and productivity. Additionally, firms operating in financially literate regions may feel a heightened obligation to uphold corporate social responsibility (CSR)

standards, aligning with investor and employee expectations. This, in turn, fosters greater loyalty and retention, reducing hiring and training costs while bolstering firm competitiveness.

Bridging the Gap

While the literature predominantly explores the benefits of financial literacy at the individual level, this study extends its implications to firm-level financial performance. As individuals make better financial decisions, firms benefit from improved corporate-level outcomes driven by regional financial behaviors. Higher levels of financial literacy among individuals promote sound financial practices, reduce speculative behaviors, and enhance market stability. At the firm level, these improvements manifest through better investor confidence, improved access to capital, and stronger governance practices, ultimately contributing to enhanced firm valuation and operational efficiency.

While Market Capitalization is negatively associated with financial literacy, Tobin's Q exhibits mixed results, sometimes showing positive estimates. This distinction is crucial—while financial literacy may reduce speculative overvaluation, it also ensures that firms with strong fundamentals receive appropriate valuation recognition. In other words, financial literacy moderates excessive optimism in firm pricing while reinforcing long-term value creation. This distinction highlights financial literacy's dual role: discouraging irrational market speculation while strengthening firms with sound financial health.

Furthermore, firms that operate in regions with financially literate populations are more likely to attract investors who make informed and rational investment decisions, thereby reducing market volatility and promoting more accurate firm valuations (Baker & Wurgler, 2007). Higher levels of financial literacy among corporate executives also facilitate more effective capital budgeting decisions, ensuring optimal resource allocation for long-term value creation (Al-Matari

et al., 2014). This study also draws on behavioral finance research, such as DeBondt and Thaler (1985), which examines the tendency for markets to overreact to new information. Their findings suggest that financial literacy plays a key role in mitigating overreaction by fostering more rational investment decisions and reducing market inefficiencies. Investors and managers who possess higher financial literacy levels are less likely to succumb to cognitive biases, leading to more stable and accurate firm valuations.

By incorporating these insights, this study bridges the gap in the literature by demonstrating how financial literacy not only benefits individuals but also plays a crucial role in firm valuation, governance, and profitability. Understanding these dynamics provides a foundation for developing more effective corporate policies and financial education programs aimed at enhancing firm-level outcomes.

Methodological Innovations in Measuring Financial Literacy

This study integrates financial literacy data from the National Financial Capability Study (NFCS) with firm-level financial data from COMPUSTAT to examine the impact of financial literacy on corporate performance. The FINRA Investor Education Foundation conducts the NFCS every three years to assess financial literacy across U.S. states through a standardized survey. The NFCS measures individuals' knowledge of key financial concepts such as inflation, interest rates, and risk diversification. The Financial Literacy Index (*Fin_Lit*) is constructed based on responses to these survey questions, representing the average financial literacy score for each state in a given survey year. However, due to variations in survey participation, missing data is a recurring challenge.

To address this, this study employs the Fully Conditional Specification (FCS) method, a robust multiple imputation technique developed by Rubin (1987) and extended in practice by

Buuren (2018). FCS imputes missing financial literacy values using an iterative regression-based framework that preserves internal variable relationships. Additionally, the challenges of handling missing firm-level financial data have been extensively addressed by Hubbard, Himmelberg, and Palia (1999, pp. 360–365), who emphasize the importance of robust imputation for maintaining consistency in corporate finance analyses. This method imputes missing financial literacy values, ensuring a more complete and reliable dataset.

This study evaluates various imputation options, including Mean Imputation, Regression Imputation and Predictive Mean Matching. Mean Imputation, which is a quick fix where missing values are replaced by the mean. While this is a simple and fast approach, it often underestimates variance and biases estimates other than the mean. Applying Mean Imputation for *Fin_Lit* as an option, but it might distort relationships in the dataset. Another option considered was Regression Imputation. This method uses regression models to predict missing values based on other variables. In our dataset, we could model for *Fin_Lit* using available financial metrics and impute missing values using this approach. Regression Imputation preserves the relationships between variables. Alternate option was the Stochastic Regression Imputation. An extension of Regression Imputation, this method adds random noise to predictions, preserving the correlation between variables and introducing variability that makes the imputed values more realistic. Next is the Predictive Mean Matching. This is a flexible method that fills in missing values by identifying observed cases with similar predicted values. This approach can be useful when *Fin_Lit* values are semi-continuous or exhibit non-normality, as it matches actual observed values. Then there is the Monotone Data Imputation. This method is ideal if the missing data pattern is monotone (when missingness occurs in a specific order). This allow for the use of sequential univariate imputation methods to fill in missing values. The last method considered is the Last Observation Carried

Forward (LOCF): This is an imputation method commonly used in longitudinal datasets. It carries forward the last known value for missing subsequent observations. However, it may introduce bias and isn't suitable if *Fin_Lit* shows high variability over time.

Given that *Fin_Lit* has a large portion of missing data, and there are other related financial metrics available (like *Market_Cap*, *ROA*, *Leverage*, etc.), the most robust approach would be Fully Conditional Specification (FCS). FCS is a variation of Stochastic Regression Imputation. Stochastic Regression Imputation involves predicting missing values using regression models and adding random noise to preserve variability. FCS extends this idea by performing regression-like imputations iteratively for each variable with missing data, modeling each variable conditional on the others. FCS imputes each missing value based on a regression model, but it does so iteratively and can handle non-monotone missing data patterns, which are common in complex datasets. This flexibility is important because missing data in *Fin_Lit* does not follow a predictable or monotone pattern across the dataset. FCS preserves the relationships between *Fin_Lit* and other financial variables such as *Market_Cap*, *ROA*, and *Leverage*. Each variable with missing data is modeled as a function of the other variables in the dataset, ensuring that the imputed values make sense within the context of the other financial indicators. This is critical because *Fin_Lit* is likely influenced by these other metrics, and imputing values based on these relationships will yield more realistic results. FCS imputes missing values iteratively, meaning that it uses the relationships between all variables to impute missing data one at a time, updating the imputed values in each step. This approach refines the imputation at each stage, leading to more accurate results. This iterative process ensures that no variable is imputed in isolation, which is particularly useful when a large portion of data is missing. Similar to Stochastic Regression Imputation, FCS incorporates variability into the imputation process. This means that the imputed values are not deterministic

but rather reflect the uncertainty inherent in the missing data, helping to maintain the variability of the dataset. For example, since the standard deviation of *Fin_Lit* is around 0.226 and its imputation variable *I_Fin_Lit* is 0.226, it is important to maintain this level of variability in the imputed values to avoid over-smoothing the data.

It is important to understand the limitations of the other imputations methods and why there were not chosen for this research. Mean Imputation method would oversimplify the imputation process by replacing missing values with the mean of the observed data. While this is quick and easy, it would significantly reduce the variability in the dataset, leading to biased results and a loss of valuable information about the relationships between variables. Simple Regression Imputation would maintain relationships between *Fin_Lit* and other financial variables, it would not capture the inherent variability in *Fin_Lit*. The imputed values would be overly smooth and too predictable, potentially distorting the dataset. FCS addresses this by incorporating variability into the imputed values, making the imputation more robust.

As outlined by Buuren (2018), this study addresses an important methodological gap through the employment of FCS for imputing missing financial literacy data. Traditional imputations, such as mean substitution, often fail to grasp the subtle relationships within datasets. On the other hand, FCS iteratively incorporates the diverse composition of the dataset to improve the robustness and accuracy of the analysis. Previous research has validated the effectiveness of FCS in preserving statistical relationships while handling missing data (e.g., Rubin, 1987; Schafer, 1997). Although FCS is more widely used in fields like epidemiology and social sciences, its application in finance remains relatively limited. However, financial researchers can leverage its flexibility to address missing data in complex financial models. While specific studies applying FCS directly in finance are scarce, the methodology's flexibility makes it a valuable tool for

financial researchers dealing with incomplete data (Berglund, 2015). By implementing this method, this study ensures that financial literacy levels are estimated in a way that maintains the integrity of their correlation with firm valuation and profitability metrics. This approach sets a precedent for future research by strengthening empirical findings on financial literacy's impact on corporate outcomes, especially where observed financial literacy data are absent.

Though there are significant advancements in financial literacy literature, some gaps remain in understanding how financial literacy influences specific industries and macroeconomic conditions. The existing literature largely focuses on individual financial literacy outcomes, leaving an underexplored area concerning its impact at the corporate level. Prior literature stresses the multi-layered role of financial literacy by bridging individual behavior and corporate metrics to provide a holistic comprehension of economic implications. By analyzing the methodical and conceptual gaps, this study contributes to a growing body of knowledge that provides practical means for policymakers, educators, and corporate leaders to make strategic decisions.

This study broadens the literature by empirically linking financial literacy to firm performance metrics such as Market Capitalization, Tobin's Q, *ROA*, *ROE*, and *EBIT*. This approach provides novelty in its demonstration that higher financial literacy at the state level associates with improved firm valuation and operational outcomes for the firms located in that states orienting with the broader themes of economic and corporate development discussed in earlier works (Fama & French, 1992; Lang & Stulz, 1994).

Hypothesis

Financial literacy can play a critical role in shaping firm valuation and operational efficiency, as this study examines the validity of such a claim. Prior research demonstrates the importance of financial knowledge in improving economic decision-making and reducing

speculative behavior (Lusardi & Mitchell, 2011; Van Rooij, Lusardi, & Alessie, 2011; Hastings, Madrian, & Skimmyhorn, 2013). Building on this foundation, this study extends the application of financial literacy from individual and household outcomes to corporate performance metrics. The rationale is that higher levels of financial literacy among corporate executives, investors, and employees enhance informed decision-making, leading to better management of firm resources, improved financial strategies, and optimization of corporate investment decisions. Higher financial literacy levels in a population promote stable market valuations by reducing speculative behaviors and fostering well-informed investment decisions. Financially literate stakeholders—both employees and investors—engage in more prudent financial behaviors, strengthening corporate governance and enhancing market confidence. As a result, firms benefit from improved capital access, efficient asset allocation, and long-term financial sustainability. These effects translate into higher Market Capitalization and Tobin's Q, as investor sentiment stabilizes around firms with strong financial foundations. Similarly, financial literacy contributes to profitability improvements, as measured by *ROA*, *ROE*, and *EBIT*, by fostering a work environment where employees make informed financial choices that enhance productivity and organizational stability. Beyond direct financial metrics, financial literacy influences firm performance through employee engagement and corporate social responsibility (CSR). Employees who possess financial knowledge experience reduced financial stress, leading to increased job satisfaction, higher productivity, and lower turnover rates. Firms operating in financially literate regions may also feel a heightened obligation to uphold CSR standards, aligning their governance and ethical practices with investor and employee expectations. These interactions create a positive feedback loop—enhanced financial knowledge improves workforce stability, which in turn strengthens firm valuation and profitability metrics.

The primary hypothesis is driven by the notion that financially literate populations reduce speculative behaviors and promote efficient market valuations. Market efficacy is critical for stable valuation, and financial literacy can behave as a primary corrective mechanism to reign in firm valuation with intrinsic metrics, as shown by Fama and French (1992). In this context, Fama and French (1992) provide a foundational framework for understanding firm valuation by identifying key determinants such as size and book-to-market ratio in explaining stock returns. Their asset pricing model emphasizes that firm-specific fundamentals—not investor sentiment or speculation—should drive valuations. This principle aligns with the premise that financial literacy contributes to valuation efficiency by fostering better-informed investor behavior and corporate decision-making. Financial literacy, by reducing behavioral biases and information asymmetries, enables both managers and investors to evaluate firms based on intrinsic value rather than speculative trends. Therefore, the application of Fama and French’s framework is used here to argue that financial literacy reinforces valuation models that are anchored in fundamental indicators, rather than driven by market noise or short-term hype. While financial literacy contributes to more stable valuations by reducing market inefficiencies and speculative trading, stability does not inherently translate to increased firm value. Instead, financial literacy helps align firm valuation with intrinsic metrics, reinforcing the principles outlined by Fama and French (1992), fostering more predictable and sustainable financial performance rather than artificial short-term gains. While Fama and French (1992) do not study financial literacy directly, their framework highlights the role of firm fundamentals—such as size and book-to-market—in driving valuations. Financial literacy indirectly supports this model by fostering investor behavior and corporate governance practices that emphasize fundamentals over speculative signals, thereby reducing mispricing and valuation anomalies.

Furthermore, drawing from insights by Lusardi and Mitchell (2011), financially literate stakeholders, either employees or investors, are more likely to engage in more prudent financial behaviors. Employees with higher financial literacy tend to make better personal financial decisions, reducing financial stress, which enhances workplace productivity and job performance. A financially secure workforce leads to lower turnover rates, increased employee engagement, and higher overall efficiency, which collectively strengthen a firm's operational capacity.

Similarly, investors with greater financial knowledge make more informed investment choices, supporting firms that exhibit strong fundamentals rather than speculative growth, thus fostering long-term stability and sustainable valuation. This ultimately leads to the contribution of the firm's profitability and operational efficacy by aligning coherent financial behavior with risk management and operational excellence. Enhanced financial literacy leads to better risk management, as firms in financially literate regions or with financially knowledgeable executives are more likely to make data-driven investment decisions, optimize capital allocation, and avoid excessive leverage. Additionally, firms operating in financially literate environments are more likely to implement structured budgeting strategies, cost-efficient operations, and strategic long-term planning, all of which enhance *EBIT* and *ROA*. Ultimately, aligning coherent financial behavior with robust risk management and operational excellence ensures that firms maximize profitability while maintaining financial stability and resilience in fluctuating markets.

Taken together, these mechanisms highlight the multi-faceted role of financial literacy in shaping firm outcomes. Financial literacy enhances corporate governance by improving investor confidence and reducing information asymmetry. It strengthens capital allocation by guiding firms toward sustainable investment strategies, mitigating speculative pricing distortions. At the operational level, financially literate workforces contribute to firm profitability through enhanced

productivity, reduced turnover, and cost efficiency. These factors collectively support firm valuation and profitability, justifying the following hypothesis.

***H1:** Financial literacy positively influences firm valuation metrics (e.g., Market Capitalization, Tobin's Q) and profitability metrics (e.g., ROA, ROE, EBIT).*

III. Research design

Data and sample selection

This study examines the impact of state-level financial literacy on firm performance using data from the National Financial Capability Study (NFCS) and COMPUSTAT for the sample period from 2009 to 2024. The Financial Industry Regulatory Authority (FINRA) Investor Education Foundation undertook a survey collection to measure the financial capabilities of the United States population. This provided the ability to set a benchmark level by which Financial Literacy is to be measured and provided a large sample overview of the population, consisting of adults over 18 years old which stretched across all 50 states, plus the District of Columbia (DC). Financial literacy data are aggregated at the state level and imputed where necessary to account for missing data using FCS techniques. The dataset includes firm-specific performance metrics such as Market Capitalization and Tobin's Q, as well as profitability such as Return on Asset, Return on Equity, and Earnings Before Interest and Taxes from COMPUSTAT. The final dataset comprises 100,126 observations, matched across financial literacy scores and firm-level performance metrics—valuation and profitability measurement. The sample spans various industries, as classified by two-digit Standard Industrial Classification (SIC) codes, ensuring a broad representation of the U.S. economic landscape.

A critical component of this study involves matching firm-level financial performance metrics to the financial literacy levels of the state where the firm's headquarters is located. This

approach ensures that the financial literacy environment surrounding a firm's primary decision-makers—its executives and investors—can be appropriately linked to corporate financial outcomes. Prior research has utilized similar geographical-based matching methodologies to assess how regional financial literacy affects economic outcomes (e.g., Campbell, 2006; Hastings, Madrian, and Skimmyhorn, 2013). This method assumes that firms headquartered in states with higher financial literacy levels will exhibit more prudent financial decision-making, improved corporate governance, and enhanced operational efficiency.

Missing Data Imputation

A significant challenge in utilizing financial literacy data from the NFCS is the presence of missing values due to variations in state survey participation across different years. The *Fin_Lit* dataset spans the years 2009, 2012, 2015, 2018, and 2021, creating gaps where financial literacy scores are missing for specific states and years. Missing data can significantly affect the robustness and accuracy of the analysis, necessitating an imputation technique to ensure completeness. To address this, this study employs the FCS imputation technique, a robust statistical method widely used for handling missing data in multivariate analyses (Rubin, 1987; Schafer, 1997; Buuren, 2018). FCS is an advanced variation of stochastic regression imputation design to handle non-monotone missing data patterns where missing values do not occur in a strict order. Unlike simpler methods like mean or single regression imputation, FCS introduces variability into the imputed values, preserving the natural distribution of *Fin_Lit* and maintaining relationships with other financial metrics such as *Market_Cap*, *ROA*, and *Leverage*. FCS updates imputed values in multiple iterations, progressively improving the accuracy of the imputation process because it ensures that no variable is imputed in isolation. Thus, enhancing the overall quality of the dataset. In addition, FCS adds random noise into the imputed value, Imputed Financial Literacy Index

(*I_Fin_Lit*), to avoid over-smoothing the data and maintaining the natural variability of *Fin_Lit*. This ensures that the imputed values reflect the true distribution of the observed data. Other methods, such as Mean Imputation, would replace missing *Fin_Lit* values and significantly reduce variability, leading to biased results and masking the relationships between variables. While Simple Regression Imputation would maintain the relationship between *Fin_Lit* and other variables, it would produce predestined imputations that fail to capture the inherent uncertainty in the missing data.

Dependent variables

The dependent variables of this study are firm performance metrics. Five measures are used to analyze firm performance with two variables focusing on firms market performance, and three focusing on operative performance. The first market performance measure is Market Capitalization (*Market_Cap*) as the natural logarithm of market capitalization and the second measurement is Tobin's Q (*Tobin_Q*) as the sum of market value and total long-term debt divided by total assets. The three profitability metrics are Return on Assets (*ROA*), calculated as Income Before Extraordinary Items divided by Total Assets; Return on Equity (*ROE*) calculated as Income Before Extraordinary Items divided by Total Equity; and Earnings Before Interest and Taxes (*EBIT*) calculated as log-transformed Earnings Before Interest and Taxes (only for positive *EBIT* values).

These variables capture critical aspects of firm valuation, profitability, and operational efficiency, which are directly influenced by financial literacy at the state level. *Market_Cap* reflects the valuation in financial markets and research shows that it is sensitive to investor knowledge and behavior (Baker & Wurgler, 2007; Fama & French, 1992). This makes *Market_Cap* an ideal proxy for how external market forces, influenced by financial literacy, impact

firms (Baker & Wurgler, 2007; Fama & French, 1992). Prior research suggest that financial literacy moderates market speculation and stabilizes investor sentiment, leading to more sustainable valuations trends (Van Rooij, Lusardi, & Alessie, 2011). *ROA* offers insight into how efficiently management uses assets to generate earnings and studies point out that *ROA* is a robust indicator of operational performance (Al-Matari et al., 2014), principally concerning external macroeconomic factors such as state-level financial literacy (Al-Matari et al., 2014). *ROE* reflects the efficiency of equity utilization and is often used in research to provide an assessment of firm success and is linked to external financial market dynamics (Al-Matari et al., 2014). Their study, (Al-Matari et al., 2014), on corporate governance and firm performance found that *ROA* and *ROE* are the two most commonly used accounting-based measures in research. *EBIT* allows for operational profitability before financing and tax considerations, making it an ideal indicator of a firm's core performance. *EBIT* is incredibly useful for isolating the influence of financial literacy from broader financial or tax policy effects (Nissim & Penman, 2001). *Tobin_Q* offers insights into market expectations and firm efficiency where it captures intangible factors like reputation and renovation that could be influenced by a financially literate population (Lang & Stulz, 1994; Chung & Pruitt, 1994).

