



# Digital Financial Services And Impact Of M&A In The Banking Sector Performance,Case: Indonesian Fintech M&A On Banking Sectors

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## ABSTRACT

This study examines the impact of bank acquisitions by financial technology (fintech) firms on the performance of conventional banks in Indonesia between 2017 and 2024. Employing a staggered Difference-in-Differences (DiD) approach with a double-robust estimator (did2s), the analysis focuses on four key indicators: market access (measured by the number of customer accounts), profitability (Net Interest Margin/NIM and Return on Assets/ROA), and operational efficiency (BOPO ratio). The findings reveal that fintech-led acquisitions significantly expanded customer accounts in the second year post-acquisition, indicating successful market reach. However, a sharp decline in NIM emerged in the first year, reflecting margin pressure. ROA showed initial improvement but diminished in subsequent years. No significant change was detected in the BOPO ratio, suggesting limited efficiency gains. These results indicate that digital integration yields immediate growth in customer base but slower improvements in financial metrics, shaped by integration challenges, regulatory factors, and competitive intensity. This study contributes to the Structure-Conduct-Performance (SCP) framework and Platform Economics by elucidating the complex dynamics of digital consolidation in Indonesia's banking sector.

## INTRODUCTION

Digitalization has become one of the driving forces behind the transformation of business models across sectors, including the financial sector in Indonesia. The growth of financial technology (fintech) firms as key players in Digital Financial Services (DFS) has introduced new competition to the conventional banking sector. The rapid expansion of fintech is supported by increasing internet penetration and the widespread use of smart devices. According to data from the Indonesian Internet Service Providers Association (APJII), the number of internet users in

Indonesia reached 221.6 million in 2024, equivalent to 79.5% of the total population. Meanwhile, smartphone usage reached 90.9% (Statista), further reinforcing the integration between technology and financial services.

On the other hand, regulatory dynamics have played a crucial role in shaping the structure and behavior of financial sector actors in Indonesia. One key policy is the implementation of the Financial Services Authority Regulation (POJK) No. 12/POJK.03/2020 concerning the consolidation of commercial banks, which mandates a minimum core capital of IDR 3 trillion. This regulation has triggered a wave of consolidation, particularly among Core Capital-Based Banks (Kelompok Bank Berdasarkan Modal Inti – KBMI) groups 1 and 2, in which fintech firms have undertaken strategic corporate actions to acquire banks as a means of expanding services and innovation in the Indonesian financial sector.

Such acquisition strategies allow fintech companies to accelerate business expansion and integrate their digital ecosystems with banking infrastructure. This vertical integration model not only facilitates licensing and operational advantages, but also creates opportunities for synergy in technology, customer base, and funding efficiency. Alongside these developments, the trend of fintech-led bank acquisitions in Indonesia has continued to grow. Since 2019, at least 12 banks have been acquired by fintech entities, most of which were followed by significant changes in ownership and operational strategy.

From a business perspective, fintech acquisitions of several Indonesian banks indicate that the banking sector remains attractive. According to the Indonesian Banking Statistics, the performance of the banking sector has shown a positive trajectory over the past decade, despite experiencing pressure during the COVID-19 pandemic. Total bank assets have continued to increase significantly, from approximately IDR 4,262 trillion in 2012 to IDR 11,765 trillion in 2023, reflecting the continued expansion of the banking sector in driving the national economy. In terms of efficiency, the BOPO ratio, which spiked to 86.58% in 2020, declined to 78.92% in 2023. However, profitability, as reflected by the Net Interest Margin (NIM), declined from 5.63% in 2016 to 4.81% in 2023, a trend suspected to be the result of intensifying competition. This raises a fundamental question: do such acquisitions have a tangible impact on bank performance? In Indonesia, this question remains underexplored and warrants further investigation.

From a corporate strategy perspective, Mergers and Acquisitions (M&A) play a central role in organizational transformation, especially in response to the digitalization of financial services. A merger is defined as the integration of two or more entities to form a new one, aiming to achieve cost efficiency, growth opportunities, or other financial benefits (Ravenscraft & Scherer, 1987). In contrast, an acquisition refers to the takeover of ownership shares or assets of an entity for the purpose of strategic business management (Martynova & Rennenberg, 2006; Chen & Findlay, 2003).

