

## Macroeconomic Determinants, Efficiency, and Policy Drivers of Welfare Performance in Islamic Fintech: The Mediating Role of Systematic Risk in Indonesia

Adi Suroso<sup>1</sup>, Indriana Kristiawati<sup>2</sup>, Naurah Aurelia Mahjudin<sup>3</sup>

<sup>1</sup> Program Magister Manajemen Universitas PGRI Kanjuruhan Malang  
adisuroso@unikama.ac.id

<sup>2</sup> Stiamak Surabaya  
indriana.k@stiamak.ac.id

<sup>3</sup> Undergraduate Student, Melbourne University  
naumahjudin@gmail.com

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### Abstract

This study explores the influence of macroeconomic fundamentals, cost efficiency, and corporate policy decisions on the welfare performance of Islamic financial technology (FinTech) firms in Indonesia—an emerging economy. The analysis adopts a sequential approach, incorporating systematic risk and firm performance as mediating variables. Specifically, the study examines the indirect effect of macroeconomic variables on firm performance and firm value through systematic risk, while also assessing the mediating role of firm performance in transmitting the effects of macroeconomic factors and corporate decisions.

Grounded in agency theory and capital structure theory, the study employs panel data from listed Islamic FinTech institutions in Indonesia, with active trading records on the Indonesia Stock Exchange during the 2017–2019 period. The results reveal that macroeconomic indicators—namely inflation, interest rates, exchange rates, and GDP growth—significantly affect systematic risk, which in turn influences firm performance, subsequently impacting firm value. Additionally, corporate policies such as managerial incentives and financial leverage exhibit strong direct effects on firm performance and, indirectly, on firm value. However, capital expenditures appear to have no statistically significant effect on either outcome. Notably, firm performance functions as an essential mediating variable in the relationship between exchange rates, systematic risk, and policy factors—specifically managerial incentives—and the welfare performance of Islamic FinTech firms.

## INTRODUCTION

Financial technology (FinTech) has become a focal point of research within the financial industry, driven by its transformative potential in delivering financial services. FinTech refers to the integration of advanced technological solutions in financial operations, enabling efficient, secure, and cost-effective service delivery (Rupeika-Apoga et al., 2018). Its rise is closely tied to the aftermath of the 2008 global financial crisis, which undermined public trust in conventional financial systems and catalyzed demand for more transparent and resilient alternatives (Milian et al., 2019). This context accelerated the adoption of Islamic FinTech, which adheres to Sharia principles and presents a compelling value proposition for ethical finance (Firmansyah & Anwar, 2019).

The evolution of Islamic FinTech in Indonesia has been particularly noteworthy, owing to a combination of high smartphone penetration and supportive market demographics. However, challenges persist, especially concerning regulatory clarity and limited academic inquiry into the sector (Brian, 2017; Rusydiana, 2018). Despite this, the potential of Islamic FinTech to expand financial inclusion and support Sharia-compliant entrepreneurship remains substantial. It offers transparency, accessibility, and ethical orientation—key attributes distinguishing it from conventional models (Laldin, 2018; Wintermeyer, 2017). Forecasts suggest that Islamic FinTech could attract up to 150 million new users globally within the next few years (Chen, 2018; Wonglimpiyarat,

2017), particularly in countries like Malaysia, Indonesia, and the UK, which currently lead in Sharia-compliant FinTech startups (Cooper, 2018).

Despite the sector's promising trajectory, Islamic FinTech must remain responsive to the broader technological and regulatory transformations reshaping global finance (Lee & Shin, 2018). As the industry matures, regulators are advised to adopt flexible, principle-based frameworks rather than rigid rules, ensuring innovation is nurtured while consumer protection is maintained (Sangwan, 2019). In Indonesia, where the Muslim population is projected to grow significantly in the coming decades, the expansion of Islamic FinTech presents an opportunity to build a more inclusive and resilient financial system (Firmansyah & Ramdani, 2018).