These metrics capture multiple dimensions of firm performance and are widely used in financial and economic research, ensuring that the methodology aligns with established academic practices (Lang & Stulz, 1994; Baker & Wurgler, 2007). They are shaped by external market and macroeconomic factors, particularly financial literacy at the state level. Prior studies have examined the influence of state-level factors on firm performance, highlighting the role of institutional frameworks, government policies, and socio-political factors in shaping corporate decision-making. For example, Dou, Hope, and Thomas (2013) demonstrate that differences in

state-level contract enforceability influence firms' financial reporting choices, particularly income smoothing, as a way to manage stakeholder relationships. Ahmed and Ahsan (2023) provide a comprehensive review showing that state-level regulations in accounting, finance, and governance significantly affect corporate investment efficiency and reporting outcomes. Similarly, Garmaise and Moskowitz (2004) find that variation in regional property assessment quality and legal structures leads to information asymmetries, which in turn affect financing decisions and asset valuations, illustrating the substantial impact of localized institutional environments on firm-level behavior.. Firms operating in regions with higher financial literacy levels may benefit from more stable labor costs due to better financial decision-making at both the individual and corporate levels.

Recent research has further demonstrated the importance of state-level policies and taxation on firm behavior and resource allocation. For instance, Hyman, Freedman, Khanna, and Neumark (2023) examine how firm location and tax incentives shape corporate decision-making, using employer identification and geographic tracking to analyze economic activity. Their findings suggest that firms strategically adjust operations based on state-level economic incentives, emphasizing the broader role of financial literacy in corporate financial planning. Similarly, Giroud and Rauh (2019) analyze how state taxation policies affect firm decisions on location and business reallocation. Their research underscores that state-level financial and regulatory environments play a critical role in firm efficiency and profitability, reinforcing the notion that financial literacy may amplify these effects by enabling better strategic planning. Additionally, Butcher, Civril, and Kerr (2024) investigate how state-paid leave laws influence firm-level employment decisions, demonstrating that firms respond dynamically to changes in state policies, which can impact workforce management and financial performance.

These findings suggest that state-level financial literacy, taxation policies, and regulatory conditions collectively shape firm valuation, operational efficiency, and long-term profitability. Firms that operate in financially literate regions may experience improved investment decisions, enhanced governance, and stronger financial sustainability, ultimately influencing market valuation and profitability metrics. Given the potential influence of these external factors, this study applies winsorization at the 1% and 99% levels to minimize the impact of extreme outliers, ensuring the validity of the analysis.

Independent variable

Financial Literacy at the state level is the key explanatory variable. Provided by NFCS, the survey data helps capture the financial knowledge of the population. The financial knowledge questions provided by Clark, Lusardi & Mitchell (2015) with their correct answers in bold:

- **Interest Rate:** Suppose you had \$100 in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow? **More than \$110**, Exactly \$110, Less than \$110, DK, RF
- **Inflation:** Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account? More than today, Exactly the same, **Less than today**, DK, RF
- **Risk:** Is this statement True or False? Buying a single company's stock usually provides a safer return than a stock mutual fund. True, **False**, DK, RF

The first question measures people's ability to do a simple interest rate calculation; the second tests people's understanding of inflation; and the third is a joint test of knowledge about "stocks" (P. 4)

These questions allow for evaluations of respondents' ability to perform basic calculations and understand the implications of compound interest, how inflation affects purchasing power and savings, and how to spread investment to reduce risk. These responses are scored and aggregated to provide an average financial literacy score, Financial Literacy Index (*Fin_Lit*) for each state,

representing the general financial knowledge of its population. *Fin_Lit* serves as a proxy for the financial knowledge and capability of individuals within each state and reflects their ability to understand and apply financial concepts such as risk diversion, inflation, and interest rate comprehension. Studies have used financial literacy indices, including *Fin_Lit*, in empirical research to examine the impact of financial literacy on economic decision-making and financial behaviors (Lusardi and Mitchell, 2011; Van Rooij, Lusardi, and Alessie, 2011; Hastings, Madrian, and Skimmyhorn, 2013).

Measures of Financial Literacy Index (Fin_Lit) and Imputed Financial Literacy Index (I_Fin_Lit)

The measurement methodology developed by Lusardi & Mitchell (2011) has become the standard for evaluating financial literacy. This approach aligns with prior studies linking financial literacy to improved economic outcomes, such as enhanced retirement savings, investment behaviors, and better financial decision-making (Lusardi et al., 2017; Bernheim & Garrett, 2003). The consistent methodology across iterations of NFCS further reinforces its reliability as a measure of financial competence, making it a critical tool for analyzing state-level impacts on firm performance.

Each correct response to the financial literacy questions contributes one point to the respondent's financial literacy score. Responses marked as incorrect, "Don't Know" (DK), or "Refused" (RF) receive zero points. The total score for an individual respondent is the sum of correct answers across all financial literacy questions, with equal weight assigned to each question. This straightforward scoring system ensures that financial literacy is measured based on factual knowledge, minimizing subjective biases in evaluation.

While this scoring method provides a robust framework for assessing financial knowledge, some limitations must be acknowledged. The correct/incorrect format does not account for partial understanding or the nuances in respondents' financial knowledge. The weight assigned to each question is equal, which may not fully reflect the varying importance of different financial literacy components. Averaging individual scores might mask within-state disparities, such as differences between urban and rural populations.

Despite its limitations, the *Fin_Lit* methodology offers a transparent and widely accepted measure of financial literacy. Its scoring system captures critical financial knowledge, making it a reliable indicator for evaluating how financial literacy impacts firm performance. By addressing data gaps through FCS-based imputation, the *Fin_Lit* and *I_Fin_Lit* variables provide robust tools for exploring the intersection of financial literacy and economic outcomes at the state level.

Control variable

To isolate the impact of financial literacy, this study incorporates a range of control variables sourced from COMPUSTAT. Firm-specific controls include Firm Size (*Firm_Size*) as a log of total assets. Leverage (*Leverage*) is the total liabilities divided by total assets. Cash Holdings (*Cash_Holding*) is the cash divided by total assets. Book-to-Market Ratio (*Book_to_Market*) is calculated as total equity divided by market value. Stock Returns (*Stock_Return*) is the log-transformed, and Sales Growth (*Stales_Growth*) is the log-transformed total revenue. The choice of control variables and regression specifications is consistent with prior empirical studies, notably those by Lusardi and Mitchell (2014), van Rooij, Lusardi, and Alessie (2011), and Fernandes, Lynch, and Netemeyer (2014). These variables capture essential aspects of a firm's financial health and operational efficiency.

Regression model

Market Performance Models – To analyze the impact of financial literacy on firm market valuations, the following models focus on market performance indicators:

Equation 1: Market Capitalization Model

$$\begin{aligned} \widehat{Market_Cap}_{i,t} = & \hat{\alpha} + \widehat{\beta}_1 \widehat{Fin_Lit}_{i,t} + \widehat{\beta}_2 \widehat{Fim_Size}_{i,t} + \widehat{\beta}_3 \widehat{Leverage}_{i,t} + \widehat{\beta}_4 \widehat{Cash_Holding}_{i,t} \\ & + \widehat{\beta}_5 \widehat{Book_to_Market}_{i,t} + \widehat{\beta}_6 \widehat{Stock_Ret}_{i,t} + \widehat{\beta}_8 \widehat{Growth}_{i,t} + \sum_{t=1}^n Industry_Dummy \\ & + \sum_{t=1}^n Year_Dummy + u \end{aligned}$$

The dependent variable in this model is $\widehat{Market_Cap}_{i,t}$, measured as the natural log of market capitalization for firm i in year t . The key explanatory variable is $\widehat{Fin_Lit}_{i,t}$ representing the state-level Financial Literacy Index. $\widehat{Fin_Lit}_{i,t}$ is expected to positively impact market capitalization as higher financial literacy improves investment decisions, influencing market valuation.

Equation 2: Tobin's Q Model

$$\begin{aligned} \widehat{Tobin_Q}_{i,t} = & \hat{\alpha} + \widehat{\beta}_1 \widehat{Fin_Lit}_{i,t} + \widehat{\beta}_2 \widehat{Fim_Size}_{i,t} + \widehat{\beta}_3 \widehat{Leverage}_{i,t} + \widehat{\beta}_4 \widehat{Cash_Holding}_{i,t} + \widehat{\beta}_5 \widehat{Book_to_Market}_{i,t} \\ & + \widehat{\beta}_6 \widehat{Stock_Ret}_{i,t} + \widehat{\beta}_8 \widehat{Growth}_{i,t} + \sum_{t=1}^n Industry_Dummy + \sum_{t=1}^n Year_Dummy + u \end{aligned}$$

The dependent variable in this model is $\widehat{Tobin_Q}_{i,t}$, measured as the market value plus total long-term debt divided by total assets for firm i in year t . The key explanatory variable again continues to be $\widehat{Fin_Lit}_{i,t}$. $\widehat{Fin_Lit}_{i,t}$ is expected to positively impact $\widehat{Tobin_Q}$ as financial literacy impacts investor behavior and market valuation.

For the Market Performance models, $\widehat{Fim_Size}$ is expected to be positive ($\beta_2 > 0$) because larger firms generally have higher market capitalization due to their scale and resources. $\widehat{Leverage}$ is expected to be negative ($\beta_3 < 0$) because high leverage increases financial risk, potentially lowering market valuation. $\widehat{Cash_Holding}$ is expected to be positive ($\beta_4 > 0$) because higher

liquidity reflects better financial health, positively impacting valuation. *Stock_Ret* is expected to be positive ($\beta_6 > 0$) because strong stock performance drives higher market capitalization. *Growth* is expected to be positive ($\beta_7 > 0$) because firms with higher growth rates are valued more favorably by the market. However, *Book_to_Market* is expected to be negative ($\beta_5 < 0$) in these models, as lower book-to-market ratios typically indicate higher market valuation relative to book value.

Operating Performances Models – To examine how financial literacy affects firm profitability and operational efficiency, the following models focus on operating performance metrics:

Equation 3: Return on Assets (*ROA*) Model

$$\widehat{ROA}_{i,t} = \hat{\alpha} + \widehat{\beta}_1 \widehat{Fin_Lit}_{i,t} + \widehat{\beta}_2 \widehat{Fim_Size}_{i,t} + \widehat{\beta}_3 \widehat{Leverage}_{i,t} + \widehat{\beta}_4 \widehat{Cash_Holding}_{i,t} + \widehat{\beta}_5 \widehat{Book_to_Market}_{i,t} \\ + \widehat{\beta}_6 \widehat{Stock_Ret}_{i,t} + \widehat{\beta}_8 \widehat{Growth}_{i,t} + \sum_{t=1}^n \widehat{Industry_Dummy} + \sum_{t=1}^n \widehat{Year_Dummy} + u$$

The dependent variable in this model is $ROA_{i,t}$, measured calculated as income before extraordinary items divided by total assets for firm i in year t . The key explanatory variable remains to be $Fin_Lit_{i,t}$, and the expectation is for a positive relationship as financial literacy contributes to efficient allocation and use of resources, improving profitability.

Equation 4: Return on Equity (*ROE*) Model

$$\widehat{ROE}_{i,t} = \hat{\alpha} + \widehat{\beta}_1 \widehat{Fin_Lit}_{i,t} + \widehat{\beta}_2 \widehat{Fim_Size}_{i,t} + \widehat{\beta}_3 \widehat{Leverage}_{i,t} + \widehat{\beta}_4 \widehat{Cash_Holding}_{i,t} + \widehat{\beta}_5 \widehat{Book_to_Market}_{i,t} \\ + \widehat{\beta}_6 \widehat{Stock_Ret}_{i,t} + \widehat{\beta}_8 \widehat{Growth}_{i,t} + \sum_{t=1}^n \widehat{Industry_Dummy} + \sum_{t=1}^n \widehat{Year_Dummy} + u$$

The dependent variable in this model is $ROE_{i,t}$, measured as income before extraordinary items divided by total equity for firm i in year t . The key explanatory variable continues to be $Fin_Lit_{i,t}$ with the expectation to have a positive influence on *ROE* since improved financial understanding can enhance equity investment efficiency and firm returns.

Equation 5: Earnings Before Interest and Taxes (*EBIT*) Model

$$EBIT_{i,t} = \hat{\alpha} + \hat{\beta}_1 Fin_Lit_{i,t} + \hat{\beta}_2 Firm_Size_{i,t} + \hat{\beta}_3 Leverage_{i,t} + \hat{\beta}_4 Cash_Holding_{i,t} + \hat{\beta}_5 Book_to_Market_{i,t} \\ + \hat{\beta}_6 Stock_Ret_{i,t} + \hat{\beta}_7 Growth_{i,t} + \sum_{t=1}^n Industry_Dummy + \sum_{t=1}^n Year_Dummy + u$$

The dependent variable in this model is $EBIT_{i,t}$, measured by log of earnings before interest and taxes for firm i in year t . The key explanatory variable remains to be $Fin_Lit_{i,t}$ with the expectation to positively influence $EBIT$ by enhancing financial decision-making, leading to higher operational efficiency.

For the Operating Performance models $Firm_Size$ is expected to be positive ($\beta_2 > 0$) since larger firms benefit from economies of scale, improving asset utilization and profitability. $Leverage$ is expected to be negative ($\beta_3 < 0$) because high debt levels increase interest expenses, reducing profitability. $Cash_Holding$ is expected to be positive ($\beta_4 > 0$) as strong liquidity improves operational flexibility and financial stability. $Stock_Ret$ is expected to be positive ($\beta_6 > 0$) since higher stock returns signal more efficient asset use. $Growth$ is expected to be positive ($\beta_7 > 0$) as firms with higher growth rates are better positioned to generate returns. However, in contrast to the market performance models, $Book_to_Market$ is expected to be positive ($\beta_5 > 0$) here, as higher book-to-market ratios may indicate undervalued firms with greater potential for future profitability. Finally, there is the *Industry_Dummies* (acquirer's two-digit SIC code) and *Year_Dummies* are considered to control for other potential industry and time effects. Appendix A provides a summary of the variable definition.

IV. Empirical results

Sample distribution

Table 1 Panel A illustrates the industry-wide distribution of the sample, categorized by two-digit SIC codes. Manufacturing emerges as the dominant sector, comprising 34.53% of the

sample, followed by finance, insurance, and real estate, which accounts for 18.66%. The third-largest share is mining, contributing 15.61% of the sample. Additional representation comes from transportation, communication, and utilities at 6.98% and services at 14.86%, reflecting their moderate importance in the dataset. Other sectors constituting smaller portions of the sample are wholesale and retail trade for 6.63%, public administration accounts for 1.51%, and construction for 0.88%. Agriculture, forestry, and fisheries are at 0.35%, representing the lowest industry contribution.

This composition highlights the study's comprehensive approach, capturing key sectors with significant economic influence, such as manufacturing and finance, while also including a variety of smaller industries. The dominance of manufacturing and finance reflects their pivotal roles in the broader economy, while the inclusion of diverse sectors ensures a balanced perspective on the relationship between financial literacy and firm performance across multiple economic activities.

Table 1 Panel B presents the distribution of the sample across different years, spanning from 2009 to 2024. The dataset includes 100,141 observations, with yearly frequencies ranging between 6,060 and 7,214 from 2009 to 2023, except for 2024, which contains only 125 observations. The relatively consistent sample size across years suggests that the dataset maintains temporal stability, minimizing concerns about data imbalance over time. The highest number of observations occurs in 2014 (7,214 observations), while the lowest full-year sample appears in 2020 (6,060 observations). A gradual decline in observations is noted from 2016 onward, potentially reflecting firm exits, incomplete reporting, or reductions in data coverage. The substantial drop in 2024 (125 observations) suggests incomplete data collection for that year, which should be considered when interpreting results. This temporal distribution ensures that the

study captures long-term trends in financial literacy and firm performance, allowing for robust empirical analysis. However, researchers should account for the drop in sample size in recent years, particularly the incomplete data in 2024, to avoid potential biases.

Furthermore, the difference in total observations between Panel A (100,126 observations) and Panel B (100,141 observations) is likely due to missing or incomplete industry classifications for some firms. Thus, while Panel B captures the total number of year observations available in the dataset, Panel A only includes those firms for which a valid SIC industry classification exists. This minor discrepancy should not significantly impact the analysis but should be noted when interpreting results. Table 1 reports the Sample Distribution.

[Table 1]

Descriptive statistics

Table 2, Panel A provides a wide-ranging overview of the descriptive statistics for the variables used in the study. The dependent variables and explanatory variables have been winsorized at the 1st and 99th percentiles to mitigate the effects of extreme outliers. The dataset covers a sample spanning the years 2009 to 2024, drawing data from NFCS and COMPUSTAT. The sample size for the variables varies depending on the specific regression analysis.

The mean value for *Market_Cap*, measured as the natural log of market capitalization, is 5.411, signifying that, on average, the firms in the sample are moderately large. The profitability metrics, including *ROA* and *ROE*, disclose negative mean values of -0.750 and -0.383, suggesting variability in firm profitability and some occurrences of underperformance. The mean *EBIT* value is 2.461, which shows a range of operating performance across the firms. *Tobin_Q* on average reflects firms' market valuation relative to their asset base to be at 5.649.

The primary variables demonstrate interesting patterns. *Fin_Lit* displays a mean of 2.821 with a standard deviation of 0.226, suggesting moderate variability in state-level financial literacy across the United States. The *I_Fin_Lit* maintains similar statistics, reinforcing the robustness of the imputation process. Among the control variables, *Firm_Size* has a mean of 5.552, reflecting the diverse size of firms in the dataset. *Leverage*, *Cash_Holding*, *Book_to_Market*, *Stock_Return*, and *Sales_Growth* ratios present varied mean values of 0.185, 0.176, 0.593, 2.165, and 4.424, respectively, emphasizing their role in capturing different dimensions of financial health and valuation.

These descriptive statistics provide an understanding of the variable distributions. All variables are scaled and winsorized. Furthermore, the appropriate transformations and support of robustness of the study's methodology allow for a crucial interpretation of the broader implications of financial literacy on firm valuation and profitability. Table 2 reports the Descriptive Statistics.

[Table 2]

Correlation Matrix & Variance Inflation Factor (VIF)

Table 3 presents the Pearson correlation matrix and Variance Inflation Factor (VIF). Pearson correlation matrix examines the relationship among the dependent variables, financial variables, and key explanatory variables. Panel A provides a comprehensive view of potential multicollinearity issues and the direct relationships between variables. Within the dependent variables, *Fin_Lit* is positive and significantly correlated at 0.158 to *Market_Cap*, indicating that higher financial literacy is associated with a larger market capitalization. Hence, firms with more financially literate populations foster better investment decisions, in turn enhancing firm valuations in these regions. *Fin_Lit* to *Tobin_Q* is slightly negative and not statistically significant

at -0.048 and it may not have a clear or consistent impact on market efficiency and growth potential.

Fin_Lit to *ROA* is positive and highly significant at 0.016 and financial literacy is linked to better operational efficiency as firms within those literate states can better utilize assets to generate returns. *Fin_Lit* to *ROE*, though positive and significant, is weaker compared to *ROA* at 0.797. Financial literacy supports profitability and its effects on equity returns are moderated by other factors such as firm leverage and market conditions. *Fin_Lit* to *EBIT* is positive and highly significant at 0.760, which reflects improved operational profitability for firms in states with higher financial literacy. This is likely driven by informed consumer behavior and efficient financial practices. Within the control variables, *Fin_Lit* positively correlates with *Leverage* and *Book_to_Market* ratio. However, *Fin_Lit* has a negative correlation with *Firm_Size*, *Stock_Return*, and *Sales_Growth*.

Interestingly, *I_Fin_Lit* has a different result with a negative and significant correlation to *Market_Cap* at -0.159. This suggests that states with higher imputed financial literacy might have lower average market capitalization for firms, potentially due to better financial behavior and risk aversion discouraging speculative investment. *I_Fin_Lit* to *Tobin_Q* is negatively and insignificantly correlated suggesting that the imputed financial literacy index has minimal impact on *Tobin_Q*, highlighting that market efficiency or intangible asset valuation may not be strongly linked to financial literacy.

I_Fin_Lit to *ROA* is weak but has a significantly negative correlation at -0.023 implying that firms in financially literate states may focus on long-term strategies rather than short-term asset utilization efficiency. *I_Fin_Lit* to *ROE* is insignificant and is weakly negatively correlated at -0.009, indicating that imputed financial literacy does not directly influence the efficiency of

equity utilization. *I_Fin_Lit* to *EBIT* is significantly and negatively correlated at -0.107, inferring that higher financial literacy may discourage aggressive borrowing or excessive profitability-driven strategies, resulting in slightly reduced *EBIT* values. Regarding the control variables, *I_Fin_Lit* is negatively correlated with *Firm_Size*, *Cash_Holding*, and *Sales_Growth* respectively at -0.124, -0.009, and -0.108. On the other hand, *I_Fin_Lit* is positively correlated with *Leverage* and *Book_to_Market* at 0.083 and 0.020. Lastly, *I_Fin_Lit* is minimally correlated with no significance with *Stock_Return*.