Fintech acquisitions of banks—and vice versa—have increasingly become a strategic response to technological disruption in the financial industry. However, the impact on entity performance remains a matter of academic debate. Several studies have found that fintech M&A enhances bank performance through digitalization and technology integration. Conversely, some research shows that acquisitions do not always produce immediate results and require time before their effects are observable. In some cases, negative or inconclusive impacts are reported due to challenges in integration, regulation, and strategic misalignment.

Murende et al. (2022) highlight the perspective of banks acquiring fintech firms, noting a significant increase in customer base due to more optimal integration of technology-based services. The use of fintech digital platforms has enabled broader access, including among unbanked populations, allowing faster and cheaper account opening. Similarly, Akhtar & Nosheen (2022) found that fintech M&A increased the number of accounts via market expansion, with average fund growth of 15–30% within three years post-acquisition, positively influencing bank profitability. On the other hand, NIM experienced pressure due to heightened competition. Meanwhile, Kai & Sim (2016) observed that in developing countries, fintech M&A did

not result in improved cost efficiency and, in fact, tended to have negative impacts due to integration complexity. Meanwhile, Zheng & Mao (2024) found that fintech M&A often fails to yield significant improvements in bank performance, as synergy expectations are frequently overstated. This aligns with Bikker (2010), who argued that although M&A can increase business scale, the high integration costs—both material and non-material—often erode financial benefits. Similarly, Cornett et al. (2021) found no significant impact of M&A on profitability.

In the Indonesian context, research on the impact of fintech acquisitions on the banking sector remains limited. Most existing studies focus on interbank M&A or Islamic bank spin-offs, with little attention to the specific effects of fintech-led acquisitions. This study seeks to address that gap by examining the causal impact of such acquisitions on market access (number of accounts), profitability (NIM and ROA), and operational efficiency (BOPO), using the Staggered Difference-in-Differences (DiD) method with a double-robust estimator (did2s).

The findings are expected to contribute to the academic literature by enhancing the understanding of how fintech integration affects conventional bank performance. Given the strategic role of the banking sector in Indonesia, this research is conducted over a limited observation period (2017–2024) to provide early insights for regulators. The ultimate aim is to inform policymaking regarding the effectiveness and consequences of fintech-driven acquisitions, helping authorities anticipate strategic risks and design appropriate interventions.

## LITERATURE REVIEW

In this study, digitalization and the development of Digital Financial Services (DFS) play a vital role in reshaping market structures and the behavior of business actors in the banking sector. One of the primary approaches used to analyze the relationship between market structure, firm behavior, and performance outcomes is the Structure-Conduct-Performance (SCP) paradigm. The SCP model posits that market structure—such as concentration levels, entry barriers, and the degree of vertical integration—affects the conduct of firms, which in turn influences overall market performance. Market performance is typically assessed through indicators such as efficiency, profitability, and stability. This framework was initially introduced by Bain (1951) and has since been refined within the New Empirical Industrial Organization (NEIO) perspective, as elaborated by Lee (2007).

Charlton and Perloff (2005) further note that the relationship among structure, conduct, and performance is not always unidirectional. In some contexts, profitable markets may attract new entrants, thereby altering existing market structures. Thus, the SCP framework is inherently dynamic, as changes in performance or conduct may themselves lead to structural shifts. The relevance of SCP to this study lies in its ability to analyze how fintech-led bank acquisitions may influence market structure (e.g., via increased concentration or synergy) and institutional behavior (e.g., through digitalization and competitive strategy), which ultimately affects bank performance. Moreover, an often-overlooked dimension of the SCP framework is how fintech mergers and acquisitions (M&A) can enhance financial inclusion, particularly by expanding access to formal financial services.

To enrich the analysis in the context of digital financial economics, the SCP paradigm is complemented by platform economics, which provides an analytical framework for two-sided markets. In this theory, entities do not merely serve one user group but act as intermediaries between two interdependent user groups via digital platforms. Rochet and Tirole (2003) explain that network effects are central in such platforms: an increase in users on one side of the market raises the value of the platform for users on the other side, enhancing overall value creation.