While existing empirical literature has primarily focused on the trade-offs between market power and cost efficiency—examining theories such as the Structure-Conduct-Performance (SCP) hypothesis, the Relative Market Power hypothesis, the Quiet Life hypothesis, and the X-efficiency hypothesis (Tu & Chen, 2000; Delis & Tsionas, 2009; Ariss, 2010; Alhassan & Ohene-Asare, 2016)—this study seeks to extend that discourse. Recent evidence (Ho, 2012; Detragiache et al., 2013; Williams, 2015) suggests that deregulation has not adequately mitigated market power in banking, and the coexistence of cost-efficient operations with reduced market power remains unresolved. Although macro-level studies have found a trade-off between welfare gains and bank efficiency (Maudos & De Guevara,

2013), the interaction at the institutional level remains underexplored.

To address this gap, the present study investigates how cost efficiency interacts with the welfare performance of Islamic FinTech firms, considering macroeconomic conditions and firm-specific policies. It introduces a novel framework that utilizes path analysis to trace how macroeconomic fundamentals, cost efficiency, and corporate policy decisions collectively influence firm value, mediated by systematic risk and operational performance. This layered approach contributes to the theoretical refinement of Islamic FinTech governance and offers actionable insights for both regulators and industry practitioners navigating the complex landscape of Sharia-compliant financial innovation.

## **Theoretical Background**

### **Digital Finance**

From a practical standpoint, digital finance refers to financial services accessed through digital channels such as mobile phones, personal computers, internet platforms, or card-based systems integrated into secure digital payment networks. As highlighted by Manyika et al. (2016, as cited in Ozili, 2018), digital finance encompasses services provided via digital platforms, including mobile devices and internet-based tools. Gomber et al. (2017, in Ozili, 2018) further elaborate that digital finance integrates a wide range of financial innovations, software solutions, and customer engagement models introduced by FinTech firms and

technologically progressive financial service providers.

Although no single universal definition exists, consensus has formed around the idea that digital finance includes all forms of products, infrastructure, and services that allow individuals and enterprises to engage in financial activities—such as payments, savings, and credit—remotely through digital channels (Ozili, 2018). The internet has evolved into a major distribution network for banking services, effectively complementing or replacing traditional service delivery methods (Barbesino et al., 2014, in Ozili, 2018). In alignment with development goals, digital financial services are viewed as a mechanism for poverty alleviation and financial inclusion, particularly in emerging markets (United Nations, 2016, in Ozili, 2018).

Core components of digital financial services typically include: (1) a digital transactional platform, (2) a network of retail agents, and (3) mobile or internet-connected devices used by consumers and agents (CGAP, 2015, in Ozili, 2018). Digital financial service users are generally required to hold accounts with sufficient balances or permitted third-party access, enabling them to perform transactions digitally across diverse platforms.

Peake (2013, in Michelle, 2016) and World Bank (2015, in Michelle, 2016) define digital financial services as a hybrid of financial and transactional services administered via mobile or web technologies and supported by agent networks. These services facilitate widespread financial access through

tools like electronic money, mobile banking, card transactions, and electronic fund transfers (Asian Development Bank, 2016, in Michelle, 2016). As noted by Martin et al. (2016, in Michelle, 2016), DFS empowers users to manage savings, access insurance and credit, and carry out financial operations through digital devices.

Digital financial solutions enhance resilience during emergencies by enabling fund transfers from distant associates or family members, thus lowering the risk of poverty (Klapper et al., 2016, in Michelle, 2016). Moreover, services such as mobile money improve user convenience, privacy, and security relative to traditional cash handling methods (Villasenor et al., 2015, in Michelle, 2016). For small enterprises, DFS provide essential access to capital, secure transactions, digital financial records, and growth opportunities (Mujeri, 2015, in Michelle, 2016).