Fin_Lit relies solely on observed data from NFCS, excluding any states and years with missing financial literacy scores. This creates gaps in the dataset and may result in biased correlations due to non-random missingness. Due to *Fin_Lit* being an incomplete sample, this led to a disproportionate representation of states and years with higher financial literacy where missing values are systematically related, leading to the results being distorted. Alternatively, *I_Fin_Lit* uses FCS imputation to estimate the missing financial literacy scores. This imputation process preserves relationships between *Fin_Lit* and other variables, altering the correlation matrix. The imputed index generally offers a more robust and representative picture of the relationships across the full dataset. *I_Fin_Lit* assumes relationships across the entire dataset, removing the underrepresentation of groups due to missing responses. The introduction of some degree of randomness and smoothness altered the correlations, effectively filling in gaps and allowing for analysis to cover all observations across states and years. Thus, making the FCS a viable approach to research with large missing data.

Panel B presents the Variance Inflation Factor (VIF) results, which measure the severity of multicollinearity in the regression models. VIF helps identify whether independent variables are highly correlated, potentially distorting the accuracy of regression coefficients. The VIF

interpretation follows a threshold-based approach, where values greater than 10 indicate high multicollinearity, requiring corrective action. In this case, *Firm_Size* has the highest VIF (~5.63), falling within the moderate concern range but not exceeding the critical threshold of 10. *Sales_Growth* and *Stock_Return* also exhibit higher VIF values (~4.55 and ~2.83, respectively), but remain within acceptable limits. Other variables, such as *Leverage*, *Book_to_Market*, and *Cash_Holding*, have VIF values around 1.2, indicating low multicollinearity concerns. *I_Fin_Lit* has a VIF of approximately 1.02, showing that financial literacy is not highly correlated with other predictors in the model.

Upon removing *Firm_Size*, the results remained relatively stable, indicating that while *Firm_Size* is correlated with other variables, it does not drastically impact the overall model fit. The coefficients for other independent variables remained relatively unchanged, and variables such as *Leverage*, *Cash_Holding*, and *Book_to_Market* showed minor adjustments but retained statistical significance. Given that removing *Firm_Size* did not significantly alter the model's explanatory power, the decision was made to retain it for improved interpretability and completeness of the analysis. However, researchers should remain cautious about multicollinearity, as high correlations among key financial variables may still influence model efficiency. Table 3 reports the Correlation Matrix and VIF.

[Table 3]

Baseline results with various Fixed Effect

Table 4 reports the baseline regression results, contributing insights into the study's hypothesis on the relationship between financial literacy and firm performance metrics. Panel A reports the regression results where the explanatory variables include *Fin_Lit*, the observed Financial Literacy Index, while Panel B incorporates *I_Fin_Lit*, the imputed index using Fully

Conditional Specification (FCS). The dependent variables analyzed include firm valuation metrics—*Market_Cap* and *Tobin_Q*—and profitability metrics—*ROA*, *ROE*, and *EBIT*.

By incorporating multiple fixed effects, this study isolates the impact of financial literacy on firm performance while controlling for external influences such as industry-specific trends, temporal factors, and geographical variations. The fixed effects included in this analysis are No Fixed Effect, Industry Fixed Effect, Year Fixed Effect, Industry-Year Fixed Effect, State Fixed Effect, State-Industry Fixed Effect, and State-Year Fixed Effect.

For firm valuation and without accounting for fixed effects, Panel A expresses that the *Fin_Lit* coefficient with *Market_Cap*, α_1 is -0.336 (t -stat = -11.68). Descriptive statistics in Table 2 show that the standard deviation of *Market_Cap* is 2.525 with a mean of 5.411. For instance, the coefficient for Market Capitalization ($\alpha_1 = -0.336$) can be interpreted using the average firm market value of approximately \$225.65 million. A 1-point rise in financial literacy translates to an estimated \$75.88 million decrease in market capitalization ($0.336 \times \$225.65$ million), reinforcing the idea that higher financial literacy encourages more conservative investor sentiment and pricing discipline. This highly statistically significant result suggests that higher financial literacy is associated with lower market capitalization. This counterintuitive result indicates a market correction effect where financial literacy enhances transparency, potentially mitigating overvaluations.

Whereas *Fin_Lit* coefficient with *Tobin_Q*, α_1 is 1.725 (t -stat = -2.6). Descriptive statistics in Table 2 show that the standard deviation of *Tobin_Q* is 24.67 with a mean of 5.649. Given that the average firm in the sample has a Tobin's Q of 5.649 and an implied average asset base of \$2.5 billion, the coefficient of -1.725 corresponds to a reduction of approximately \$4.31 billion in implied firm valuation ($-1.725 \times \$2.5$ billion). This suggests that financial literacy acts as a market

discipline mechanism, curbing speculative overvaluation and promoting more accurate pricing aligned with intrinsic value. These results are highly significant and align with the hypothesis that financial literacy positively impacts market efficiency.

Observing the profitability metrics, *Fin_Lit* coefficient with *ROA*, α_1 is 0.368 (t -stat = 4.11) with a standard deviation of 3.366 and a mean of -0.750. Assuming the average firm in the sample has a total asset base of approximately \$1.5 billion, the coefficient of 0.368 translates to an increase of approximately \$5.52 million in net operating income ($0.368 \times \$1.5 \text{ billion} \times 0.01$). This indicates that financial literacy improves firms' ability to generate returns from their assets. It reinforces the notion that financial literacy promotes effective resource allocation and imposes stronger accountability on asset utilization, ultimately enhancing operational performance. *Fin_Lit* coefficient for *ROE*, α_1 is 0.068 (t -stat = 1.38) with a standard deviation of 1.778 and a mean of -0.383. Base on an average equity base of \$750 million for firms in the sample, this estimate implies a potential increase of approximately \$510,000 in net income attributable to shareholders ($0.068 \times \$750 \text{ million} \times 0.01$). Despite this positive association, the lack of statistical significance indicates that the influence of financial literacy on equity returns is limited. These findings suggest that *ROE* is likely shaped more decisively by external financial dynamics—such as capital structure decisions, dividend policies, or broader equity market conditions—than by financial literacy alone.

With *EBIT*, the coefficient of *Fin_Lit*, α_1 is 0.147 (t -stat = 4.13). The standard deviation is 2.558 and the mean is 2.461. Presuming an average EBIT of \$11.6 million for firms in the sample, this coefficient translates to an approximate increase of \$1.71 million in operating income ($0.147 \times \$11.6 \text{ million}$). This positive and statistically significant result underscores the role of financial literacy in strengthening firms' core profitability by promoting more effective financial decision-

making, operational efficiency, and disciplined resource management.

When industry-specific effects are accounted for, the coefficient of *Fin_Lit* with *Market_Cap* remains negative, α_1 is -0.283 (t -stat = -10.7), reinforcing that financial literacy plays a significant role in mitigating firm overvaluation within industries. Interpreting this economically, and using the sample's average firm market capitalization of \$225.65 million, a 1-point increase in financial literacy corresponds to an estimated \$63.86 million decrease in market value ($0.283 \times \$225.65$ million). This suggests that financial literacy reduces speculative behavior in firm valuation, even when accounting for industry-specific factors such as competition dynamics, capital structure, and market trends. The negative coefficient implies that firms with higher financial literacy levels are more conservatively valued compared to their industry peers, as financially literate investors and managers likely engage in more rational valuation processes and avoid excessive market speculation.

The association with *Tobin_Q* becomes significantly negative ($\alpha_1 = -2.038$, t -stat = -3.09), indicating that within industries, firms with higher financial literacy levels exhibit more conservative valuations. To assess the economic significance of this estimate, consider that the average firm in the sample has a Tobin's Q of 5.649 and an implied asset base of \$2.5 billion. A 1-point increase in financial literacy is therefore associated with an approximate \$5.10 billion reduction in implied firm valuation ($2.038 \times \$2.5$ billion), highlighting the substantial impact financial literacy can have on curbing inflated valuations. Since *Tobin_Q* is a measure of how much investors are willing to pay relative to a firm's asset value, the stronger negative relationship suggests that financial literacy discourages inflated market expectations, potentially through better transparency, more realistic growth projections, and enhanced corporate governance practices within industries.

The impact on *ROA* turns positive ($\alpha_1 = 0.412$, $t\text{-stat} = 4.63$), indicating that financially literate firms within an industry are more efficient in utilizing their assets to generate returns. Given an average total asset base of \$1.5 billion across firms in the sample, this coefficient translates into an estimated \$6.18 million increase in net operating income ($0.412 \times \$1.5 \text{ billion} \times 0.01$) for every 1-point rise in financial literacy. This suggests that industry-wide factors do not diminish the positive effect of financial literacy on operational performance. Instead, financial literacy enables firms to optimize resource allocation, enhance productivity, and implement better financial management strategies, all of which contribute to stronger asset-based profitability.

The effect on *ROE* remains statistically insignificant ($\alpha_1 = 0.047$, $t\text{-stat} = 0.96$), indicating that financial literacy does not have a direct impact on returns to equity holders once industry-wide variations are accounted for. Consider an average equity base of \$750 million, this coefficient would correspond to an increase of approximately \$352,500 in net income attributable to shareholders ($0.047 \times \$750 \text{ million} \times 0.01$). However, due to the lack of statistical significance, this association should be interpreted with caution. Hence, *ROE* is influenced by financial leverage, dividend policies, and shareholder expectations. The lack of a strong relationship suggests that the impact of financial literacy on equity returns may be contingent on industry-specific capital structures, regulatory frameworks, and investor behaviors —elements that could overshadow the direct influence of financial literacy.

While *EBIT* remains negative ($\alpha_1 = -0.110$, $t\text{-stat} = -2.76$), suggesting that while financial literacy improves operational efficiency (as reflected in *ROA*), it does not necessarily translate into immediate improvements in earnings before interest and taxes. Drawing from the observed mean *EBIT* of \$11.6 million, a 1-point increase in financial literacy corresponds to an estimated reduction of approximately \$1.28 million in operating income ($-0.110 \times \$11.6 \text{ million}$). This could

be due to financially literate firms making strategic long-term investments in productivity-enhancing assets, workforce training, or innovation, which might initially depress short-term earnings. Additionally, firms in financially literate environments may focus on sustainability and compliance, leading to increased near-costs that temporarily impact *EBIT*, which ultimately support long-term value creation.

With year fixed effects, the coefficient of *Fin_Lit* with *Market_Cap* weakens to -0.0162 (t -stat = -0.34), meaning that once macroeconomic fluctuations and external economic shocks are accounted for, financial literacy's impact on firm valuation diminishes. Translating this into economic terms, using the average firm market capitalization of approximately \$225.65 million, this coefficient implies a modest \$3.66 million decline in firm value ($-0.0162 \times \$225.65$ million) for a 1-point increase in financial literacy. This suggests that variations in firm value over time are likely driven by broader economic forces—such as interest rate changes, inflationary trends, and global financial conditions—rather than financial literacy itself. The loss of statistical significance indicates that financial literacy may influence valuation at the firm level but does not hold as strong of an effect when aggregated across different time periods. However, the impact on *Tobin_Q* remains strongly negative ($\alpha_1 = -2.299$, t -stat = -2.08), reinforcing the idea that financial literacy plays a role in reducing speculative overvaluation and improving market efficiency. Applying this estimate to the typical firm in the dataset—one with an implied asset base of \$2.5 billion—a 1-point increase in financial literacy corresponds to a reduction of approximately \$5.75 billion in implied firm valuation ($-2.299 \times \$2.5$ billion). Even after adjusting for year-based external shocks, financially literate firms appear to be more conservatively valued, reflecting a more informed and disciplined approach to market expectations.

The effect on *ROA* remains positive and statistically significant ($\alpha_1 = 0.486$, t -stat = 3.26),

suggesting that financial literacy continues to drive operational efficiency over time. Using the average total asset base of \$1.5 billion from the sample, this coefficient implies an increase of approximately \$7.29 million in net operating income for every one-point rise in financial literacy ($0.486 \times \$1.5 \text{ billion} \times 0.01$). This implies that financially literate firms adopt better asset utilization strategies and optimize their operational performance in ways that persist across different economic cycles. The fact that *ROA* remains robust after controlling for time effects suggests that firms with higher financial literacy levels benefit from better long-term decision-making, cost efficiency, and capital allocation strategies.

Regarding *ROE*, the coefficient remains statistically insignificant ($\alpha_1 = -0.0414$, $t\text{-stat} = -0.50$). Applying this estimate to an average equity base of \$750 million, the marginal effect would equate to a decline of approximately \$310,500 in shareholder net income ($-0.0414 \times \$750 \text{ million} \times 0.01$). This suggests that financial literacy does not have a strong or direct impact on shareholders' returns once macroeconomic fluctuations are controlled for. Since *ROE* is heavily influenced by financial leverage and external equity market conditions, the lack of a strong relationship indicates that firm-level financial literacy may not be the primary driver of returns to equity holders, especially in the presence of broader economic forces that affect shareholder value, such as market volatility, interest rates, and investor sentiment.

For *EBIT*, the coefficient is -0.126 ($t\text{-stat} = -1.89$), indicating a minimal or insignificant impact of financial literacy on earnings before interest and taxes after controlling for macroeconomic factors. Using the sample's average EBIT of \$11.6 million, this coefficient suggests a potential decrease of approximately \$1.46 million in EBIT for every 1-point increase in financial literacy ($-0.126 \times \$11.6 \text{ million}$). While this magnitude appears economically notable, its lack of statistical significance tempers the reliability of this effect. This result implies that while

financial literacy helps firms allocate resources efficiently (as evidenced by *ROA*), it does not necessarily translate into immediate profitability improvements, possibly due to structural constraints or industry-specific economic conditions that dominate firm earnings.

When controlling for state fixed effects, the coefficient of *Fin_Lit* with *Market_Cap* remains negative ($\alpha_1 = -0.421$, $t\text{-stat} = -12.76$), reinforcing that financial literacy reduces firm overvaluation even when accounting for state-specific economic conditions and regulatory environments. Translating this into economic terms, and based on the sample's average market capitalization of approximately \$225.65 million, a 1-point increase in financial literacy is associated with an estimated \$95 million decrease in firm market value ($-0.421 \times \$225.65 \text{ million}$). This substantial effect illustrates how financial literacy contributes to more tempered and disciplined investor sentiment at the state level. This suggests that firms operating in financially literate states tend to be more fairly valued, with reduced speculative pricing and improved investor awareness. The results indicate that financial literacy aligns firm valuations more closely with intrinsic fundamentals, discouraging excessive market optimism or financial misreporting. The coefficient of *Tobin_Q*, while negative ($\alpha_1 = -0.838$, $t\text{-stat} = -1.08$), is not statistically significant, implying that financial literacy's effect on speculative valuation efficiency at the state level is weaker or driven by external industry-level or macroeconomic forces. Interpreted economically, and using the assumed average asset base of \$2.5 billion, this coefficient would correspond to a potential reduction of approximately \$2.10 billion in implied firm valuation ($-0.838 \times \$2.5 \text{ billion}$) for each 1-point increase in financial literacy. This suggests that, while financial literacy plays a role in firm valuation, state-wide differences in financial regulation, economic development, or investor behavior may overshadow its direct impact on *Tobin_Q*.

For profitability metrics, *ROA* remains positive and statistically significant ($\alpha_1 = 0.202$, $t\text{-}$

stat = 1.92), indicating that financial literacy enhances operational efficiency at the state level. Applying this coefficient to the estimated average total asset base of \$1.5 billion implies an increase of approximately \$3.03 million in net operating income ($0.202 \times \$1.5 \text{ billion} \times 0.01$) for each 1-point rise in financial literacy. This suggests that firms in states with higher financial literacy levels tend to use their assets more efficiently, minimize unnecessary costs, and make better financial planning decisions. For *EBIT*, the coefficient is positive and statistically significant ($\alpha_1 = 0.317$, $t\text{-stat} = 6.73$), indicating that financial literacy enhances operational profitability at the state level. . Using the sample's average EBIT of approximately \$11.6 million, a 1-point increase in financial literacy corresponds to an estimated increase of \$3.68 million in earnings before interest and taxes ($0.317 \times \$11.6 \text{ million}$). This result suggests that financially literate environments promote better financial decision-making, improved cost efficiency, and sustainable profit margins. The strong significance of *EBIT* highlights that financial literacy is beneficial for firms in managing their core earnings, allowing for better financial discipline and operational control.

The coefficient for *ROE* is positive but statistically insignificant (c 0.092, $t\text{-stat} = 1.57$), reinforcing previous findings that financial literacy does not strongly influence equity-based returns when controlling for state-wide financial conditions. Assuming an average equity base of \$750 million, this coefficient implies a potential increase of approximately \$690,000 in net income attributable to shareholders ($0.092 \times \$750 \text{ million} \times 0.01$). Since *ROE* depends on firm-specific financial policies, leverage, and external equity market performance, the weak statistical significance suggests that other structural factors may play a more dominant role in determining shareholder returns than financial literacy alone.

When accounting for state-industry fixed effects, the coefficient of *Fin_Lit* with

Market_Cap remains negative ($\alpha_1 = -0.330$, $t\text{-stat} = -10.75$), confirming that financial literacy reduces firm overvaluation across both state and industry settings. Using the average firm market capitalization of \$225.65 million, this coefficient translates to an estimated decline of approximately \$74.46 million ($0.330 \times \225.65 million) in firm value for a 1-point increase in financial literacy. This suggests that firms operating in financially literate states and industries are systematically less prone to overvaluation, likely due to more informed investor behavior, stronger financial management practices, and heightened regulatory expectations. The consistent negative coefficient across various models reinforces that financial literacy leads to better valuation discipline and prevents excessive market optimism or speculative pricing. The association with *Tobin_Q* remains significantly negative ($\alpha_1 = -1.851$, $t\text{-stat} = -2.39$), indicating that financial literacy continues to improve valuation efficiency at the state-industry level. Considering the average firm asset base of \$2.5 billion, this coefficient implies a reduction of approximately \$4.63 billion in implied market valuation ($1.851 \times \$2.5 \text{ billion}$) for each one-point increase in financial literacy. This suggests that financially literate environments curb speculative pricing behaviors, forcing firms to be more transparent and align valuations with intrinsic fundamentals. The persistence of this negative relationship across state and industry contexts suggests that investors in financially literate states scrutinize firm valuations more carefully, discouraging inflated stock prices and speculative trading.

For *ROA*, the coefficient remains positive and statistically significant ($\alpha_1 = 0.338$, $t\text{-stat} = 3.24$), reinforcing that financial literacy enhances operational efficiency at the state-industry level. Applying this estimate to the average firm asset base of \$1.5 billion, a one-point increase in financial literacy corresponds to an approximate rise of \$5.07 million in net operating income ($0.338 \times \$1.5 \text{ billion} \times 0.01$). This result suggests that firms in industries with financially literate

investors and managers exhibit better asset utilization, stronger financial planning, and improved cost control strategies. The findings further support the notion that financial literacy fosters a corporate culture of efficiency and responsible financial decision-making. For *EBIT*, the coefficient remains positive and statistically significant ($\alpha_1 = 0.236$, $t\text{-stat} = 5.04$), indicating that financial literacy contributes to improved operational profitability when controlling for both state and industry factors. Considering the average EBIT of \$11.6 million, this coefficient suggests an approximate increase of \$2.74 million in earnings before interest and taxes ($0.236 \times \$11.6 \text{ million}$) for each one-point rise in financial literacy. This suggests that firms in financially literate environments are more likely to engage in efficient financial planning, reduce unnecessary costs, and sustain stronger profit margins. The findings highlight that financial literacy creates an environment where firms prioritize sustainable earnings growth and avoid financial mismanagement.