Fintech M&A can thus be seen as a strategic corporate maneuver to combine fintech's innovation and digital platform capabilities with the infrastructure and customer base of traditional banks. This corporate action enables synergy and/or integration of digital platforms, enhancing competitiveness through greater service reach, optimized economies of scope, and

expanded network externalities (Jullien & Sand-Zantman, 2020; Vincze et al., 2021). Through such consolidation, fintech firms can leverage the scale and customer trust inherent in banking institutions, while banks gain technological agility and operational efficiency from fintech partners.

Furthermore, Rietveld and Schilling (2021) emphasize that competition in the digital era undergoes a fundamental shift. While in the SCP framework, market concentration is often viewed as a sign of reduced competition, in the digital economy, concentration may instead reflect the outcome of strong network effects and technological innovation. In this sense, market dominance does not necessarily signal a lack of competition, as the threat of disruption remains high due to ongoing innovations.

By integrating the SCP and platform economics perspectives, this study views fintech acquisitions not merely as corporate transactions but as strategic repositioning within the digital competitive landscape. This integrated framework allows for a more comprehensive analysis of the structural, behavioral, and performance-related impacts on banks amid the ongoing digital transformation of Indonesia's financial industry. This approach is particularly relevant in Indonesia, where fintech firms increasingly leverage cross-sector digital platforms not only to expand services, but also to reshape structural competition. Therefore, the integration of SCP with platform economics offers a dynamic framework to capture evolving market boundaries and strategic behavior in platform-driven ecosystems.

## METHODS

This study adopts a quasi-experimental design to estimate the causal impact of bank acquisitions by fintech firms on the performance of conventional banks in Indonesia. Given that the acquisition events are not uniformly distributed across time or institutions, the analysis employs a Staggered Difference-in-Differences (DiD) approach. To address potential biases commonly associated with conventional two-way fixed effects (TWFE) estimators, this study utilizes the Double-Robust Difference-in-Differences estimator (did2s) as proposed by Gardner (2022), which accounts for heterogeneity in treatment timing and potential deviations from the parallel trends assumption.

The Average Treatment Effect on the Treated (ATT) is formally defined as:

$$[ATT]_{(g,t)} = E[Y_{it}(1) - Y_{it}(0) \mid G_i = g, t \geq g] \quad (1)$$

where

- $Y_{it}(1)$  : Actual outcome of bank  $i$  at time  $t$  after receiving treatment,
- $Y_{it}(0)$  : counterfactual outcome bank  $i$  at time  $t$  had it not received treatment,
- $G_i = g$  : The year in which bank  $i$  first received treatment,.
- $t \geq g$  : Period of observation at or after treatment assignment.

### Two types of ATT are estimated

- Overall ATT : average treatment effect across all post-treatment periods,
- Event-Time ATT : treatment effects by relative year, with year = 0 (year of acquisition) as the reference period.

### Estimation Procedure

Stage 1: Fixed Effects Projection. The outcome variable is first residualized by regressing it on bank and time fixed effects to eliminate unit-specific and time-specific heterogeneity:

$$Y_{it} = \theta_i + \delta_t + \varepsilon_{it} \quad (2)$$

where  $\theta_i$  and  $\delta_t$  denote bank and time fixed effects, respectively

The first stage of the estimator follows the approach proposed by Gardner (2022) through the did2s method. This step involves removing unit-specific and time-specific fixed effects by regressing the outcome variable on individual and time dummies. Importantly, this stage does not yet include the treatment variable, as its purpose is to isolate the residual variation attributable solely to the treatment, free from fixed heterogeneity. These residuals are then used in the second-stage regression, which introduces the treatment indicators along with covariates. This two-stage procedure enhances the robustness of DiD estimates, especially under staggered adoption and time-varying controls.

Stage 2: Treatment Estimation with Controls ;The residuals  $\epsilon_{it}$  from stage one are regressed on treatment variables and covariates

ATT Overall

$$\hat{\epsilon}_{it} = \beta \cdot D_{it} + [\gamma X^{\wedge}]_{it} + \mu_{it} \tag{3}$$

ATT Event time

$$\hat{\epsilon}_{it} = \sum_{(k \neq 0)} \beta_k \cdot D_{(k,it)} + [\gamma X^{\wedge}]_{it} + \mu_{it} \tag{4}$$

where,

- $D_{it}$  : post-treatment dummy (overall ATT)
- $D_{(k,it)}$  : event-time dummy for year  $k$  relative to treatment,
- $[X^{\wedge}]_{it}$  : covariate vector
- $\mu_{it}$  : error term