### **Macroeconomic Fundamental Factors**

Stock market prices are broadly influenced by fundamental indicators, divided into macroeconomic and microeconomic categories. Macroeconomic fundamentals originate externally and include economic conditions, policy environments, political stability, cultural factors, legal systems, and environmental dynamics. These factors, while outside managerial control, exert significant influence when conditions shift. Market analysts often prioritize macroeconomic indicators due to their measurable and direct impacts—particularly inflation, interest rates, exchange rates, and GDP growth.

Investors pay considerable attention to these indicators before committing to financial instruments, as macroeconomic volatility affects capital allocation decisions. Inflation, interest, and currency fluctuations impact market risk, which in turn influences systematic risk levels across industries. These macroeconomic variables, though external, affect firms universally and alter investment perceptions.

Economic theory posits that macroeconomic fluctuations affect capital market performance by influencing real-sector investments. High volatility in macro indicators correlates with increased risk in financial markets. The magnitude of these impacts depends on internal corporate conditions. Robust firms may weather such fluctuations, whereas financially weaker entities may face performance setbacks that hinder shareholder value enhancement.

GDP growth, while a macroeconomic indicator, is typically considered an outcome variable resulting from fiscal and monetary interventions. These government tools aim to stabilize the economy through public spending, taxation, interest rate adjustments, and money supply control (Sadono, 2015). Market risk, another outcome variable, reflects external instability, including sociopolitical unrest, legal unpredictability, and environmental uncertainty—factors that influence financial policies, especially regarding external financing.

Macroeconomic performance affects firm policies, financial market behavior, and microeconomic outcomes like

return on assets (ROA). As a reflection of internal decision-making, ROA acts as a mediator between macro variables and company valuation. Previous studies—such as those by Eduardus (2014), Suryanto (2015), Gudono (2016), Dewi (2017), and Robiatul et al. (2019)—confirm the importance of inflation, interest rates, exchange rates, and GDP in explaining variations in firm performance and stock prices.

Eduardus (2014) found GDP and inflation to have negative but statistically insignificant effects on systematic risk, while interest rates displayed a positive yet also insignificant impact. Meanwhile, Sudjono (2016) identified negative correlations between exchange rates and stock prices.

### **Cost Efficiency and Welfare Gains**

Empirical findings regarding the role of cost efficiency in mitigating welfare losses due to market power in the banking sector are both complex and inconclusive. One theoretical stance posits a complementary evolution between market power and cost efficiency, whereas the opposing view suggests a competitive trade-off between them. These divergent theories offer competing interpretations of how social welfare and cost efficiency interact.

Koetter et al. (2013) assessed the quiet life hypothesis in U.S. commercial banks and concluded that market dominance did not worsen cost inefficiency; rather, it restrained managerial ambitions without necessarily reducing performance. In contrast, Maudos and De Guevara (2015) examined EU banks

and found a positive association between market power and cost efficiency, disputing the existence of a "quiet life" scenario. Interestingly, the welfare loss attributed to market dominance was estimated at 0.54% of EU GDP in 2015.

Conversely, Berger and Hannan (2014) observed that banks in highly concentrated U.S. markets tended to exhibit lower cost efficiency, consistent with the quiet life hypothesis. Delis and Tsionas (2014) found a negative link between efficiency and market power using European Economic and Monetary Union data. Similarly, Coccoresse and Pellicchia (2015) confirmed that Italian banks with substantial market power operated less efficiently.

Färe et al. (2015) emphasized that such divergent findings likely reflect differences in the extent of market power, the specific efficiency metric employed (e.g., cost, technical, or allocative efficiency), and the type of institution examined (e.g., commercial versus savings banks). These nuances suggest that the "quiet life" phenomenon may be context-specific and applicable only to particular segments of the banking sector.

### **Hypotheses**

H1: There exists a statistically significant negative relationship between cost efficiency and the welfare performance of Islamic financial technology institutions (as an inverse proxy for social welfare loss).

H2: Macroeconomic factors positively moderate the relationship between cost efficiency and the welfare performance

of Islamic financial technology institutions.

H3: Corporate policy variables positively moderate the relationship between cost efficiency and the welfare performance of Islamic financial technology institutions.