The coefficient for *ROE* remains statistically insignificant ($\alpha_1 = 0.050$, $t\text{-stat} = 0.86$), suggesting that financial literacy does not have a strong direct effect on shareholder returns when controlling for both state-wide and industry-specific factors. Using an estimated average equity base of \$750 million, this coefficient translates to a modest potential increase of \$375,000 in net income attributable to shareholders ($0.050 \times \$750 \text{ million} \times 0.01$). Since *ROE* is heavily influenced by firm-specific financial strategies, dividend policies, and external capital market conditions, the lack of a significant effect implies that financial literacy's role in determining equity returns is secondary to broader financial market forces and firm-level capital structure decisions.

Panel B extends the analysis by utilizing *I_Fin_Lit* as the explanatory variable, incorporating imputed financial literacy data. Without accounting for fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* is positive and highly significant ($\alpha_1 = 0.342$, $t\text{-stat} = -24.54$),

suggesting that financial literacy is associated with higher firm valuations. Given an average market capitalization of approximately \$225.65 million, a 1-point increase in imputed financial literacy corresponds to an estimated \$77.18 million rise in firm value ($0.342 \times \$225.65$ million). This result contrasts with previous findings where financial literacy typically reduces overvaluation, implying that when external influences such as industry and geographic differences are not controlled, financially literate firms may be perceived as having stronger fundamentals, leading to increased investor confidence and market capitalization. However, the coefficient of *Tobin_Q* is negative and highly significant ($\alpha_1 = -2.41$, $t\text{-stat} = -7.43$), indicating that financial literacy reduces speculative valuations. Considering that the average firm has an implied asset base of \$2.5 billion, this coefficient translates to a reduction of approximately \$6.03 billion in implied firm value for each 1-point increase in financial literacy ($2.41 \times \$2.5$ billion). This substantial decrease suggests that firms in financially literate environments may be less likely to experience inflated price-to-book ratios, as investors are more critical of excessive growth projections and overestimated firm value.

For profitability metrics, *ROA* is negatively significant ($\alpha_1 = -0.233$, $t\text{-stat} = 5.47$), suggesting that firms with higher financial literacy levels tend to impose stricter financial controls and asset efficiency measures, which may lead to short-term reductions in return on assets. A 1-point increase in financial literacy, applied to a firm with an average asset base of \$1.5 billion, would be associated with a reduction of approximately \$3.50 million in net operating income ($-0.233 \times \$1.5 \text{ billion} \times 0.01$). While seemingly adverse, these results could indicate increased reinvestment into long-term growth strategies rather than immediate profit extraction. For *EBIT*, the coefficient is insignificant ($\alpha_1 = 0.013$, $t\text{-stat} = 0.71$), implying that financial literacy does not significantly impact core operational profitability when broader market influences are unaccounted

for. Applying this estimate to the average *EBIT* of \$11.6 million, a 1-point increase in financial literacy would correspond to a modest gain of approximately \$151,000 ($0.013 \times \11.6 million). This lack of significance suggests that other firm-level characteristics such as industry, financial strategy, or operational scale may be stronger determinants of *EBIT* than financial literacy alone.

The coefficient for *ROE* is negative and statistically insignificant ($\alpha_1 = -0.123$, $t\text{-stat} = -0.49$), reinforcing the idea that financial literacy does not have a direct influence on shareholder returns when no external fixed effects are applied. Using an estimated average equity base of \$750 million, a 1-point increase in financial literacy would equate to a reduction of approximately \$922,500 in net income attributable to shareholders ($-0.123 \times \$750 \text{ million} \times 0.01$). This suggests that factors such as firm leverage, dividend policies, and equity market conditions may be more influential in shaping *ROE* than financial literacy alone.

When controlling for industry fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* remains negative ($\alpha_1 = -0.286$, $t\text{-stat} = -22.42$), reinforcing that financial literacy reduces firm overvaluation even when accounting for industry-specific characteristics. Applying this estimate to the average firm market capitalization of \$225.65 million, a 1-point increase in financial literacy is associated with a \$64.53 million decrease in market value ($-0.286 \times \$225.65 \text{ million}$). This suggests that firms operating in financially literate environments across industries tend to be valued more conservatively, reducing the likelihood of excessive speculative pricing. The significance of this finding indicates that financial literacy influences firm valuation beyond general economic conditions and is a crucial factor in shaping industry-level market efficiency. The coefficient of *Tobin_Q* is significantly negative ($\alpha_1 = -2.591$, $t\text{-stat} = -8.01$), highlighting that higher financial literacy within an industry leads to more conservative firm valuations. Using an example where given an average asset base of \$2.5 billion, a 1-point increase in financial literacy corresponds to

a \$6.48 billion reduction in implied firm value ($-2.591 \times \$2.5$ billion). This result suggests that in financially literate industries, investors may demand greater financial transparency and avoid overvaluing firms based on speculative or inflated growth expectations. These results confirm that financial literacy serves as a market correction tool, particularly in industries prone to speculative pricing or volatile earnings expectations.

For profitability metrics, *ROA* remains positive and statistically significant ($\alpha_1 = 0.260$, t -stat = 6.16), indicating that financial literacy enhances operational efficiency across industries. Assuming an average asset base of \$1.5 billion, a 1-point increase in financial literacy corresponds to an approximate \$3.90 million increase in net operating income ($0.260 \times \$1.5 \text{ billion} \times 0.01$). This result suggests that industries with higher financial literacy benefit from improved resource allocation, cost management, and long-term financial planning, leading to better returns on assets. The coefficient for *ROE* is negative but statistically insignificant ($\alpha_1 = -0.023$, t -stat = -0.93), suggesting that financial literacy does not significantly impact equity-based returns within industry-specific contexts. Taking an average equity base of \$750 million, a 1-point increase in financial literacy would equate to a decrease of approximately \$172,500 in net income attributable to shareholders ($-0.023 \times \$750 \text{ million} \times 0.01$). Given that *ROE* is influenced by external financial factors such as capital structure, dividend policies, and industry-specific risk tolerance, financial literacy's impact may be overshadowed by these broader financial determinants. For *EBIT*, the coefficient is negative and statistically insignificant ($\alpha_1 = -0.012$, t -stat = -0.67), indicating that financial literacy does not have a direct influence on core operational profitability when controlling for industry-wide factors. Using the sample's average *EBIT* of \$11.6 million, a 1-point increase in financial literacy corresponds to an estimated decline of approximately \$139,000 in operating income ($-0.012 \times \$11.6 \text{ million}$). This suggests that profitability in various industries may depend

more on sector-specific operational efficiencies, competitive dynamics, and market conditions rather than financial literacy alone.

When controlling for year fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* remains negative and significant ($\alpha_1 = -0.299$, $t\text{-stat} = -20.22$), confirming that financial literacy consistently reduces firm overvaluation over time. Drawing on the average firm market capitalization of approximately \$225.65 million, this coefficient suggests that a 1-point increase in financial literacy is associated with a decline of about \$67.5 million in firm value ($-0.299 \times \$225.65 \text{ million}$). This result suggests that financial literacy plays a role in mitigating speculative firm valuations, even after accounting for macroeconomic trends, policy shifts, and economic cycles. The persistence of a negative *Market_Cap* coefficient across time further reinforces that financial literacy promotes stable and efficient market valuations. The coefficient of *Tobin_Q* is also negative and significant ($\alpha_1 = -2.192$, $t\text{-stat} = -6.35$), highlighting that financial literacy helps correct speculative overvaluation, leading to more accurate market expectations of firm performance. Using an average asset base of \$2.5 billion, this coefficient suggests that a 1-point increase in financial literacy corresponds to a reduction of approximately \$5.48 billion in implied firm valuation ($-2.192 \times \$2.5 \text{ billion}$), underscoring the material impact of financial literacy on investor behavior. This suggests that investors in financially literate environments are more cautious about speculative pricing and require more transparent financial disclosures, reducing inflated firm valuations over time.

Within profitability metrics, *ROA* remains positive and statistically significant ($\alpha_1 = 0.195$, $t\text{-stat} = 4.31$), indicating that financial literacy improves firms' ability to efficiently allocate assets and generate higher returns on investments over time. Assuming an average asset base of \$1.5 billion, this coefficient translates into an approximate \$2.93 million increase in net operating

income for each one-point rise in financial literacy ($0.195 \times \$1.5 \text{ billion} \times 0.01$). This result suggests that over the years, financial literacy contributes to firms becoming more effective in cost control, resource allocation, and operational efficiency. The coefficient for *ROE* is negative and statistically insignificant ($\alpha_1 = -0.031$, $t\text{-stat} = -1.18$), suggesting that financial literacy does not have a strong direct impact on shareholder equity returns over time. Using an estimated average equity base of \$750 million, this coefficient implies a potential decrease of roughly \$232,500 in shareholder returns for each 1-point increase in financial literacy ($-0.031 \times \$750 \text{ million} \times 0.01$). Since *ROE* is influenced by external capital market conditions, financial leverage, and firm-specific investment strategies, the lack of significance implies that other market forces may play a more dominant role in shaping equity-based profitability over time rather than financial literacy alone. For *EBIT*, the coefficient is negative but statistically insignificant ($\alpha_1 = -0.010$, $t\text{-stat} = -0.51$), indicating that financial literacy does not have a direct impact on core operational profitability when accounting for macroeconomic fluctuations. Based on an average *EBIT* of \$11.6 million, this coefficient equates to a modest decline of approximately \$116,000 in earnings before interest and taxes for each 1-point rise in financial literacy ($-0.010 \times \$11.6 \text{ million}$). This suggests that profitability is influenced more by industry-specific factors, cost structures, and competitive pressures rather than financial literacy alone.

When considering industry-year fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* remains negative and highly significant ($\alpha_1 = -0.254$, $t\text{-stat} = -18.79$), reinforcing the notion that financial literacy continues to curb firm overvaluation even when controlling for industry-wide trends and yearly fluctuations. Applying this estimate to the average market capitalization of \$225.65 million, a 1-point increase in financial literacy corresponds to a decline of approximately \$57.31 million in firm valuation ($-0.254 \times \$225.65 \text{ million}$). This suggests that

financially literate firms within specific industries are valued more conservatively, as financial literacy promotes greater transparency, disciplined financial management, and investor skepticism toward speculative valuations. Similarly, the coefficient for *Tobin_Q* is strongly negative ($\alpha_1 = -2.284$, $t\text{-stat} = -6.65$), emphasizing that financial literacy acts as a market-correcting force that discourages excessive optimism and inflated firm valuations within industries over time. Taking an average asset base of \$2.5 billion, a 1-point increase in financial literacy translates to a reduction of approximately \$5.71 billion in implied firm valuation ($-2.284 \times \$2.5 \text{ billion}$), underscoring how financial literacy dampens speculative premiums and anchors valuations to more realistic performance expectations. The results indicate that as firms become financially literate, investors and stakeholders become more critical of overvaluation, leading to more efficient and fair firm valuations. This trend further suggests that financial literacy reduces asymmetric information in capital markets, ultimately preventing speculative pricing distortions.

For profitability metrics, *ROA* exhibits a positive and significant coefficient ($\alpha_1 = 0.207$, $t\text{-stat} = 4.62$), underscoring that financial literacy contributes to operational efficiency, asset optimization, and improved financial decision-making within industries across different years. Taking into account an average asset base of \$1.5 billion, this coefficient implies an estimated \$3.10 million increase in net operating income ($0.207 \times \$1.5 \text{ billion} \times 0.01$) for every 1-point rise in financial literacy. The positive relationship suggests that firms operating in financially literate industries are more adept at leveraging their resources efficiently, streamlining costs, and making informed investment decisions, resulting in better asset utilization and stronger financial health.

On the other hand, the coefficient for *ROE* remains statistically insignificant ($\alpha_1 = -0.0387$, $t\text{-stat} = -1.45$), implying that financial literacy does not significantly influence shareholder returns when controlling for both industry-specific and yearly variations. Using an average equity base of

\$750 million, this coefficient translates to an estimated decrease of approximately \$290,250 in net income attributable to shareholders ($-0.0387 \times \$750 \text{ million} \times 0.01$) for each one-point increase in financial literacy. This outcome aligns with previous findings that suggest equity-based profitability is influenced by a complex mix of external financing conditions, industry competition, and firm-specific financial strategies, which financial literacy alone cannot significantly alter. Regarding *EBIT*, the coefficient remains statistically insignificant ($\alpha_1 = -0.025$, $t\text{-stat} = -1.27$), indicating that financial literacy's direct impact on operating income is weak when accounting for both industry-wide and yearly economic shifts. Taking into account an average EBIT of \$11.6 million, this estimate implies a potential decrease of approximately \$290,000 in earnings before interest and taxes ($-0.025 \times \$11.6 \text{ million}$) per 1-point increase in financial literacy. This suggests that profitability improvements associated with financial literacy might take longer to materialize due to industry-specific cost structures, regulatory constraints, or strategic reinvestment into operations.

When controlling for state fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* remains negative ($\alpha_1 = -0.324$, $t\text{-stat} = -23.73$), reinforcing that financial literacy plays a vital role in reducing firm overvaluation even when considering state-specific economic conditions and regulatory factors. Translating this into economic terms, a 1-point increase in financial literacy corresponds to an estimated \$73.1 million reduction in firm market capitalization, based on an average market value of approximately \$225.65 million. This suggests that firms in financially literate states are less prone to speculative pricing, fostering a market environment where valuations are more reflective of intrinsic fundamentals rather than excessive market optimism. Similarly, the coefficient of *Tobin_Q* is negative and statistically significant ($\alpha_1 = -2.151$, $t\text{-stat} = -6.57$), indicating that financial literacy contributes to valuation efficiency by mitigating inflated

expectations and speculative tendencies at the state level. Economically, with an implied average asset base of \$2.5 billion, a 1-point increase in financial literacy is associated with a \$5.38 billion decrease in implied firm valuation ($-2.151 \times \$2.5 \text{ billion}$), illustrating the powerful market-correcting influence of financial literacy. This finding suggests that financially literate investors and firms in certain states adopt more conservative valuation approaches, aligning stock prices more closely with fundamental financial performance.

Turning to profitability metrics, *ROA* remains positive and highly significant ($\alpha_1 = 0.201$, $t\text{-stat} = 4.69$), underscoring that financial literacy enhances operational efficiency by improving asset utilization and cost management. Quantitatively, for a firm with an average asset base of \$1.5 billion, a 1-point increase in financial literacy corresponds to an estimated \$3.02 million increase in net operating income ($0.201 \times \$1.5 \text{ billion} \times 0.01$). The positive coefficient signals that firms in financially literate states allocate resources more effectively, leading to improved return generation on assets. For *EBIT*, the coefficient is positive but weakly significant ($\alpha_1 = 0.024$, $t\text{-stat} = 1.28$), suggesting that while financial literacy contributes to operational decision-making, its impact on overall profitability may be constrained by industry-specific cost structures, competitive market conditions, or macroeconomic influences at the state level. Translating this into monetary terms, and using the average *EBIT* of \$11.6 million, a 1-point increase in financial literacy is associated with an estimated \$278,400 boost in operating income ($0.024 \times \$11.6 \text{ million}$). On the other hand, *ROE* remains statistically insignificant ($\alpha_1 = -0.005$, $t\text{-stat} = -0.21$), implying that financial literacy does not directly influence equity-based returns when accounting for state-level financial dynamics. Using an estimated average equity base of \$750 million, this coefficient equates to a negligible change of just \$37,500 in shareholder returns per 1-point increase in financial literacy ($-0.005 \times \$750 \text{ million} \times 0.01$). Given that *ROE* is largely affected by leverage structures, investor

sentiment, and external market conditions, the absence of a strong relationship suggests that factors outside financial literacy may have a greater influence on shareholder returns.

When controlling for state-industry fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* remains negative and highly significant ($\alpha_1 = -0.261$, $t\text{-stat} = -20.20$), reaffirming the notion that financial literacy reduces speculative market valuation, even after accounting for both state-level and industry-wide economic influences. Based on an average market capitalization of \$225.65 million, a 1-point increase in financial literacy corresponds to an approximate \$58.90 million reduction in firm valuation ($-0.261 \times \$225.65 \text{ million}$). This result suggests that firms operating in financially literate states and industries experience more rational and transparent valuations, minimizing the likelihood of overvaluation due to investor sentiment or market hype. Likewise, the coefficient of *Tobin_Q* is negative and strongly significant ($\alpha_1 = -2.368$, $t\text{-stat} = -7.31$), reinforcing the idea that financial literacy plays a crucial role in enhancing valuation efficiency across industries and states. Given an average firm asset base of \$2.5 billion, this coefficient implies a reduction of approximately \$5.92 billion in implied firm valuation for every 1-point increase in financial literacy ($-2.368 \times \$2.5 \text{ billion}$). This finding implies that financial literacy helps curb excessive expectations about firm performance, leading to valuations that are more aligned with financial fundamentals rather than speculative optimism.

Shifting focus to profitability metrics, *ROA* remains positive and statistically significant ($\alpha_1 = 0.246$, $t\text{-stat} = 5.66$), demonstrating that financial literacy enhances firms' ability to optimize asset utilization and operational efficiency. Using a representative asset base of \$1.5 billion, this estimate implies an increase of approximately \$3.69 million in net operating income for every 1-point rise in financial literacy ($0.246 \times \$1.5 \text{ billion} \times 0.01$). This indicates that financial literacy encourages firms to focus on sustainable financial management practices that improve

profitability, ensuring that assets are employed more effectively to generate returns. However, the coefficient for *ROE* remains statistically insignificant ($\alpha_1 = -0.027$, $t\text{-stat} = -1.07$), indicating that financial literacy does not significantly impact equity-based returns once state and industry-specific effects are considered. Assuming an average equity base of \$750 million, this translates to a relatively modest estimated decrease of about \$202,500 in shareholder returns ($-0.027 \times \$750 \text{ million} \times 0.01$) for a 1-point increase in financial literacy. Given that *ROE* is often influenced by leverage, market conditions, and corporate financial policies, the results suggest that financial literacy's effect on shareholder returns may be diluted by broader capital market dynamics and firm-level financing decisions.

For *EBIT*, the coefficient remains negative and statistically insignificant ($\alpha_1 = -0.005$, $t\text{-stat} = -0.30$), suggesting that while financial literacy fosters operational efficiency, its impact on earnings before interest and taxes is not strong enough to produce significant changes in profitability when both state and industry factors are considered. Using the sample's average *EBIT* of \$11.6 million, a 1-point increase in financial literacy corresponds to a negligible reduction of approximately \$58,000 ($-0.005 \times \11.6 million). This result implies that financial literacy's impact on profitability may be more pronounced in firms with lower financial constraints, whereas industry-wide cost structures and market competition may play a larger role in determining *EBIT*.

When accounting for state-year fixed effects, the coefficient of *I_Fin_Lit* with *Market_Cap* remains negative and highly significant ($\alpha_1 = -0.285$, $t\text{-stat} = -18.93$), reinforcing the argument that financial literacy plays a crucial role in reducing firm overvaluation over time and across different geographical regions. Translating this into practical terms, a 1-point increase in financial literacy corresponds to an approximate \$64.31 million decrease in market capitalization ($-0.285 \times \$225.65 \text{ million}$, based on the average firm value). This result suggests that financially literate

environments promote rational valuation practices that minimize speculative pricing, ensuring that firms are valued more accurately based on their financial fundamentals rather than market hype. In a similar vein, the coefficient of *Tobin_Q* remains negative and statistically significant ($\alpha_1 = -1.786$, $t\text{-stat} = -5.07$), further confirming that financial literacy enhances valuation efficiency across both time and state-level economic conditions. For example, an average firm asset base of approximately \$2.5 billion, this coefficient implies a \$4.47 billion reduction in implied firm valuation for every 1-point increase in financial literacy ($-1.786 \times \$2.5 \text{ billion}$). This finding highlights how financial literacy helps mitigate excessive market expectations and correct over-optimistic projections, leading to a more stable and transparent investment climate.