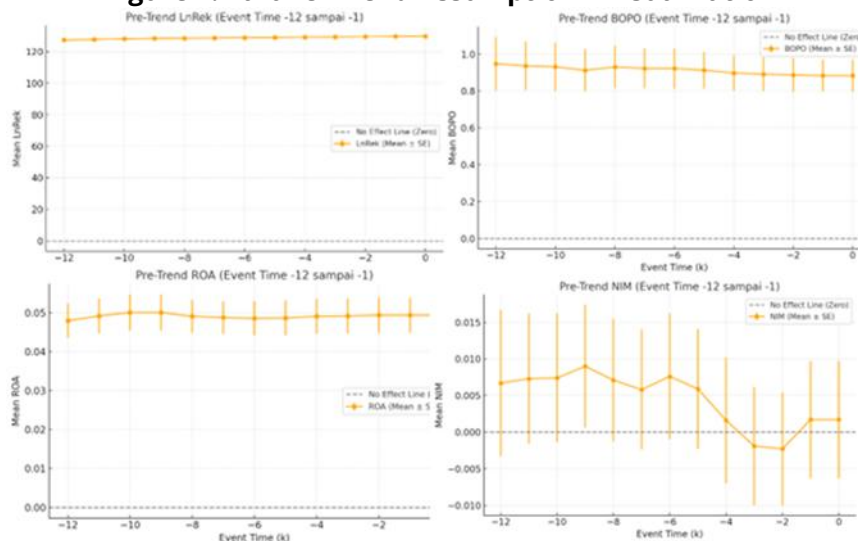
All standard errors are clustered at the bank level to account for autocorrelation and heteroskedasticity in the panel structure. Including covariates enhances estimation precision by addressing time-varying heterogeneity that may otherwise bias the ATT estimates.

## RESULTS AND DISCUSSION

### Parallel Trends Assumption Test

Prior to estimating the treatment effect of fintech acquisitions, it is essential to validate the parallel trends assumption, a fundamental requirement for causal inference in Difference-in-Differences (DiD) analysis. Two approaches are employed for this purpose. First, an event-study specification is estimated using monthly data for the period  $k = -12$  to  $k = -1$ , prior to treatment implementation.

**Figure 1. Parallel Trend Assumption - Visualization**



**Table 1 Parallel Trend Test**

Outcome	Event TimeCoef	P-value	95% CI	Interpretation
LnRek	0.0292	0.201	[-0.0181, 0.0766]	Not significant → Parallel trend assumption is met
BOPO	0.0055	0.287	[-0.0053, 0.0164]	Not significant → Parallel trend assumption is met
NIM	-0.0011	0.069	[-0.0023, 0.0001]	Nearly significant → Parallel trend assumption is fairly strong
ROA	-0.0002	0.584	[-0.0009, 0.0005]	Not significant → Parallel trend assumption is met

Average Treatment Effects on the Treated (ATTs) for each pre-treatment period are evaluated statistically and visualized with 95% confidence intervals. Second, an Ordinary Least Squares (OLS) regression is conducted on the pre-treatment period to test for trend differentials. The slope coefficients across all outcomes are statistically insignificant, indicating the absence of systematic differences in trends between treated and control groups. These results confirm the validity of the conditional parallel trends assumption, thereby supporting the interpretation of ATT estimates as causally meaningful.

#### **Treatment Effects of Fintech Acquisitions on Bank Performance**

The estimation results reveal heterogeneous and non-immediate effects of fintech acquisitions across various dimensions of bank performance.