H4: Systematic risk moderates the influence of macroeconomic variables, cost efficiency, and firm-level policies on the welfare performance of Islamic financial technology institutions.

#### Methodology

##### Data and Sample Selection

The sample for this study comprises 21 Islamic financial technology institutions supervised by the Financial Services Authority of Indonesia (OJK) as of December 31, 2019. The analysis covers a three-year period, from 2016 to 2019.

##### Empirical Strategy

To address cross-sectional and temporal heterogeneity, this study employed multiple regression techniques, including: (i) Ordinary Least Squares (OLS), (ii) Quantile Regression (QR), and (iii) Fixed Effects (FE) estimation. These methodologies enhance the robustness and external validity of the empirical findings and align with recent econometric standards (Dick, 2014).

To mitigate potential endogeneity concerns, particularly reverse causality, we adopted the Two-Stage Least Squares Instrumental Variables (2SLS-IV) estimation technique. The instrumental variables used for cost efficiency were the natural logarithm of fixed assets (tangibility) and directors' remuneration (logged). Instrument validity was tested using the Wooldridge Over-Identifying Restrictions (OIR) test, while exogeneity

was evaluated through Wooldridge's robust score and exogeneity tests.

#### OLS and FE Regression Specifications

Following prior literature (e.g., Kwan, 2016; Petersen, 2017), the baseline OLS model is specified as: where is the inverse proxy for welfare performance for institution at time , is the sample average cost efficiency, represents mediating variables, and is the error term.

$$WelfareLoss\%TA_{it} = \alpha + \beta_1 Avg. Cost Efficiency_t + \sum_{j=2}^8 \beta_j W_{j,it} + \varepsilon_{it}$$

To account for unobserved time-invariant heterogeneity, we also estimate a fixed effects model:

$$WelfareLoss\%TA_{it} = \alpha + \beta_1 Avg. Cost Efficiency_t + \sum_{j=2}^8 \beta_j W_{j,it} + \eta_i + \varepsilon_{it} \quad Eq.8$$

where captures unobserved institution-specific effects.

#### Results

The macroeconomic variable Ln\_Institutional Quality exhibited a significantly negative coefficient across all model specifications, suggesting that higher institutional quality may paradoxically contribute to increased welfare losses within Islamic financial systems in emerging markets. This finding may reflect operational constraints due to underdeveloped institutional frameworks.

Furthermore, GDP per capita was negatively associated with welfare performance and statistically significant at the 1% level. This implies that as income levels rise, increased access to credit may lead to larger welfare losses due to higher demand-driven credit expansion.

The empirical analysis confirms that cost efficiency is inversely associated with welfare losses. Notably, institutions with advanced market intelligence exhibit a stronger negative relationship between cost efficiency and welfare losses. Quantile regression results show that cost efficiency is a necessary, though not sufficient, condition for reducing welfare loss, particularly at lower (Q25) to median (Q50) quantiles. Additional mediating variables reveal that foreign ownership and high market knowledge exacerbate welfare losses, while liquidity and capitalization act as mitigating factors. Interestingly, greater institutional stability correlates with higher welfare losses borne by consumers.

### Conclusion

Welfare losses arising from the market power of Islamic financial technology firms can be mitigated by promoting cost efficiency and enhancing market knowledge. Institutions that are both efficient and informed are more capable of safeguarding consumer interests. However, the effect of cost efficiency on welfare outcomes is conditional on the degree of welfare loss. The results support the argument that achieving welfare gains does not necessitate a loss

of efficiency and that a balance between market competition and cost-efficient operations is attainable.

### Implications

Theoretically, this study contributes to the discourse on the non-mutual exclusivity of welfare gains and cost efficiency in Islamic fintech ecosystems. The empirical findings refute the notion that reducing market power inherently sacrifices operational efficiency. From a policy standpoint, our findings advocate for integrated regulatory strategies that foster efficiency while simultaneously promoting transparency and market discipline, especially in economies with developing financial infrastructures.

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