Turning to profitability metrics, *ROA* remains positive and statistically significant ($\alpha_1 = 0.185$, $t\text{-stat} = 3.92$), demonstrating that financial literacy positively influences firms' ability to manage resources and optimize asset utilization. To demonstrate, with an average asset base of \$1.5 billion, a 1-point increase in financial literacy corresponds to an estimated \$2.78 million increase in net operating income ($0.185 \times \$1.5 \text{ billion} \times 0.01$). This suggests that financial literacy fosters strategic decision-making that enhances operational efficiency, allowing firms to generate higher returns on their assets over time and across different states' economies. However, *ROE* remains statistically insignificant ($\alpha_1 = -0.0304$, $t\text{-stat} = -1.07$), indicating that financial literacy does not exert a direct impact on shareholder returns when accounting for both temporal and geographic economic differences. To illustrate using an estimated average equity base of \$750 million, this coefficient suggests a modest reduction of approximately \$228,000 in net income attributable to shareholders ($-0.0304 \times \$750 \text{ million} \times 0.01$) per 1-point increase in financial literacy. Given that *ROE* is influenced by external financial market conditions, corporate dividend policies, and firm-specific financial strategies, these results imply that financial literacy's effect on

equity-based profitability may be overshadowed by broader macroeconomic and firm-level financial dynamics. For *EBIT*, the coefficient remains negative and statistically weak ($\alpha_1 = -0.002$, $t\text{-stat} = -0.11$), suggesting that while financial literacy encourages firms to be more efficient, its effect on core profitability remains minimal when state and year variations are considered. For instance, based on the average EBIT of \$11.6 million, this coefficient translates to an inconsequential decrease of about \$23,200 ($-0.002 \times \11.6 million) in earnings per 1-point increase in financial literacy. This result implies that industry-wide cost structures, competitive market dynamics, and external financial constraints may have a more pronounced influence on *EBIT* than financial literacy alone.

The control variables included in the regression models—*Firm_Size*, *Leverage*, *Cash_Holding*, *Book_to_Market*, *Stock_Return*, and *Sales_Growth*—play a crucial role in explaining firm valuation and profitability across different fixed effect specifications. These variables demonstrate consistent patterns across models, reinforcing their robustness in shaping firm performance. While some control variables exhibit strong, repetitive trends, others show context-dependent variations, suggesting that their impact fluctuates based on macroeconomic, industry, or firm-specific factors.

Firm_Size is a key driver of market valuation and efficiency, frequently included in firm performance studies (e.g., Titman & Wessels, 1988; Demsetz & Villalonga, 2001). *Firm_Size* consistently demonstrates a strong positive influence on *Market_Cap*, *ROA*, and *EBIT* across all fixed effect models, reinforcing the idea that larger firms enjoy better investor confidence, economies of scale, and operational efficiency. The negative relationship with *Tobin_Q* suggests that larger firms tend to have valuations that align more closely with their tangible assets, whereas smaller firms may experience speculative pricing. The negative or statistically insignificant effect

on *ROE* implies that while larger firms enhance operational performance, their equity returns are not necessarily higher due to factors such as retained earnings, conservative capital structures, and shareholder expectations.

Leverage is a double-edged sword for firms, as discussed in Modigliani & Miller (1958) and later empirical work (e.g., Rajan & Zingales, 1995). Leverage presents mixed results, highlighting its dual nature in influencing firm performance. While it positively affects *Market_Cap* and *Tobin_Q*, indicating that firms with higher leverage may be perceived as more valuable due to their ability to finance growth through debt, it negatively impacts *ROA*, demonstrating that higher financial obligations restrict firms' ability to efficiently utilize assets. The positive effect on *ROE* in some models suggests that leverage can amplify shareholder returns, but the negative coefficients in others indicate that excessive debt introduces financial distress, eroding equity value. Similarly, the impact on *EBIT* fluctuates, reinforcing that moderate debt can enhance profitability, but excessive leverage imposes interest costs that limit core earnings.

Cash_Holding enhances valuation but reduces shareholder returns, based on insights from Opler et al. (1999), who highlight the signaling and precautionary roles of cash reserves. The role of *Cash_Holding* in firm performance remains context-specific. Higher cash reserves positively impact *Market_Cap* and *Tobin_Q*, suggesting that investors view liquidity as a risk buffer and a sign of financial strength. However, the negative effect on *ROE* indicates that excessive cash holdings may signal inefficient capital deployment, as firms fail to reinvest in high-return projects. The positive relationship between *ROA* and *EBIT* in select models suggests that firms with sufficient liquidity can optimize asset utilization and sustain profitability, but when firms hold excessive cash without strategic deployment, the benefits to shareholders diminish.

Book_to_Market ratio is a reflection of market perception, drawing on the Fama and French

(1992) asset pricing framework. *Book_to_Market* ratio consistently displays a negative relationship with *Market_Cap* and *Tobin_Q*, reinforcing that higher book-to-market firms are perceived as undervalued or financially constrained, leading to lower investor confidence. However, its positive influence on *ROA* and *EBIT* indicates that these firms may have stronger internal financial performance, benefiting from conservative accounting, efficient cost structures, and lower reliance on speculative investment strategies. The negative impact on *ROE* suggests that while these firms are operationally strong, they struggle to translate that efficiency into high shareholder returns, likely due to limited access to equity financing and slower growth trajectories.

Stock_Return is widely used as a key indicator of firm performance (Barber and Lyon, 1997). *Stock_Return* emerges as one of the most consistently positive predictors of both valuation and profitability, reinforcing its role as a key determinant of firm success. Higher stock returns enhance *Market_Cap* and *Tobin_Q*, demonstrating that strong market performance boosts investor confidence and firm valuation. Additionally, the positive relationships with *ROA*, *ROE*, and *EBIT* confirm that firms with robust stock returns also exhibit superior operational efficiency, shareholder value, and profitability. This suggests that firms with sustained stock performance benefit from a reinforcing cycle of strong investor sentiment, efficient management, and profitable operations.

Sales_Growth is broadly recognized as a primary driver for firm success (e.g., Penman, 2001). *Sales_Growth* remains a dominant factor in firm valuation and profitability. Its positive effect on *Market_Cap* and *Tobin_Q* confirms that higher revenue growth attracts investors, leading to increased market valuation. The strong positive influence on *ROA* and *EBIT* suggests that firms with consistent sales growth effectively translate revenue expansion into profitability and operational efficiency. The positive impact on *ROE* highlights that revenue growth plays a crucial

role in enhancing shareholder value, reinforcing its significance as a key financial driver.

The results from the baseline regression analysis provide compelling evidence that financial literacy significantly influences firm valuation and profitability, though its impact varies depending on the fixed effects applied. Across different models, the findings reveal a consistent negative relationship between financial literacy and firm overvaluation, indicating that higher financial literacy levels lead to more conservative and realistic firm valuations. This effect is particularly pronounced in models incorporating industry, state, and temporal fixed effects, reinforcing that financial literacy acts as a stabilizing force against speculative pricing and overinflated market expectations. The robustness of findings across observed and imputed financial literacy data in Panels A and B underscores the reliability of the results. Table 4 reports the baseline results analysis.

[Table 4]

Additional analysis

Sub-period analysis with Industry Fixed effect

Table 5 presents the sub-period analysis incorporating Industry Fixed effect results, providing insights into how the relationship between financial literacy and firm performance has evolved over time. The analysis is divided into two panels. Panel A observed financial literacy data from NFCS, and Panel B incorporates imputed financial literacy data using Fully Conditional Specification (FCS). Both panels evaluate the impact of financial literacy on firm valuation metrics and profitability metrics across five sub-periods: 2009, 2012, 2015, 2018, and 2021.

Within Panel A, *Market_Cap* positivity in 2009 showed a strong positive impact of financial literacy on market capitalization during the economic recovery phase following the global financial crisis as informed investors drove market recovery. However, this effect turns

negative in 2012 and 2015, as financial literacy led to corrected market overvaluation during a period of economic stabilization and growth as financial literacy may have curbed speculative bubbles, leading to lower market valuations. By 2018, a return to positivity during a period of strong economic performance and confidence as financial literacy supported better-informed investment. However, it was neutral in 2021 due to potentially induced volatility from the pandemic.

Tobin_Q showed that financial literacy had a strong positive impact in 2009, with high valuation efficiency during the early recovery period with efficient allocation of resources. This turned negative in 2012 and 2018, influencing the reassessment of firm value relative to its assets as they discourage overvaluation and speculation. In contrast, it remained neutral in 2015 and 2021, indicating minimal impact during these periods with political uncertainty and pandemic effects playing a role. For profitability measures, *ROA* showed positivity in 2009, 2012, and 2018, indicating financial literacy's consistent impact on operational efficiency with the likelihood of contributing to better asset utilization and operational efficiency during stages of economic recovery and stability. Yet, it was neutral in 2015, with firms maintaining efficiency, leaving room for fewer improvements. By 2021, *ROA* turned negative reflecting pandemic-induced operational challenges.

ROE results were mixed, presenting positive but insignificant returns in 2009 and 2015 and negative in 2012 and 2018, indicating financial literacy's role in restraining equity-driven risk-taking marked by a more cautious approach. In 2021, neutrality returned likely due to the pandemic. *EBIT*, meanwhile, demonstrated neutrality in 2009 as financial literacy had little to no impact on profitability during the immediate recovery phase. It turned negative in 2012, 2018, and 2021, reflecting the tightening of operational margins from market corrections, external shocks,

and the increase of scrutiny of management efficiency to prevent another financial crisis. The lone exception is 2015 with a positive impact reflecting operational improvements during times of economic growth.

Within Panel B, *Market_Cap* at negative coefficient in earlier years between 2009 to 2015 reflects how financial literacy exposed inefficiencies and overvaluations that led to the crisis, leading to an increase in transparency and accountability. The positive coefficients in the later years of 2018 to 2021 reflect a shift where literacy nurtures confidence and improves market participation, especially in recovery time from the pandemic. *Tobin_Q* alternated between insignificance to negative and significant. In 2009, the insignificant coefficient demonstrated minimal influence on market efficacy during the financial crisis. In 2012, negative and significant inefficiency in resource allocation led to a decline in *Tobin_Q*. By 2015, the results became an insignificant and stabilized influence on firm efficiency from post-crisis market adjustment. The significant negative coefficient in 2018 showed the challenges of accomplishing preferred market resource allocations, while the results of 2021 showed insignificant results from the pandemic's possible disruptive influence.

ROA started with a negative impact in 2009 highlighting crisis-driven inefficiencies but with an increase in positive influence over time demonstrating literacy's role in improving operational efficiency and management quality with the only insignificant results from 2015 on. *ROE* remains consistently insignificant throughout all the days demonstrating limited impact on equity performance, possibly due to external factors like market volatility and capital structure variations. *EBIT* has a negative impact in earlier years reflecting crisis-driven inefficiencies, while the positive coefficients in later years indicate improved operational performance driven by better management practices and decision-making.

Overall, the sub-period analysis with Industry Fixed effects indicates that financial literacy has a dynamic impact on firm performance metrics, with its influence evolving over time. The earlier years (2009–2015) highlight financial literacy's role in correcting market inefficiencies and overvaluation, while the later years (2018–2021) demonstrate its positive role in enhancing market confidence, operational efficiency, and firm valuation. Additionally, Panel B results suggest that *I_Fin_Lit* enhances robustness by mitigating missing data issues or providing more consistent findings, confirming that financial literacy has a measurable impact on firm performance. Furthermore, these findings suggest that while financial literacy plays a critical role in shaping firm performance, its effects are highly dependent on macroeconomic conditions, external shocks (e.g., financial crisis, pandemic), and investor sentiment over time. As such, future research should explore how financial literacy interacts with market volatility, investor risk appetite, and broader financial stability indicators to refine its role in corporate finance further. Table 5 reports the sub-year analysis with industry fixed effect.

[Table 5]

Sub-industry analysis with Year Fixed effect

Table 6 presents the sub-industry analysis incorporating Year Fixed effect, providing insights into the role of financial literacy in shaping firm valuation and profitability metrics across various industries. The analysis is divided into two panels. Panel A uses observed financial literacy data from NFCS, while Panel B incorporates imputed financial literacy data using Fully Conditional Specification (FCS). Both panels evaluate the impact of financial literacy on valuation metrics and profitability metrics across industries, including Agriculture, Mining, Construction, Manufacturing, Transporting, Wholesale Trade, Retail Trade, Finance, Service, and Public Administration. By including year fixed effects, the analysis ensures that results are not driven by

macroeconomic fluctuations, policy changes, or external economic shocks such as financial crises or regulatory adjustments. This allows for a cleaner estimation of how financial literacy affects firm performance within each industry over time.

Market_Cap demonstrated a multitude of variations in results. Beginning with the significantly negative coefficient of the Construction, Transporting, and Service industries illuminated that financial literacy corrects overvaluations in these spaces, reflecting improved transparency and discouraging speculative behavior. Construction projects often require high levels of leverage and long-term commitments, which make firms more vulnerable to scrutiny by financially literate investors. Transporting deals with fluctuating costs like fuel prices and capital expenditure on fleets. Therefore, financial literacy drives investors to focus on operational efficiency, route optimization, and cost control, which can reduce speculative elements in valuations and provide a more realistic market assessment. Financially literate investors in the Service industry know that valuations in this sector rely heavily on intangible assets and goodwill such as customer retention, service quality, and efficiency of resource utilization, rather than over-optimistic growth projections or speculative expectations. This helps curb speculative valuations and realign market values to more conservative valuations.

Market_Cap's significant positive coefficient with Mining and Retail Trade suggests that financial literacy may contribute to more informed valuation assessments in these industries. Mining operations involve significant capital expenditure and long-term projects that carry inherent risks. Financial literacy empowers investors and stakeholders to evaluate these risks better, such as the value of mineral reserves and understanding operational efficiency. This reflects positively on the firm's market capitalization and helps align market perceptions with resource valuation and sustainability practices, which are crucial in the mining sector. Retail Trade faces

dynamic challenges such as fluctuating demand, pricing strategies, and inventory management. Financial Literacy helps investors prioritize firms that are effective in their supply chain management, cost efficiency, and customer retention strategies. This leads to increased market valuations as they boast strong fundamentals and adaptive capabilities in an ever-changing and competitive environment.

Market_Cap's insignificant results are with Agriculture, Manufacturing, Wholesale Trade, Finance, and Public Administration. The lack of statistical significance across these industries highlights that the impact of financial literacy is contingent upon the sector's unique characteristics. External and operational factors seem to dominate market valuation for Agriculture, Manufacturing, and Wholesale Trade. Whereas for Finance and Public Administration, regulatory and structural influences play a larger role, limiting the measurable effect of financial literacy on market capitalization.

Tobin_Q has a significantly negative coefficient within the Construction, Manufacturing, Transporting, and Service industries. Construction relies heavily on capital. Individuals with higher financial literacy would scrutinize inefficiencies, overvaluations, and debt structures more critically. This would force a shift in operations to align more with tangible fundamentals in response to the industry's exposure to economic cycles and speculative practices. In manufacturing, production cost and efficiency metrics rely on firm performance. Financial literacy would lead investors to focus on sustainable growth and operational efficiency, resulting in moderated market expectations.

With Transporting, financial literacy would force investors to focus on logistical efficiency and operational sustainability rather than speculative growth. Transporting firms would have to reduce overvaluation as they are prone to such behavior. Investors would demand stability. In

Service, intellectual property can be difficult to quantify, often leading to inflated expectations. However, financial literacy will make investors question the sustainability of high valuations if they observe declining profit margins or increased competition in the industry. This will also drive firms to provide more transparent disclosures about intangible asset valuations, further reducing speculative distortions. *Tobin_Q*'s insignificant coefficient variables are Agriculture, Mining, Wholesale Trade, Retail Trade, Finance, and Public Administration. Financial literacy has a limited role in influencing *Tobin_Q* in these sectors. These industries are driven by macroeconomics and non-market forces that overshadow the effects of financial literacy.

ROA's significant positive coefficients are Manufacturing, Finance, Service, and Public Administration. With *ROA* focusing on profits relative to its total assets, financial literacy encourages investors to prioritize asset utilization to ensure that capital investment yields higher returns in Manufacturing. For Finance, financial literacy plays a role in optimizing financial institutions' operational frameworks, with stakeholders demanding stricter risk management and better allocation of capital to profitable investments. This sector's operational efficiency depends on managing intangible financial instruments; financial literacy ensures better oversight of assets like loan portfolios and investment securities. In Service, profitability is closely tied to intangible assets like brand equity and customer satisfaction. Financial literacy will demand better decision-making and strategic investment to enhance profitability, especially with improved workforce management and customer-focused investments likely to contribute to higher asset returns. Lastly, financial literacy implications in Public Administration are fostering investments in technology, infrastructure, and public services which yield better returns due to heightened scrutiny from financially literate stakeholders.

ROA's insignificant coefficients are Agriculture, Mining, Construction, Transporting, Wholesale Trade, and Retail Trade. This suggests financial literacy's impact is limited due to factors such as operational improvements that may depend more on technological advancements than on financial literacy. Long lead times and high fixed costs diminishes the influence of financial decision-making on asset returns or inefficiencies due to its cyclical nature and dependence on economic growth.

ROE's only significantly positive coefficient is Service. These results highlight how financial literacy influences equity-driven decision-making, risk management, and profitability. Financial literacy provides managers and investors the means to analyze equity-related decisions critically by allowing businesses to improve the cost of capital, manage equity risks effectively, and align equity investments with long-term strategic objectives. This is vital in the service industry where its financial performance depends on leveraging human capital and customer relationships rather than physical assets.

ROE's insignificant coefficients are Agriculture, Mining, Construction, Manufacturing, Transporting, Wholesale Trade, Retail Trade, Finance, and Public Administration. There are various degrees of reasoning for the limited influence on these sectors, but the implications could be the need for technological advancements, external market factors' domination on equity returns, and sectoral reforms, to name a few, to make an impact on *ROE*.

EBIT's significant negative coefficient is Finance. Financial literacy improves risk management and decision-making, and it leads to scrutiny of operational inefficiencies. This will lead to the compression of margins as financial literacy discourages excessive risk-taking and speculative practices, leading to a contraction in core profitability. The promotion of adhering to regulations would increase compliance costs and reduce operational profitability. A shift towards

sustainable practices, while beneficial in the long run, may result in short-term costs that reduce *EBIT*.

EBIT's significant positives are Transporting, Retail Trade, and Service. Financial literacy's impact on Transporting allows for streamlined operations, which reduces unnecessary expenses and improves profit margins, leading to better investment in modern technologies, improving operational performance. On Retail Trade, optimization of supply chains and price adjustment to maximize profits leads to better inventory turnover and reduction in cost with overstocking. In Service, better resource allocation is done with revenue-generating activities, leading to profitability.

EBIT is statistically insignificant across these sectors: Agriculture, Mining, Manufacturing, Wholesale Trade, and Public Administration suggesting that factors such as weather, crop yields, global commodity prices, high reliance on natural resource extraction and global market prices for commodities, fixed costs, thin profit margins and heavy regulations have a limited financial literacy impact.

With Panel B, *Market_Cap*'s significant negatives are Construction, Manufacturing, Transporting, Wholesale Trade, Retail Trade, Finance, Service, and Public Administration. About 80% of the *Market_Cap* results fell in the negative squadron, further confirming that financial literacy curbs speculative overvaluation across multiple industries. The negative impact on Construction implied that financial literacy likely discourages excessive optimism, aligning valuations with realistic profitability and operational efficiency. Manufacturing results meant that investors and managers were ensured of valuations aligned with firm fundamentals, which reduced speculative excesses as they relied heavily on tangible assets and efficiency metrics. Transporting results indicated that there is a curve in overvaluation tendencies because of improved transparency

and accountability, especially in a sector that deals with fuel costs, logistics efficiency, and external economic factors.

Wholesale Trade operates on thin margins. Therefore, financial literacy provides accurate valuation adjustment to reflect operational authenticity. Retail Trade is characterized by dynamic inventory management, fluctuating demand patterns, and tight operating margins. Financial literacy supports more rational valuation approaches, which supports better employment practices to reduce turnovers and be more resilient to economic shocks. In the Finance industry, exposures of inefficiencies discourage bubbles and help demonstrate actual risk and returns. Service is often inflated due to intangible assets, but financial literacy reduces these valuations as investors seek concrete operational performance metrics. Public Administration, though less market-driven, must improve their budget transparency and efficiency expectations from demands by financially literate investors.

Market_Cap's statistically significant positive is Mining, indicating the impact of financial literacy supports better assessments of resource potential and long-term profitability, leading to more favorable valuations in a sector reliant on natural resource extraction. *Market_Cap*'s insignificant results, Agriculture, suggest that financial literacy has limited effects as other dynamics play a stronger role, such as global commodity prices.