**Table 2 ATT Overall**

Outcome	Coef ATT Overall	P-value	Significance	Interpretation
LnRek	+0.7156	0.025	Significant (5%)	Increase in the number of accounts post-acquisition
NIM	-0.0358	0.000	Significant (1%)	Significant decline in interest margin
ROA	+0.0102	0.121	Not significant	No significant impact on profitability
BOPO	+0.1203	0.055	Marginal (10%)	Indication of increased operating costs post-acquisition

**Table 3 ATT Event Time**

Outcome	Event Time	Coef $(\beta_t)$	ATT	P-value	Significance	Explanation
LnRek	t+1	+0.2743		0.373	Not significant	No significant effect yet on the number of accounts
	t+2	+0.1418		0.001	Significant (1%)	Significant positive impact on accounts in the second year
NIM	t+1	-0.0269		0.024	Significant (5%)	Decline in interest margin began in first year post-acquisition
	t+2	+0.0037		0.063	Marginal (10%)	Sign of recovery in interest margin, but not fully significant
ROA	t+1	+0.0156		0.028	Significant (5%)	Profitability improved significantly in the first year
	t+2	+0.0026		0.073	Marginal (10%)	Positive impact continued but not strongly significant
BOPO	t+1	+0.0972		0.292	Not significant	No significant evidence of changes in cost efficiency
	t+2	-0.0111		0.814	Not significant	Cost efficiency remained unchanged without meaningful variation

a. Market Access (LnRek)

The number of bank accounts, used as a proxy for market access, increases significantly in the post-acquisition period. While the overall ATT is statistically significant, the event-time specification indicates that the effect becomes prominent only in the second year following treatment. This delayed response suggests that the expansion of customer reach through fintech integration necessitates a transitional phase for technological alignment and user adaptation. The finding underscores the importance of digital onboarding infrastructure and the gradual realization of network expansion benefits.

b. Profitability (NIM and ROA)

The effects on profitability are asymmetrical across indicators. Return on Assets (ROA) does not exhibit a statistically significant change in the overall ATT. However, event-time estimates indicate a significant and positive impact beginning in the first year post-treatment and persisting into the second year. This delayed improvement likely reflects initial synergy gains through enhanced non-interest income or asset optimization, which are insufficient to shift the average effect over the entire post-treatment window.

Conversely, Net Interest Margin (NIM) declines significantly in the first year after acquisition, likely due to short-term integration costs and pressure on lending spreads. Nonetheless, a partial recovery is observed in the second year, although not at conventional significance levels. These findings highlight the temporal sensitivity of intermediation performance to structural transitions in business models.

### c. Operational Efficiency (BOPO)

The Operating Expenses to Operating Income Ratio (BOPO) shows no consistent improvement post-acquisition. On the contrary, the second year after acquisition is associated with a statistically significant increase in BOPO, implying that digital investments and integration-related fixed costs outweigh early efficiency gains. This suggests that cost rationalization may require a longer post-integration horizon to manifest. The insignificant change in BOPO suggests that operational efficiency gains may require longer adjustment periods and deeper post-acquisition integration. While ROA improved in the first year, such gains may reflect short-term synergies rather than sustainable performance, highlighting the importance of post-M&A alignment and organizational learning in capturing long-term value.

The findings suggest that fintech-led bank acquisitions primarily drive market expansion, notably through account growth, while improvements in profitability and efficiency are not immediate. This is consistent with Murende et al. (2022) and Akhtar & Nosheen (2022), who highlight the role of digital platforms in promoting financial inclusion but caution that strategic integration and scalability are essential for realizing full value. Mixed results on profitability reflect concerns raised by Zheng and Mao (2024) and Bikker (2010) regarding inflated synergy expectations and hidden integration costs. The minimal impact on ROA and the decline in NIM support the idea that technology-driven mergers involve transitional costs before benefits emerge, as also noted by Cornett et al. (2021). The continued rise in BOPO aligns with findings from Cornett et al. (2016) and Kai and Sim (2016), who identify post-merger frictions—such as tech misalignment and internal resistance—as key barriers to efficiency gains.

Theoretically, these results contribute to the SCP paradigm by showing that structural changes alone do not guarantee improved performance; effective integration and technology management are crucial. Within platform economics, the study emphasizes the role of network effects and delayed adoption, where profitability and efficiency depend on organizational readiness and platform fit. In conclusion, this research provides empirical insights into fintech-led M&A in a regulated emerging market, extending SCP and platform economics by highlighting the staggered and context-specific nature of digital transformation.

### Policy and Strategic Implications

The findings of this study yield several important implications for financial sector regulators, policymakers, and banking industry stakeholders engaged in digital consolidation. Given that most fintech acquisitions were initiated to meet core capital requirements, policy responses must go beyond facilitating transactional compliance and ensure effective post-acquisition integration and oversight.