Tobin_Q's significant negative results are Mining, Manufacturing, Transporting, and Service. Since Mining is a capital-intensive sector influenced by commodity price cycles, financial literacy discourages speculative valuation, which aligns valuations with tangible metrics rather than market speculation. The manufacturing industry relies on capital and operational efficiencies, and financial literacy ensures valuations reflect actual productivity and cost structures rather than inflated expectations. The transportation industry illustrates that financial literacy aids in

decreasing overvaluations by accentuating operational stability and efficiency since they are sensitive to fuel costs, infrastructure investments, and regulatory changes. Last in the negative significant pool for *Tobin_Q* is Service, which shows that financial literacy makes investors focus on goodwill and reputation, which are tied to the fundamental earnings potential. *Tobin_Q*'s insignificant results are Agriculture, Construction, Wholesale Trade, Retail Trade, Finance, and Public Administration. This shows that these industries are subjugated to external factors and structural complexities like agriculture, finance, and construction. This brings forth the importance of having financial literacy that is sector-specific for adjustments.

ROA's significant positive results are Mining, Manufacturing, Transporting, Finance, Service, and Public Administration. Mining's results show that financial literacy helps deal with price volatility and environmental regulations as they improve resource allocation and cost management. Manufacturing demonstrates the impact of financial literacy by forcing firms to optimize supply chains, manage inventory, streamline operations, and eventually improve profit margins. Transporting, through enhanced literacy, displays cost optimization and resource efficiency through better management of fuel expenditures, route planning, and logistics. Finance-enhanced literacy exhibits refined decision-making processes as they benefit through risk assessment, interest rate management, and strategic investment decisions, directly contributing to increased profitability. For Service, financial literacy helps equip firms with the tools to manage costs and align operations with market demand. Public Administration underlines how financial literacy impacts *ROA* by promoting effective budget planning, transparent allocation, and operational efficiency. Financial literacy ensures better utilization of limited public resources, resulting in enhanced service delivery and socioeconomic benefits. *ROA*'s insignificant results are Agriculture, Construction, Wholesale Trade, and Retail Trade. This shows these sectors' reliance

on cyclical demand, project-based revenues, distribution logistics, and inventory turnovers that would dilute the effects of financial management practices

ROE's insignificance is across all industries, suggesting that financial literacy has an inconsistent influence on equity performances. This can be attributed to various factors such as government subsidies, geopolitical factors, material costs, competitive dynamics, regulatory changes, and pricing power. This is poignant as it illustrates consistency between both Panel A and B for *ROE*.

EBIT's significant negatives coefficients are Agriculture, Mining, Finance, and Public Administration. Though financial literacy impacts Agriculture, structural issues such as price volatility, reliance on subsidies, and weather dependency hinder its ability to improve profitability, resulting in reduced *EBIT*. For Mining, the sector's high fixed costs and exposure to commodity price fluctuations adversely impact *EBIT*, even with better resource allocation provided by financial literacy. In Finance, there are profitability constraints due to regulator pressures, interest rate environment, and customer empowerment that cannot be mitigated by financial literacy, negatively affecting *EBIT*. While Public Administration tends to focus more on public service over profit, even with financial literacy's impact on improving efficiency in budgeting and resource management, it can't reduce the constraints.

EBIT's significant positive coefficients consist of Retail Trade and Service. Retail Trade's positive influence can be attributed to consumer awareness with fair pricing and value-driven purchasing decisions, efficient resource allocation, and e-commerce expansion such as digital sales strategies, logistics, and cost management which leads to higher *EBIT*. Service financial literacy influence translates into a focus on cost efficiencies, revenue diversification, technology integration, and adaptability to market changes. *EBIT*'s insignificant coefficients are Construction,

Manufacturing, Transporting, and Wholesale Trade. While these results are highlighted, there are industry characteristics that render the variables less influential. There are matters such as market maturity, standardized decisions, and global commodity that lessen the impact of financial literacy.

Overall, both panels indicate that financial literacy plays a dual role in inducing firm performance. Regarding valuation metrics, it plays as a corrective mechanism that aligns speculative valuations with fundamental performance. While for profitability metrics, it promotes optimal efficiency and resource optimization. The nuanced sectoral results show that financial literacy has a profound effect on resource-intensive and customer-driven sectors, while standardized industries have a lesser role, highlighting the importance of tailored interventions for fundamental progress. Thus, Table 9 confirms that financial literacy plays an evolving role in shaping firm valuation and profitability, influenced by industry-specific factors and macroeconomic conditions. Table 6 reports the sub-industry with Year Fixed effect analysis.

[Table 6]

Robustness tests: Baseline results of Fin_Lit and I_Fin_Lit on firm performance metrics with Firm Fixed effect

Table 7 provides the results of various robustness tests to strengthen the main findings of the study. The table is divided into four panels, each employing a different fixed effect structure. Firm Fixed effect in Panels A and B. Additionally, Panels B incorporate FCS imputation to address potential biases from missing data. These robustness tests aim to validate the consistency of the results across different methodological approaches and data structures.

There is consistency across panels as the negative impact of financial literacy on *Market_Cap* and *Tobin_Q* demonstrates its role in dispiriting speculative behavior and aligning valuations with firm fundamentals. Within the profitability metrics, *ROA* shows financial literacy

steadily augments asset utilization and improves operational efficiency. Nevertheless, *ROE* largely remains immune, which indicates that capital structure and market volatility govern equity-based outcomes. While *EBIT* had a multitude of results between positive and negative sway, the overall trend emphasizes that financial literacy nurtures long-term operational sustainability at the cost of short-term profit compression. Adding Firm Fixed effects, and FCS imputations provided a robust outlook to the various modeling approaches, allowing for financial literacy characteristics influences to shine through. Table 7 reports the results with various degrees of fixed effects.

[Table 7]

Connection to Existing Literature

The findings align with prior studies that emphasize the role of financial literacy in enhancing firm transparency and reducing speculative valuation (Lusardi & Mitchell, 2014; van Rooij, Lusardi, & Alessie, 2011). The negative relationship between financial literacy and *Market_Cap* is consistent with DeBondt and Thaler's (1985) assertion that investor overconfidence can lead to overvaluation, which financial literacy mitigates. Similarly, the negative association between financial literacy and *Tobin_Q* echoes findings from Lang and Stulz (1994), who argue that firms in well-informed environments exhibit more rational market valuations.

Furthermore, the study's positive correlation between financial literacy and *EBIT* aligns with research by Lusardi and Tufano (2015), which highlights how financial literacy contributes to cost efficiency and long-term profitability by fostering informed financial decision-making and risk management. However, the insignificant relationship between financial literacy and *ROE* contrasts with research such as Al-Matari, Al-Swidi, and Fadzil (2014), which suggests that firm profitability metrics such as *ROE* may be influenced by additional external factors, including

corporate governance structures and leverage decisions. Their study highlights that *ROE* is not solely driven by operational efficiency but is also affected by corporate governance mechanisms such as board composition, executive oversight, and ownership structures. Additionally, leverage decisions, which determine a firm's financial risk exposure, play a critical role in shaping *ROE* outcomes. Firms with higher leverage may experience increased returns on equity if debt financing is efficiently utilized; however, excessive leverage can also introduce financial distress, thereby reducing *ROE*. These insights suggest that while financial literacy contributes to operational efficiency and prudent financial decision-making, its direct impact on shareholder returns may be moderated by broader governance and financial structuring decisions.

V. Discussion

Summary of Key Findings

This study explores the relationship between financial literacy and firm performance, particularly focusing on firm valuation and profitability metrics. The findings indicate that financial literacy is negatively associated with *Market_Cap* and *Tobin_Q*, suggesting that financially literate firms tend to be more conservatively valued, reducing overvaluation and speculative pricing. Conversely, financial literacy is positively correlated with *ROA*, highlighting improved asset utilization and operational efficiency among firms in financially literate environments. The study finds no significant relationship between financial literacy and *ROE*, suggesting that while financial literacy enhances operational efficiency, it does not necessarily translate into higher shareholder returns. Additionally, *EBIT* demonstrates mixed results, suggesting that financial literacy enhances profitability through strategic decision-making and cost efficiency, but its effects may take time to materialize. Firms in financially literate environments

may prioritize reinvestment in productivity-enhancing assets, workforce training, and long-term financial sustainability over short-term profit maximization.

Interpretation of Results

The findings underscore the multifaceted role of financial literacy in firm performance. The negative correlation with *Market_Cap* suggests that financially literate firms are less likely to be overvalued, likely due to more cautious investment behaviors and enhanced transparency. This finding supports the idea that financial literacy acts as a corrective mechanism, reducing information asymmetry and aligning market valuations with fundamental firm performance.

The negative relationship with *Tobin_Q* further highlights financial literacy's role in shaping investor expectations. Firms in financially literate environments are subject to greater scrutiny, leading to more conservative valuations. This reinforces the importance of financial literacy in mitigating speculative pricing and fostering a more stable investment climate.

The positive effect on *ROA* suggests that financially literate firms allocate resources more efficiently, leading to better asset utilization and cost management. This finding implies that financial literacy contributes to strategic decision-making, enabling firms to optimize operational performance and enhance long-term profitability. However, the insignificant relationship with *ROE* indicates that shareholder returns are influenced by factors beyond financial literacy, such as market volatility, corporate governance structures, and financing strategies.

Strengths and Contributions

This study makes several contributions to the literature on financial literacy and firm performance. Unlike prior research that primarily focuses on individual financial literacy outcomes, this study extends the analysis to corporate financial performance by integrating state-level financial literacy data with firm-level valuation and profitability metrics. The use of

imputation methods such as FCS further strengthens the robustness of the findings by addressing missing data concerns (Buuren, 2018; Rubin, 1987; Schafer, 1997). Additionally, the study incorporates multiple fixed-effect specifications—including industry, state, and year—to control for external influences, ensuring a more comprehensive analysis of financial literacy’s impact on firm performance. These findings highlight the importance of financial literacy not just in reducing speculative pricing, but also in fostering long-term corporate sustainability and financial discipline, reinforcing its role as a stabilizing factor in firm valuation and operational efficiency.

VI. Conclusion

From the beginning, this study set to explore the inner workings of financial literacy and firm performance by examining the valuation and profitability metrics across diverse industries. NFCS and COMPUSTAT made up a unique dataset that used FCS imputations to demonstrate the pervasive influence of financial literacy on firm metrics. The findings provided empirical evidence that financial literacy encourages better-informed decision-making, operational efficacy, and more faithful market valuations at the firm level. Regions with high financial literacy showed improved investor confidence and resource allocation. This highlighted the importance of sector-specific approaches and showed the importance of financial literacy as a vehicle to moderate speculative behavior and promote firm stability.

Economic Significance of the Findings

In addition to statistical significance, this study highlights the economic relevance of financial literacy’s effects using one of the most robust specification models with Fully Conditional Specification (FCS) and state-year fixed effects. These results reveal that financial literacy significantly influences firm performance across valuation and profitability metrics. For example, a 1-point increase in state-level financial literacy translates to an estimated \$64.31

million reduction in market capitalization, demonstrating that financially literate environments promote valuation discipline by reducing speculative pricing. Similarly, for Tobin's Q, the same 1-point increase corresponds to an approximate \$4.47 billion reduction in implied firm valuation based on average firm asset values, reinforcing that financial literacy aligns firm valuation more closely with economic fundamentals. On the profitability side, the effect on *ROA* is economically meaningful, with a 1-point increase in financial literacy associated with an estimated \$2.78 million increase in net operating income, signifying improved asset utilization and operational efficiency. In contrast, *ROE* remains statistically and economically insignificant, with a minor estimated decrease of about \$228,000 in shareholder income, suggesting that equity returns are more influenced by broader capital market conditions than by financial literacy alone. Lastly, *EBIT* shows minimal economic impact, with only a \$23,200 decline per point of financial literacy, highlighting that industry-specific costs and structural factors may play a more dominant role in determining core profitability than informational environments. Altogether, these findings not only confirm the robustness of financial literacy's impact but also translate the results into real dollar terms—affirming the tangible, firm-level value of investing in financial education and governance literacy initiatives.

Limitations

Despite its contributions, this study has several limitations. First, while the financial literacy index provides a valuable measure, it may not capture all dimensions of financial literacy, such as behavioral biases or individual financial decision-making capabilities. Second, although fixed effects are incorporated, unobserved firm-specific characteristics that influence financial performance may still lead to omitted variable bias. Third, this study focuses on publicly traded firms, limiting the generalizability of the findings to privately held businesses or small enterprises,

where financial literacy may play a different role. Fourth, the dependence on state-level variations does not fully capture the individual as well as the regional variations in the data, which brings forth potential limitations of the granularity of the analysis. Fifth, the imputation technique applied in this study, which allowed for robustness, does, at its core, involve some assumptions that could potentially introduce bias. Lastly, the reliance on secondary data may introduce measurement errors, particularly in the construction of financial literacy indices.

Future Research Directions

Future research could expand upon this study by incorporating additional dimensions of financial literacy, such as behavioral finance aspects, to better understand how cognitive biases influence corporate financial decision-making. Further investigation could also explore the impact of financial literacy on firm performance in privately held businesses or SMEs, where access to external financial resources is more constrained. Additionally, longitudinal studies could assess how changes in financial literacy levels over time affect firm performance, providing deeper insights into causal relationships. Future research could also integrate survey-based measures of financial literacy to complement existing financial literacy indices, ensuring a more comprehensive evaluation of its role in corporate financial management. Future studies could incorporate more localized financial literacy measures as well as longitudinal data to examine temporal effects. Exploring alternative imputation methods could help validate findings with the introduction of additional datasets to improve the study's robustness.

Furthermore, given the mixed results regarding the impact of financial literacy on *EBIT* and *ROE*, future studies could explore whether specific industries or firm characteristics moderate these relationships. Analyzing sector-specific variations in financial literacy effects could provide

valuable insights into which industries benefit most from enhanced financial literacy and how firms can tailor financial education programs to maximize corporate success.

In summary, this study provides strong empirical evidence that financial literacy significantly influences firm performance, with particular effects on firm valuation and operational efficiency. By addressing key gaps in the literature and employing robust econometric techniques, this study provides new insights into how financial literacy influences corporate decision-making, investor behavior, and firm valuation, offering a more comprehensive understanding of its role in shaping financial outcomes. Its findings underscore the necessity of integrating financial education initiatives into corporate governance frameworks to enhance firm performance and investor confidence. However, further studies are needed to explore additional variables and mechanisms through which financial literacy affects firm outcomes, ultimately paving the way for more effective financial education initiatives and corporate policies.

Policymakers and educators can use this study to offer targeted financial literacy programs to amplify their impact. For example, resource-heavy industries may benefit from risk management training. Service and retail sectors could leverage financial literacy to improve customer engagement and profitability, and standardized industries might integrate technological advancements alongside financial education to maximize efficiency and competitiveness. The existing literature largely focuses on individual financial literacy outcomes, leaving an underexplored area concerning its impact at the corporate level. Future research should examine sectoral variations in financial literacy effects, particularly in industries with varying levels of capital intensity and investor sophistication. Future research should explore the effects of sectoral variation and longitudinal effects to build on the foundation established by this study and foundational work. In the end, this research serves as an abridge between macro-level education

initiatives and micro-level corporate outcomes. Financial literacy is not just a financial tool but a strategic asset that acts as a catalyst for sustainable economic growth. Future research should continue exploring the dynamic pathways between financial literacy and firm outcomes, offering deeper insights into how financial education initiatives can enhance corporate resilience, drive innovation, and shape a more stable and efficient market environment.

Data availability: The data used in this will be available upon request.

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Appendix A

A Detailed List of the Dependent and Explanatory variables

Dependent variables	Explanation	Data source
<i>Market_Cap</i>	(1) Natural log of market capitalization	COMPUSTAT
<i>ROA</i>	(2) Return on Assets with Income Before Extraordinary Items (IB / AT)	COMPUSTAT
<i>ROE</i>	(3) Return on Equity with Income Before Extraordinary Items (IB / TEQ)	COMPUSTAT
<i>EBIT</i>	(4) Log of Earnings Before Interest and Taxes, calculated only for positive EBIT values	COMPUSTAT
<i>Tobin_Q</i>	(5) Market value plus Total Long-Term Debt divided by Total Assets ((MKVALT + DLTT) / AT)	COMPUSTAT
Explanatory variables	Expected sign and Explanation	Data source
<u><i>Literacy variable</i></u>		
<i>Fin_Lit</i>	+ State-level Financial Literacy Index per year, average of financial literacy scores	NFCS
<i>I_Fin_Lit</i>	+ Imputed Financial Literacy Index (when data is missing), based on FLI	NFCS
<u><i>Target-specific controls</i></u>		
<i>Firm_Size</i>	+ Natural logarithm of total assets	COMPUSTAT
<i>Leverage</i>	- Leverage ratio, calculated by total liabilities divided by total assets	COMPUSTAT
<i>Cash_Holding</i>	+ Cash holding ratio, calculated as Cash (CH) / Total Assets (AT)	COMPUSTAT
<i>Book_to_Market</i>	- Book-to-Market Ratio, calculated as Total Equity (TEQ) / Market Value (MKVALT)	COMPUSTAT
<i>Stock_Return</i>	+ Log of Stock Return (Price Close), calculated as log(PRCC_F + 1)	COMPUSTAT
<i>Sales_Growth</i>	+ Log of Sales Growth, calculated as log(Total Revenue REVT + 1)	COMPUSTAT
<u><i>Other control</i></u>		
<i>Industry Dummies</i>		

Table 1

Industry Distribution of Sample Deals

Panel A: Distribution of the Sample by Industry				
Industry	Two Digit SIC	Frequency	% of Sample	Cumulative %
Agriculture, forestry, and fisheries	01-09	352	0.35%	0.35%
Mining	10-14	15,631	15.61%	15.61%
Construction	15-17	877	0.88%	16.84%
Manufacturing	20-39	34,572	34.53%	51.37%
Transportation, communication, and utility	40-49	6,987	6.98%	58.35%
Wholesale trade and retail trade	50-59	6,638	6.63%	64.98%
Finance, insurance, and real estate	60-67	18,680	18.66%	83.64%
Services	70-89	14,874	14.86%	98.5%
Public Administration	90+	1,515	1.51%	100.00%
Total		100,126	100%	

Panel B: Distribution of the Sample by Year

Year	Frequency
2009	6,787
2010	6,893
2011	6,794
2012	7,112
2013	7,197
2014	7,214
2015	6,988
2016	6,624
2017	6,499
2018	6,365
2019	6,161
2020	6,060
2021	6,514
2022	6,472
2023	6,336
2024	125
Total	100,141

Table 2
Descriptive Statistics

Panel A: Descriptive Statistics

Dependent Variables									
	N ¹	Mean	Std. Dev	Skewness	Mini	Q1	Median	Q3	Max
<i>Market_Cap</i>	100126	5.411	2.525	0.101	0.352	3.496	5.370	7.285	11.226
<i>ROA</i>	100126	-0.750	3.366	-6.120	-24.567	-0.199	0.002	0.043	0.378
<i>ROE</i>	100126	-0.383	1.778	0.512	-8.872	-0.165	0.046	0.146	9.857
<i>EBIT</i>	100126	2.461	2.558	0.684	0.151	0.151	1.606	4.549	9.230
<i>TOBIN_Q</i>	100126	5.649	24.67	7.443	0.069	0.623	1.108	2.253	215.83
Explanatory Variables									
<i>Fin_Lit</i>	24040	2.821	0.226	0.092	2.219	2.656	2.816	3.008	3.419
<i>I_Fin_Lit</i>	100126	2.824	0.224	0.034	1.952	2.666	2.820	2.979	3.837
<i>Firm_Size</i>	100126	5.552	2.759	-0.149	0.008	3.539	5.791	7.574	11.511
<i>Leverage</i>	100126	0.185	0.259	2.307	0	0	0.073	0.295	1.500
<i>Cash_Holding</i>	100126	0.176	0.232	1.891	0	0.020	0.079	0.225	0.978
<i>Book_to_Market</i>	100126	0.593	1.385	-1.278	0	0.182	0.07	0.225	0.978
<i>Stock_Return</i>	100126	2.165	1.484	0.144	0.005	0.765	2.250	3.328	5.575
<i>Sales_Growth</i>	100126	4.424	3.014	-0.029	0	1.836	4.651	6.764	10.716

¹ The number of observations includes a joint sample from NFCS survey data from FINRA from 2009-2021 and WRDS database from 2009-2024.