#### 1. Strengthening an Integrated Regulatory Sandbox for Digital Ecosystems

The analysis shows that post-acquisition profitability has not improved consistently, and Net Interest Margin (NIM) in particular declines significantly in the first year following acquisition. This suggests that digital integration presents structural and transitional challenges that can depress short-term financial performance.

Currently, the use of regulatory sandboxes in Indonesia remains fragmented across regulatory authorities. Therefore, Bank Indonesia and the Financial Services Authority (OJK) should consider developing an integrated regulatory sandbox framework specifically designed for post-acquisition digital banks. Such a framework would:

- Facilitate controlled experimentation with post-acquisition digital products and business models,
- Enable structured monitoring of organizational readiness for digital transformation,
- Allow the application of prudential oversight principles adapted to the stage of post-merger integration.

## 2. Establishing a Post-Merger Integration Oversight Framework (M&A Desk)

The absence of significant improvements in both profitability and operational efficiency suggests that post-merger integration at the managerial and operational levels has been suboptimal. To address this gap, regulators should institutionalize a post-merger integration oversight mechanism, possibly through a specialized M&A desk, with the objective of strengthening early detection and supervisory responsiveness. Key elements of this framework should include:

- Detailed integration roadmaps across core functional areas (IT, human resources, finance, risk),
- Definition of measurable post-merger performance indicators,
- Mandatory periodic reporting during the 2–3 year transition window.

## 3. Risk-Based and Systemic Supervision for Digitally Consolidated Banks

Given that most acquisitions target KBMI 1 banks and involve fintech firms with broad digital ecosystems, there is an emerging potential for unclassified systemic risk that is not yet captured by conventional supervisory frameworks. Accordingly, regulators should adopt a more adaptive, risk-based supervisory approach to monitor post-acquisition developments within digital ecosystems. Policy measures could include:

- Temporary classification of newly acquired banks under enhanced supervisory scrutiny throughout the integration period,
- Regular post-merger stress testing to assess financial and operational resilience,
- Ongoing assessment of cross-entity exposures and interlinkages within the broader fintech platform network.

## CONCLUSION AND SUGGESTION

This study examines the impact of fintech acquisitions on the performance of conventional banks in Indonesia from 2017 to 2024, utilizing a staggered Difference-in-Differences (DiD) approach with a double-robust estimator (did2s). Performance is assessed across four dimensions: market access (number of bank accounts), profitability (NIM and ROA), and efficiency (BOPO).

The findings reveal that fintech-led acquisitions foster market expansion, evidenced by a significant rise in bank accounts beginning in the second year post-acquisition. Profitability outcomes are mixed—ROA shows initial improvement but lacks consistent significance, while NIM declines early in the integration phase. Efficiency, measured by BOPO, shows no significant gains, indicating that cost optimization requires longer adjustment periods and higher organizational readiness.

Empirically, this study contributes to M&A literature in emerging markets by showing that acquisition outcomes are strongly influenced by institutional capacity and post-merger strategy. Theoretically, it extends the SCP and platform economics frameworks by highlighting the importance of timing, asymmetry of effects, and the challenges of digital integration across firms.

From a policy perspective, the study underscores the importance of an integrated post-acquisition sandbox, mandatory oversight (e.g., an M&A Desk), and a risk-based supervisory framework adapted to digital ecosystems. These recommendations aim to support the development of inclusive and sustainable consolidation strategies.

Despite its robust causal framework, several limitations are acknowledged. First, the 2017–2024 timeframe may be insufficient to capture long-term effects on profitability and efficiency. Second, although the model includes time-varying covariates, potential omitted variable bias from external factors—such as sectoral competition, digital adoption trends, or macroeconomic

shocks—remains. Third, the study does not differentiate acquiring fintechs by characteristics (e.g., platform model, ownership structure), which may shape the integration process.

Future research should extend the observation period to assess long-term impacts on banking transformation and stability. Mixed-method approaches—combining econometric analysis with qualitative case studies—could offer richer insights into organizational and cultural dynamics.

Moreover, exploring heterogeneity through stratified analysis or machine learning-based causal inference may uncover deeper variation in outcomes. Finally, cross-country comparative studies would help identify how regulatory and market differences influence integration success in fintech-driven bank M&As

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