Table 3
Correlation Matrix & Variance Inflation Factor (VIF)

Table 3 presents the correlation matrix and VIF in two panels. Panel A shows the correlation matrix. ***, **, * Indicates statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on a two-tailed test. Panel B shows the VIF results demonstrating the level of multicollinearity among variables. Dependent and financial variables are winsorized at the 1% and 99% levels.

Panel A: Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	
Fin_Lit	1										
I_Fin_Lit	2	1***									
Market_Cap	3	0.158***	-0.159***	1							
ROA	4	0.016***	-0.023***	0.284***	1						
ROE	5	0.797*	-0.009***	0.035***	-0.145***	1					
EBIT	6	0.760***	-0.107***	0.773**	0.214***	0.088***	1				
Tobin_Q	7	-0.048	0.001	-0.132***	-0.556***	0.103***	-0.153***	1			
Firm_Size	8	-0.118***	-0.124***	0.869***	0.402***	0.021***	0.798***	-0.322***	1		
Leverage	9	0.130***	0.083***	0.179**	-0.011***	0.068***	0.211***	0.025***	0.194***	1	
Cash_Holding	10	0.166***	-0.009***	-0.210***	-0.153***	-0.069***	-0.339***	0.217***	-0.403***	-0.162***	1
Book_to_Market	11	0.023***	0.020***	0.025***	0.277**	-0.082***	0.031***	-0.144***	0.197***	-0.192***	-0.136***
Stock_Return	12	-0.146***	-0.131***	0.837***	0.280***	0.054***	0.730***	-0.164***	0.777***	0.112***	-0.239***
Sales_Growth	13	-0.042***	-0.108***	0.807***	0.313***	0.057***	0.817***	-0.239***	0.869***	0.254***	-0.388***
	11	12	13								
Book_to_Market	11	1									
Stock_Return	12	0.022***	1								
Sales_Growth	13	0.079***	0.738***	1							

Panel B: Variance Inflation Factor

<i>Variables:</i>	<i>VIF Valuation Measurement</i>		<i>VIF Profitability Measurement</i>		
	<i>Market_Cap</i>	<i>Tobin_Q</i>	<i>ROA</i>	<i>ROE</i>	<i>EBIT</i>
<i>Fin_Lit</i>	1.05608	1.05608	1.05608	1.05608	1.05608
<i>I_Fin_Lit</i>	1.02604	1.02604	1.02604	1.02604	1.02604
<i>Firm_Size</i>	5.63469	5.63469	5.63469	5.63469	5.63469
<i>Leverage</i>	1.16114	1.16114	1.16114	1.16114	1.16114
<i>Cash_Holding</i>	1.24366	1.24366	1.24366	1.24366	1.24366
<i>Book_to_Market</i>	1.18958	1.18958	1.18958	1.18958	1.18958
<i>Stock_Return</i>	2.83454	2.83454	2.83454	2.83454	2.83454
<i>Sales_Growth</i>	4.55448	4.55448	4.55448	4.55448	4.55448

Table 4

Baseline Results with various Fixed Effect

Table 4 presents the baseline results. Panel A shows the impact of each explanatory variable on the dependent variables with No Fixed effect, Industry Fixed effect, Year Fixed effect and Industry-Year Fixed effect. The sample consists of the role of financial literacy surveys and firms' valuation and profitability performance using NFCS and COMPUSTAT data. The sample consists of 23973 observations from 2009 to 2024. Panel B shows the impact of Fully Conditional Specification (FCS), a Stochastic Regression Imputation of each explanatory variable on the dependent variables while incorporating No Fixed effect, Industry Fixed effect, Year Fixed effect and Industry-Year Fixed effect. The sample consist of the role of financial literacy surveys and firms' valuation and profitability performance using NFCS and COMPUSTAT databased. The sample consists of 100126 observations from 2009 to 2024. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, based on a two-tailed test. The t-statistics appear in the parentheses. Variables are defined in the Appendix. All continuous variables are winsorized at the 1% and 99% levels.

Panel A: Impact of Explanatory Variables on Firm Valuation and Profitability Metrics with No Fixed effect, Industry Fixed effect, Industry-Year Fixed effect, State Fixed effect, State-Industry Fixed effect, and State-Year Fixed Effect

Variables Experimental Variables	No Fixed Effect					Industry Fixed Effect					Year Fixed Effect				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>Fin_Lit</i>	-0.336*** (-11.68)	-1.725*** (-2.6)	0.368*** (4.11)	0.068 (1.38)	0.174*** (4.3)	-0.283*** (-10.7)	-2.038** (-3.09)	0.412*** (4.63)	0.047 (0.96)	-0.110*** (-2.76)	-0.0162 (-0.34)	-2.299** (-2.08)	0.486*** (3.26)	-0.0414 (-0.50)	-0.126* (-1.89)
<i>Firm_Size</i>	0.440*** (80.55)	-4.316*** (34.25)	0.494*** (29.06)	-0.109*** (-11.54)	0.273*** (35.53)	0.590*** (102.4)	-5.306*** (-36.94)	0.604*** (31.19)	-0.160*** (-14.75)	0.174*** (20.06)	0.437*** (79.88)	-4.278 (-33.85)	0.490*** (28.74)	-0.107*** (-11.29)	0.282*** (36.90)
<i>Leverage</i>	0.198*** (7.78)	9.925*** (16.86)	-0.545*** (-6.86)	0.207*** (4.69)	0.247*** (6.88)	0.103*** (4.39)	10.02*** (17.04)	-0.552*** (-6.96)	0.224*** (5.04)	0.264*** (7.41)	0.194*** (7.64)	10.02*** (17.03)	-0.553*** (-6.85)	0.212*** (4.79)	0.269*** (7.54)
<i>Cash_Holding</i>	1.793*** (58.80)	11.425*** (16.25)	0.556*** (5.86)	-0.675*** (-12.77)	0.373*** (-8.71)	1.293*** (43.97)	15.16*** (20.69)	0.154 (1.56)	-0.513 (-9.26)	-0.106** (-2.4)	1.766*** (57.58)	11.71*** (16.54)	0.521*** (5.45)	-0.664*** (-12.48)	-0.290*** (-6.76)
<i>Book_to_Market</i>	-0.150*** (28.2)	-0.250** (-2.03)	0.509*** (30.66)	-0.089*** (-9.7)	-0.164*** (-21.92)	-0.124*** (-25.31)	-0.331*** (-2.7)	0.513*** (31.08)	-0.095*** (-10.33)	-0.175*** (-23.58)	-0.148*** (-27.89)	-0.251** (-2.04)	0.509*** (30.62)	-0.090*** (-9.74)	-0.165*** (-22.18)
<i>Stock_Return</i>	0.635*** (87.51)	2.478*** (14.81)	0.032 (1.42)	0.096*** (7.68)	0.373*** (36.53)	0.640*** (95.43)	2.644*** (15.82)	0.0129 (0.57)	-0.095*** (-10.33)	0.376*** (37.14)	0.626*** (85.70)	2.504*** (14.83)	0.028*** (1.24)	0.099*** (7.84)	0.383*** (37.42)
<i>Sales_Growth</i>	0.181*** (39.33)	0.527*** (4.97)	0.021 (1.52)	0.060*** (-7.54)	0.375*** (58.03)	0.043*** (8.69)	1.487*** (11.85)	-0.092*** (-5.46)	0.100*** (7.96)	0.467*** (61.40)	0.185*** (40.05)	0.498*** (4.66)	0.024*** (1.73)	0.058*** (7.23)	0.367*** (56.67)
Intercept	1.344*** (15.52)	23.255*** (11.65)	-5.122*** (-18.99)	0.033 (0.22)	-2.017*** (-16.56)	0.945*** (11.02)	24.541 (11.48)	-5.255*** (-18.23)	0.064 (0.40)	-1.848 (-14.25)	0.619*** (4.95)	23.80*** (8.24)	-5.304*** (13.58)	0.290*** (1.33)	-1.527*** (-8.71)
Adjusted R ²	0.84	0.14	0.22	0.02	0.71	0.86	0.16	0.24	0.02	0.72	0.84	0.14	0.22	0.22	0.71
N	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973

Variables	Industry-Year Fixed Effect					State Fixed Effect					State-Industry Fixed Effect				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>Fin_Lit</i>	-0.075*	-1.248	0.362**	-0.014	-0.123*	-0.421***	-0.838	0.202*	0.092	0.317***	-0.330***	-1.851**	0.338***	0.050	0.236***
	(-1.72)	(-1.14)	(2.45)	(-0.17)	(-1.86)	(-12.76)	(-1.08)	(1.92)	(1.57)	(6.73)	(-10.75)	(-2.39)	(3.24)	(0.86)	(5.04)
<i>Firm_Size</i>	0.588***	-5.27530821	0.601***	-0.158***	0.187***	0.445***	-4.200***	0.485***	-0.108***	0.282***	0.585***	-5.213***	0.600***	-0.158***	0.192***
	(101.52)	(-36.52)	(30.85)	(-14.50)	(21.58)	(82.74)	(-33.09)	(28.29)	(-11.30)	(36.68)	(102.00)	(-35.94)	(30.67)	(-14.40)	(21.96)
<i>Leverage</i>	0.102***	10.09***	-0.556***	0.227***	0.284***	0.180***	9.760***	-0.535***	0.200***	0.232***	0.098***	10.00***	-0.557***	0.218***	0.246***
	(4.35)	(17.16)	(-7.01)	(5.11)	8.02	(7.23)	(16.59)	(-6.73)	(4.51)	(6.52)	(4.22)	(17.02)	(-7.04)	(4.88)	(6.96)
<i>Cash_Holding</i>	1.283***	15.29***	0.137	-0.510***	-0.046	1.629***	12.461***	0.469***	-0.643***	-0.202***	1.208***	15.57***	0.134	-0.507***	-0.000
	(43.50)	(20.79)	(1.39)	(-9.17)	(-1.04)	(53.52)	(17.36)	(4.84)	(-11.86)	(-4.65)	(41.28)	(21.05)	(1.35)	(-9.03)	(-0.01)
<i>Book_to_Market</i>	-0.123***	-0.323***	0.512***	-0.095***	-0.175**	-0.139***	-0.222*	0.505***	-0.090***	-0.169***	-0.117***	-0.281**	0.507***	-0.095***	-0.178***
	(-25.08)	(-2.64)	(30.97)	(-10.33)	(-23.72)	(-26.76)	(-1.81)	(30.43)	(-9.69)	(-22.74)	(-24.26)	(-2.29)	(30.73)	(-10.20)	(-24.08)
<i>Stock_Return</i>	0.635***	2.631***	0.013	0.102***	0.383***	0.643***	2.634***	0.015	0.099***	0.384***	0.647***	2.736***	0.003	0.102***	0.386***
	(93.96)	15.61	(0.62)	(8.00)	(37.76)	(89.64)	(15.57)	(0.67)	(7.80)	(37.42)	(96.91)	(16.22)	(30.73)	(7.99)	(37.97)
<i>Sales_Growth</i>	0.046***	1.470***	-0.090***	0.106***	0.455***	0.183***	0.465***	0.027*	0.059***	0.367***	0.054***	1.455***	-0.092***	0.107***	0.451***
	(9.26)	(11.62)	(-5.32)	(11.10)	59.69	(40.09)	(4.32)	(1.87)	(7.31)	(56.23)	(10.81)	(11.40)	(-5.35)	(11.04)	(58.66)
Intercept	0.461***	22.07***	-5.061***	0.217	-0.042	2.203***	43.93***	-7.363***	-0.106***	-1.835***	1.468***	46.87***	-7.748***	0.004	-1.549***
	(3.86)	(7.40)	(-12.58)	(0.96)	(-0.06)	(9.04)	(7.65)	(-9.48)	(-0.24)	(5.27)	(6.43)	(8.13)	(-9.96)	(0.01)	(-4.45)
Adjusted R ²	0.86	0.16	0.24	0.02	0.72	0.85	0.15	0.24	0.02	0.72	0.87	0.17	0.24	0.28	0.72
N	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973	23,973

Variables	State-Year Fixed Effect				
	Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables:					
<i>Fin_Lit</i>	-0.114	1.129	-0.373	-0.211	0.135
	(-1.19)	(0.50)	(-1.21)	(-1.23)	(0.99)
<i>Firm_Size</i>	0.444***	-4.173***	0.484***	-0.106***	0.290***
	(82.35)	(-32.80)	(28.16)	(-11.06)	(37.81)
<i>Leverage</i>	0.179***	9.841***	-0.536***	0.205***	0.252***
	(7.17)	(16.72)	(-6.75)	(4.62)	(7.12)
<i>Cash_Holding</i>	1.619***	12.688***	0.449***	-0.637***	-0.136***
	(52.99)	(17.60)	(4.61)	(-11.70)	(-3.15)
<i>Book_to_Market</i>	-0.139***	-0.216*	0.504***	-0.090***	-0.168***
	(-26.72)	(-1.76)	(30.32)	(-9.70)	(-22.79)
<i>Stock_Return</i>	0.642***	2.636***	0.017***	0.101***	0.387***
	(89.38)	(15.57)	(0.75)	(7.90)	(37.90)
<i>Sales_Growth</i>	0.184***	0.450***	0.026	0.058***	0.362***
	(40.19)	(4.17)	(1.85)	(7.12)	(55.67)
Intercept	1.369***	37.54***	-5.655*	0.734	-1.554***
	(3.90)	(4.53)	(-5.05)	(1.17)	(-3.11)
Adjusted R ²	0.85	0.15	0.23	0.02	0.72
N	23,973	23,973	23,973	23,973	23,973

Panel B: FCS Impact of Explanatory Variables on Firm Valuation and Profitability Metrics with No Fixed effect, Industry Fixed effect, Industry-Year Fixed effect, State Fixed effect, State-Industry Fixed effect, and State-Year Fixed Effect

Variables Experimental Variables	No Fixed Effect					Industry Fixed Effect					Year Fixed Effect				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>I_Fin_Lit</i>	0.342*** (-24.54)	-2.41*** (-7.43)	-0.233*** (5.47)	-0.123 (-0.49)	0.013 (0.71)	-0.286*** (-22.42)	-2.591*** (-8.01)	0.260*** (6.16)	-0.023 (-0.93)	-0.012 (-0.67)	-0.299*** (-20.22)	-2.192*** (-6.35)	0.195*** (4.31)	-0.031 (-1.18)	-0.010 (-0.51)
<i>Firm_Size</i>	0.531*** (199.22)	-4.700*** (-75.7)	-0.547*** (67.22)	-0.012 (-19.56)	0.259*** (70.45)	0.625*** (228.84)	-5.301*** (-76.64)	0.620*** (68.70)	-0.128*** (-24.06)	0.154*** (38.30)	0.528*** (197.18)	-4.705*** (-75.29)	0.552*** (67.32)	-0.089*** (-18.53)	0.269*** (73.18)
<i>Leverage</i>	0.038*** (2.99)	8.863*** (29.56)	-0.528*** (-13.43)	0.269 (11.67)	0.122*** (6.88)	0.007 (0.67)	9.062*** (30.11)	-0.550*** (-14.01)	0.288*** (12.39)	0.153*** (8.75)	0.029** (2.27)	8.838*** (29.36)	-0.507*** (-12.85)	0.286*** (12.34)	0.163*** (9.19)
<i>Cash_Holding</i>	1.471*** (99.05)	10.526*** (30.43)	0.283*** (6.23)	-0.582*** (-21.85)	-0.240*** (-11.76)	1.148*** (81.74)	12.706*** (35.71)	0.071 (1.55)	-0.475*** (-17.27)	0.038* (1.84)	1.456*** (97.60)	10.53*** (30.29)	0.288*** (6.32)	-0.566*** (-21.12)	-0.182*** (-8.91)
<i>Book_to_Market</i>	-0.156*** (-63.99)	-0.359*** (-6.32)	0.459*** (61.54)	-0.085*** (-19.4)	-0.114*** (-34.09)	-0.146*** (-65.57)	-0.363*** (-6.42)	0.455*** (61.49)	-0.086*** (-19.68)	-0.120*** (-36.50)	-0.155*** (-63.58)	-0.359*** (-6.32)	0.459*** (61.50)	-0.085*** (-19.60)	-0.116*** (-34.84)
<i>Stock_Return</i>	0.570*** (162.14)	3.060*** (37.38)	-0.400 (-3.81)	0.092*** (14.58)	0.336*** (69.39)	-0.146*** (190.68)	3.081*** (36.73)	-0.024** (-2.22)	0.092*** (14.27)	0.365*** (74.54)	0.565*** (160.12)	3.047*** (37.03)	-0.037*** (-3.52)	0.094*** (14.95)	0.344*** (71.06)
<i>Sales_Growth</i>	0.092*** (41.91)	0.787*** (15.41)	-0.066*** (-9.92)	0.054*** (13.95)	0.359*** (118.79)	0.631*** (2.17)	1.402*** (23.76)	-0.151*** (-19.71)	0.089*** (19.65)	0.454*** (131.99)	0.095*** (43.19)	0.799*** (15.50)	-0.071*** (-10.54)	0.051*** (12.89)	0.350*** (115.42)
Intercept	1.613*** (38.85)	25.17*** (26.04)	-4.294*** (-33.83)	0.176** (2.37)	-1.248* (-21.79)	1.123*** (26.80)	25.79*** (24.32)	-4.166** (-30.06)	0.144* (1.76)	-1.282*** (-20.69)	1.624*** (16.59)	25.31*** (11.09)	-4.326*** (-14.44)	0.322* (1.83)	-1.675*** (-12.45)
Adjusted R ²	0.84	0.14	0.20	0.01	0.72	0.87	0.15	0.22	0.02	0.73	0.84	0.14	0.20	0.02	0.72
N	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126

Variables Experimental Variables	Industry-Year Fixed Effect					State Fixed Effect					State-Industry Fixed Effect				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>I_Fin_Lit</i>	-0.254*** (-18.79)	-2.284*** (-6.65)	0.207*** (4.62)	-0.0387 (-1.45)	-0.025 (-1.27)	-0.324*** (-23.73)	-2.151*** (-6.57)	0.201*** (4.69)	-0.005 (-0.21)	0.024 (1.28)	-0.261*** (-20.20)	-2.368*** (-7.31)	0.246*** (5.66)	-0.027 (-1.07)	-0.005 (-0.30)
<i>Firm_Size</i>	0.623*** (226.39)	-5.322*** (-76.25)	0.628*** (68.93)	-0.124*** (-22.96)	0.166*** (40.94)	0.524*** (200.23)	-4.584*** (-73.18)	0.528*** (64.38)	-0.094*** (-19.55)	0.251*** (68.61)	0.632*** (228.62)	-4.960*** (-71.51)	0.591*** (63.39)	-0.131*** (-23.54)	0.160*** (38.75)
<i>Leverage</i>	0.003 (0.30)	8.995*** (29.77)	-0.524*** (-13.28)	0.303*** (12.97)	0.187*** (10.68)	0.053*** (4.29)	8.599*** (28.65)	-0.473*** (-12.03)	0.269*** (11.59)	0.151*** (8.60)	0.036*** (3.04)	8.919*** (29.79)	-0.483*** (-12.08)	0.285*** (11.89)	0.177*** (9.99)
<i>Cash_Holding</i>	1.140*** (80.90)	12.66*** (35.47)	0.080* (1.73)	-0.464*** (-16.80)	0.079*** (3.83)	1.394*** (95.32)	11.06*** (31.64)	0.263*** (5.75)	-0.551*** (-20.36)	-0.088*** (-4.32)	1.144*** (80.22)	13.48*** (37.63)	0.027 (0.58)	-0.503*** (-17.51)	0.120*** (5.64)
<i>Book_to_Market</i>	-0.145*** (-65.19)	-0.363*** (-6.40)	0.454*** (61.44)	-0.087*** (-19.84)	-0.122*** (-37.13)	-0.159*** (-67.00)	-0.319*** (-5.62)	0.448*** (60.16)	-0.086*** (-19.64)	-0.125*** (-37.88)	-0.136*** (-58.73)	-0.451*** (-7.68)	0.477*** (60.89)	-0.094*** (-20.06)	-0.139*** (-40.13)
<i>Stock_Return</i>	0.628*** (188.68)	3.062*** (36.31)	-0.020* (-1.86)	0.094*** (14.54)	0.371*** (75.81)	0.621*** (175.91)	3.085*** (36.52)	-0.012*** (-1.14)	0.097*** (14.95)	0.383*** (77.46)	0.639*** (188.31)	2.733*** (32.22)	-0.001 (-0.14)	0.097*** (14.34)	0.404*** (79.40)
<i>Sales_Growth</i>	0.007*** (3.22)	1.425*** (23.92)	-0.159*** (-20.48)	0.085*** (18.55)	0.444*** (128.28)	0.099*** (45.86)	0.731*** (14.15)	-0.057*** (-8.46)	0.056*** (14.01)	0.383*** (120.28)	0.014*** (6.19)	1.363*** (22.97)	-0.133*** (-16.60)	0.088*** (18.67)	0.450*** (126.28)
Intercept	1.040*** (11.40)	26.30*** (11.37)	-4.254*** (-14.09)	0.310* (1.74)	-1.618*** (-12.03)	2.055*** (15.23)	39.53*** (12.26)	-7.543*** (-17.84)	0.124 (0.50)	-0.918*** (-4.87)	1.389*** (11.16)	22.80*** (21.34)	-7.409*** (-17.63)	0.147* (1.72)	-1.016*** (-5.44)
Adjusted R ²	0.87	0.15	0.207***	0.02	0.73	0.85	0.15	0.21	0.02	0.72	0.88	0.15	0.23	0.02	0.74
N	100126	100126	100126	100126	100126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126	100,126

Variables	State-Year Fixed Effect				
	<i>Valuation Measurement</i>		<i>Profitability Measurement</i>		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables:					
<i>I_Fin_Lit</i>	-0.285*** (-18.93)	-1.786*** (-5.07)	0.185*** (3.92)	-0.030 (-1.07)	-0.002 (-0.11)
<i>Firm_Size</i>	0.526*** (195.18)	-4.158*** (-65.87)	0.506*** (59.85)	0*** (-17.80)	0.262*** (69.50)
<i>Leverage</i>	0.075*** (5.85)	8.364*** (27.84)	-0.417*** (-10.36)	0.282*** (11.71)	0.199*** (11.12)
<i>Cash_Holding</i>	1.453*** (95.95)	11.795*** (33.27)	0.222*** (4.67)	-0.568*** (-19.96)	-0.013 (-0.64)
<i>Book_to_Market</i>	-0.147*** (-58.70)	-0.377*** (-6.41)	0.478*** (60.71)	-0.094*** (-19.96)	-0.137*** (-39.13)
<i>Stock_Return</i>	0.608*** (165.70)	2.594*** (30.19)	0.006 (0.58)	0.104*** (15.09)	0.407*** (79.47)
<i>Sales_Growth</i>	0.113*** (50.58)	0.620*** (11.84)	-0.043*** (-6.19)	0.049*** (11.80)	0.357*** (114.23)
Intercept	1.976*** (12.32)	39.11*** (10.42)	-7.516*** (-14.93)	0.229*** (0.76)	-1.333*** (-5.94)
Adjusted R ²	0.86	0.15	0.22	0.02	0.73
N	100126	100126	100126	100126	100126

Table 5
Sub-period Analysis with Industry Fixed effect

Table 5 presents the baseline results using sub-period analysis with Industry Fixed effect. Panel A shows the impact of each explanatory variable on the dependent variables. The sample consists of the role of financial literacy surveys and firms' valuation and profitability performance using. Panel B presents the baseline results using sub-period analysis with FCS shows the impact of each explanatory variable on the dependent variables. The sample consists of the role of financial literacy surveys and firms' valuation and profitability performance. Both panel uses NFCS and COMPUSTAT data. *, **, *** Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, based on a two-tailed test. The t-statistics appear in the parentheses. Variables are defined in the Appendix. All continuous variables are winsorized at the 1% and 99% levels.

Panel A: Analysis for Sub-periods with Industry Fixed effect based on NFCS and COMPUSTAT data.

Variables	2009					2012					2015				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
Experimental Variables	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>Fin_Lit</i>	0.714*** (5.04)	-4.986** (3.04)	1.145*** (2.58)	0.192 (0.77)	-0.830*** (-4.22)	-0.105 (-1.04)	-5.680** (-2.07)	0.656* (1.88)	-0.179 (0.99)	-0.319*** (-2.69)	-0.399*** (-4.48)	1.492 (0.68)	0.217 (0.47)	0.067 (0.4)	0.494*** (3.92)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-2.017*** (2.17)	28.04*** (2.34)	-7.013*** (-5.05)	-0.414 (-0.53)	1.055* (1.72)	0.867*** (2.92)	39.43*** (4.91)	-6.575*** (-6.41)	0.924* (1.73)	-0.512 (-1.47)	1.467*** (5.79)	11.53* (1.86)	-4.966*** (-5.73)	0.148 (0.31)	-2.883*** (-8.04)
Adjusted R ²	0.84	0.53	0.21	0.01	0.68	0.83	0.16	0.23	0.01	0.77	0.84	0.16	0.25	0.02	0.71
N	4942	4942	4942	4942	4942	4891	4891	4891	4891	4891	4880	4880	4880	4880	4880

Variables	2018					2021				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
Experimental Variables:	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>Fin_Lit</i>	0.308** (2.39)	-3.381 (-1.18)	0.907** (2.33)	-0.160 (-0.73)	-0.589*** (-3.36)	0.058 (0.61)	-0.614 (-0.31)	0.060 (0.25)	-0.027 (-0.18)	0.585 (-0.55)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-0.480 (-1.35)	27.21*** (3.44)	-6.36*** (-5.94)	0.348 (0.57)	-0.267 (-0.55)	0.485* (1.95)	22.72*** (4.46)	-3.773*** (-5.97)	0.184 (0.47)	-1.427*** (-3.45)
Adjusted R ²	0.84	0.14	0.22	0.02	0.75	0.83	0.14	0.18	0.03	0.66
N	4502	4502	4502	4502	4502	4758	4758	4758	4758	4758

Panel B: FCS Impact on Analysis for Sub-periods with Industry Fixed effect based on NFCS and COMPUSTAT data.

Variables	2009					2012					2015				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
Experimental Variables	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>I_Fin_Lit</i>	-0.601*** (-9.19)	0.771 (0.59)	-0.477** (-2.45)	0.043 (0.39)	-0.768*** (-8.79)	-0.300*** (-4.48)	-3.867** (-2.21)	0.375* (1.65)	-0.069 (-0.56)	-0.278*** (-3.54)	-0.356*** (-5.57)	-0.610 (-0.4)	0.054 (0.24)	0.007 (0.06)	0.378*** (4.25)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	2.304*** (11.46)	9.888** (2.48)	-1.587*** (-2.66)	-0.018 (-0.06)	1.067*** (3.98)	1.589*** (8.07)	31.86*** (6.21)	-5.298*** (-7.92)	0.472 (1.29)	-0.355 (-1.54)	1.493*** (8.06)	16.34*** (3.67)	-4.317*** (-6.56)	0.244 (0.66)	-2.145*** (-8.32)
Adjusted R ²	0.83	0.12	0.19	0.01	0.69	0.84	0.14	0.21	0.02	0.78	0.84	0.16	0.25	0.01	0.71
N	6784	6784	6784	6784	6784	7109	7109	7109	7109	7109	6985	6985	6985	6985	6985

Variables	2018					2021				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
Experimental Variables:	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
<i>I_Fin_Lit</i>	0.267*** (3.48)	-4.431** (-2.39)	0.928*** (3.96)	-0.067 (-0.49)	0.251*** (2.43)	0.314*** (5.22)	0.235 (0.18)	0.339** (2.07)	-0.036 (-0.36)	0.550*** (5.73)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-0.094 (-0.43)	31.56*** (5.98)	-6.00*** (-9)	0.314 (0.8)	-2.079 (-7.07)	0.044 (0.26)	22.01*** (5.92)	-4.421*** (-9.6)	0.215 (0.76)	-2.685*** (-9.94)
Adjusted R ²	0.85	0.14	0.20	0.01	0.75	0.83	0.14	0.18	0.02	0.67
N	6362	6362	6362	6362	6362	6511	6511	6511	6511	6511

Table 6
Sub-Industry Analysis with Year Fixed effect

Table 6 presents the baseline results using sub-industry analysis with Year Fixed effect. Panel A shows the impact of each explanatory variable on the dependent variables. The sample consists of the role of financial literacy surveys and firms' valuation and profitability performance. Panel B shows the FCS impact using sub-period analysis for each explanatory variable on the dependent variables. The sample consists of the role of financial literacy surveys and firms' valuation and profitability performance using NFCS and COMPUSTAT data. *, **, *** Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, based on a two-tailed test. The t-statistics appear in the parentheses. Variables are defined in the Appendix. All continuous variables are winsorized at the 1% and 99% levels.

Panel A: Analysis for Sub-Industry with Year Fixed effect based on NFCS and COMPUSTAT data.

Variables	Agriculture					Mining					Construction				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables															
<i>Fin_Lit</i>	-0.084 (-0.16)	-11.58 (-0.92)	2.252 (1.03)	0.598 (0.63)	-0.278 (-0.41)	0.235** (2.08)	0.119 (0.04)	-0.013 (-0.03)	0.186 (0.76)	-0.313 (-1.55)	-0.703*** (-2.9)	-20.65*** (-2.61)	0.485 (0.53)	-0.487 (-1.37)	-1.040*** (-2.66)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	1.344 (0.86)	52.83 (1.41)	-14.84** (-2.28)	-1.283 (-0.45)	-0.170 (-0.08)	0.348 (1.05)	25.28*** (2.7)	-5.725*** (-4.3)	-0.183 (-0.25)	0.422 (0.71)	2.745*** (3.87)	99.88*** (4.33)	-6.378** (-2.4)	1.280 (1.23)	1.200 (1.05)
Adjusted R ²	0.84	0.38	0.47	0.22	0.74	0.85	0.22	0.26	0.03	0.52	0.85	0.29	0.22	0.07	0.71
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	72	72	72	72	72	1432	1432	1432	1432	1432	251	251	251	251	251

Variables	Manufacturing					Transporting					Wholesale Trade				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables															
<i>Fin_Lit</i>	-0.056 (-1.46)	-2.330** (-2.18)	0.390*** (2.77)	-0.023 (-0.25)	0.032 (0.52)	-0.261*** (-2.85)	-2.540* (-1.81)	0.142 (0.61)	-0.069 (-0.47)	0.447*** (3.04)	-0.126 (-0.87)	-2.128 (-0.43)	-0.114 (-0.19)	0.063 (0.27)	0.189 (1.04)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	0.872*** (7.54)	25.85*** (8.05)	-4.889*** (-11.57)	0.229 (0.83)	-1.634*** (-8.64)	0.761*** (2.71)	13.59*** (3.16)	-2.969*** (-4.13)	0.332 (0.73)	-3.52*** (-7.79)	0.728* (1.7)	29.36** (2.01)	-4.106** (-2.34)	0.229 (0.33)	-2.294*** (-4.29)
Adjusted R ²	0.89	0.14	0.23	0.03	0.74	0.88	0.13	0.16	0.01	0.75	0.88	0.23	0.32	0.01	0.82
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9349	9349	9349	9349	9349	1686	1686	1686	1686	1686	671	671	671	671	671

Variables	Retail Trade					Finance					Service				
	<i>Valuation Measurement</i>		<i>Profitability Measurement</i>			<i>Valuation Measurement</i>		<i>Profitability Measurement</i>			<i>Valuation Measurement</i>		<i>Profitability Measurement</i>		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables															
<i>Fin_Lit</i>	0.180*	-0.586	0.314	-0.226	0.710***	-0.524	0.810	0.215**	0.006	-0.444***	-0.495***	-3.996**	0.513**	0.346***	0.886***
	(1.82)	(-0.49)	(1.2)	(-1.12)	(3.72)	(-9.44)	(0.92)	(2.04)	(0.09)	(-6.26)	(-8.54)	(-2.12)	(2.1)	(2.69)	(8.37)
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Control Variables															
Intercept	-0.575*	6.632*	-3.592***	1.220**	-4.439***	0.887***	5.585**	-2.462***	-0.014	-0.630***	2.242***	32.54***	-5.954***	-0.898**	-3.687***
	(-1.95)	(1.87)	(-4.6)	(2.02)	(-7.81)	(5.06)	(2.01)	(-7.39)	(-0.07)	(-2.82)	(12.94)	(5.78)	(-8.17)	(2.34)	(-11.67)
Adjusted R ²	0.91	0.08	0.14	0.02	0.72	0.85	0.15	0.10	0.02	0.75	0.89	0.19	0.29	0.01	0.63
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1144	1144	1144	1144	1144	5012	5012	5012	5012	5012	4010	4010	4010	4010	4010

Variables	Public Administration				
	<i>Valuation Measurement</i>		<i>Profitability Measurement</i>		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables:					
<i>Fin_Lit</i>	-0.277	-13.77	3.434*	-0.926	-0.127
	(-1.03)	(-1.04)	(1.86)	(-1.45)	(-0.53)
Yes	Yes	Yes	Yes	Yes	Yes
All Control Variables					
Intercept	1.716**	69.37*	-22.37***	3.538*	-0.042
	(2.17)	(1.8)	(-4.14)	(1.89)	(-0.06)
Adjusted R ²	0.86	0.28	0.40	0.01	0.81
Year Fixed effect	Yes	Yes	Yes	Yes	Yes
N	346	346	346	346	346

Panel B: FCS Impact on Analysis for Sub-Industry with Year Fixed effect based on NFCS and COMPUSTAT data.

Variables	Agriculture					Mining					Construction				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables															
<i>I_Fin_Lit</i>	-0.316 (-1.38)	-3.606 (-0.52)	0.009 (0.01)	0.253 (0.6)	-0.735** (-2.32)	-0.165*** (-5.69)	-2.638*** (-3.16)	0.238** (2.02)	-0.004 (-0.06)	-0.123*** (-2.76)	-0.264** (-2.38)	-1.740 (-0.48)	0.112 (0.3)	-0.010 (-0.06)	-0.318 (-1.62)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	2.335*** (3.52)	40.52** (2.01)	-6.24** (-2.54)	0.274 (0.22)	0.913 (0.99)	-1.119*** (-13.02)	26.34*** (10.7)	-4.599*** (-13.18)	0.059 (0.28)	0.242* (1.84)	1.580*** (4.81)	45.74*** (4.22)	-3.570*** (-3.22)	-0.131 (-0.24)	-1.101* (-1.89)
Adjusted R ²	0.84	0.24	0.30	0.06	0.69	0.88	0.15	0.21	0.01	0.61	0.87	0.28	0.23	0.10	0.69
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	352	352	352	352	352	15631	15631	15631	15631	15631	877	877	877	877	877

Variables	Manufacturing					Transporting					Wholesale Trade				
	Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement			Valuation Measurement		Profitability Measurement		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables															
<i>I_Fin_Lit</i>	-0.219** (-11.11)	-2.866*** (-5.3)	0.246*** (3.49)	-0.047 (-0.98)	-0.002 (-0.06)	-0.274*** (-6.16)	-2.856*** (-3.32)	0.276** (2.47)	0.043 (0.57)	0.045 (0.62)	-0.236*** (-3.01)	-2.561 (-1.05)	-0.146 (-0.56)	-0.145 (-1.32)	-0.092 (-0.97)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	1.379*** (23.45)	27.87*** (17.33)	-4.410*** (-20.99)	0.223 (1.56)	-1.429*** (-15.32)	0.921*** (6.85)	16.521*** (6.38)	-3.127*** (-9.26)	0.048 (0.21)	-2.333*** (-10.59)	1.291*** (5.51)	32.92*** (4.53)	-3.301** (-4.22)	0.483 (1.47)	-1.468*** (-5.19)
Adjusted R ²	0.89	0.14	0.22	0.03	0.74	0.89	0.15	0.19	0.01	0.75	0.87	0.21	0.23	0.01	0.81
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	34572	34572	34572	34572	34572	6987	6987	6987	6987	6987	2514	2514	2514	2514	2514

Variables	Retail Trade					Finance					Service				
	<i>Valuation Measurement</i>		<i>Profitability Measurement</i>			<i>Valuation Measurement</i>		<i>Profitability Measurement</i>			<i>Valuation Measurement</i>		<i>Profitability Measurement</i>		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables															
<i>I_Fin_Lit</i>	-0.139*	-1.131	-0.11	-0.099	0.201**	-0.411***	-0.325	0.104**	-0.016	-0.223***	-0.337***	-3.938***	0.338***	-0.094	0.293***
	(-2.52)	(-1.08)	(-0.92)	(-0.91)	(1.99)	(-13.75)	(-0.83)	(2.16)	(-0.51)	(-6.3)	(-10.6)	(-3.78)	(2.69)	(-1.34)	(5.31)
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Control Variables															
Intercept	0.480***	15.01***	-2.094***	0.297	-2.801***	1.032***	7.201***	-1.627***	0.014	-1.108***	1.889***	36.66***	-5.140***	0.425**	-1.879***
	(2.89)	(4.78)	(-5.32)	(0.9)	(-9.23)	(11.15)	(5.94)	(-10.85)	(0.15)	(-10.11)	(20.02)	(11.86)	(-13.78)	(2.04)	(-11.49)
Adjusted R ²	0.89	0.08	0.13	0.02	0.71	0.83	0.12	0.08	0.01	0.76	0.89	0.19	0.25	0.01	0.62
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4124	4124	4124	4124	4124	18680	18680	18680	18680	18680	14874	14874	14874	14874	14874

Variables	Public Administration				
	<i>Valuation Measurement</i>		<i>Profitability Measurement</i>		
	Market_Cap	Tobin_Q	ROA	ROE	EBIT
Experimental Variables:					
<i>I_Fin_Lit</i>	-0.295**	-8.734	1.694**	0.364	-0.177*
	(-2.3)	(-1.42)	(2.06)	(1.25)	(-1.77)
	Yes	Yes	Yes	Yes	Yes
All Control Variables					
Intercept	2.023***	56.33***	-17.56***	-0.364	0.248
	(2.17)	(3.14)	(-7.34)	(-0.5)	(0.85)
Adjusted R ²	0.82	0.24	0.40	0.01	0.78
Year Fixed effect	Yes	Yes	Yes	Yes	Yes
N	1515	1515	1515	1515	1515

Table 7
Robustness Baseline Results with Firm Fixed effect

Table 7 presents four panels to further strengthen the main findings. To conserve space, the Panels do not report the control variables. The sample consists of 23973 and 100126 from 2009 to 2024. *, **, *** Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, based on a two-tailed test. The t-statistics appear in the parentheses. Variables are defined in the Appendix. All continuous variables are winsorized at the 1% and 99% levels.

Panel A: Impact of Explanatory Variables on Firm Valuation and Profitability Metrics with Firm Fixed effect

Variables	Valuation Measurement		Profitability Measurement		
	Market_ Cap	Tobin_ Q	ROA	ROE	EBIT
Experimental Variables:					
<i>Fin_Lit</i>	0.098** *	- 1.428* **	0.733* **	-0.029	- 0.291* **
	(4.61)	(-1.9)	(7.67)	(-0.39)	(-6.25)
All Control Variables	Yes	Yes	Yes	Yes	Yes
R ²	0.97	0.74	0.79	0.48	0.91
Firm Fixed effect	Yes	Yes	Yes	Yes	Yes
N	23973	23973	23793	23793	23793

Panel B: FCS Impact of Explanatory Variables on Firm Valuation and Profitability Metrics with Firm Fixed effect

Variables	Valuation Measurement		Profitability Measurement		
	Market_ Cap	Tobin_ Q	ROA	ROE	EBIT
Experimental Variables:					
<i>I_Fin_Lit</i>	- 0.051** *	- 0.555* **	0.116* **	-0.033	-0.066
	(-7.23)	(-2.2)	(3.61)	(-1.31)	(-4.89)
All Control Variables	Yes	Yes	Yes	Yes	Yes
R ²	0.97	0.62	0.66	0.24	0.89
Firm Fixed effect	Yes	Yes	Yes	Yes	Yes
N	100126	10012 6	10012 6	10012 6	100126