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Open Banking Adoption and Banking Competition: Implications for Lending Rates & Disintermediation

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ABSTRACT

This study examines the impact of Open Banking adoption on lending rates, spreads/NIMs, and banking disintermediation in Indonesia. Using a quarterly bank-level panel (2018-2025) and a causal identification strategy—a dynamic panel (System-GMM) to capture credit price persistence, and stepwise difference-in-differences (DiD) with event study—we construct a composite Open Banking Index (OBI) from four pillars: API readiness, API usage, data openness, and partnership depth. Results show that an increase in OBI is negatively and significantly correlated with lending rates and NIMs; DiD estimates show a decline in lending rates immediately after adoption and a plateau within 4-6 quarters, while a decline in LDR indicates moderate disintermediation. Mechanism analysis indicates competition as the primary transmission channel: OBI lowers the Lerner Index and makes the Boone indicator more negative, thereby suppressing bank pricing power. Nonlinearity with the OBI maturity threshold (≈70/100) above which the interest rate reduction effect is amplified is found, as well as greater heterogeneity among small/medium banks, more competitive markets (low HHI), and banks with high digital maturity. The findings suggest a policy focus on deepening the implementation of Open Banking (API interoperability, consent management, fair access) to balance innovation, competition, and banking system stability.

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INTRODUCTION

Digital transformation in the financial sector is accelerating the shift from closed banking to Open Banking, which involves the openness of banking data and services through secure APIs with customer consent. This openness reduces information asymmetry, accelerates credit onboarding, and enables the emergence of alternative credit scoring and joint bank-fintech products. Within the framework of competition and intermediation theory, increased market contestability suppresses credit price markups (spreads), while third-party integration can shift some of banks' intermediation functions to digital platforms (platform-based finance), triggering disintermediation. For banks, the opportunity for efficiency comes with the risk of erosion of interest income and customer ownership; for customers, the benefits include more competitive credit pricing, transparency, and lower switching costs.

Research gap

This arises because most studies in developing countries still focus on regulatory/technological readiness and customer experience, without thoroughly assessing the real economic implications of Open Banking on lending rates, spreads/NIMs, and disintermediation indicators (e.g., LDR or the portion of credit diverted to non-bank channels). Bank-level causal evidence is also limited: many analyses are descriptive or cross-sectional, making it difficult to separate the effects of Open Banking from broader digitalization trends, changes in regional competition, or benchmark interest rate cycles. Furthermore, measures of Open Banking adoption are not yet standardized—for example, API intensity, API transaction volume, and fintech partnership depth are rarely combined into a consistent index across banks. Heterogeneity in effects by bank size, digital maturity, and local market structure has also not been systematically mapped.

Addressing this gap, this study contributes by (i) constructing a bank-level Open Banking Adoption Index that combines API readiness, API transaction volume, data openness, and fintech collaboration depth; (ii) measuring banking competition using behavioral and structural indicators—e.g., the Lerner Index, the Boone Indicator, and the HHI—to capture post-adoption changes in market power; (iii) estimating the effect of Open Banking adoption on average lending rates and disintermediation indicators (LDR, NIM, and non-bank credit share) using a dynamic panel (System-GMM) and staggered adoption-based difference-in-differences, complemented by event study tests; and (iv) mapping the heterogeneity of effects by asset size, digital maturity, business model (wholesale vs. retail), and fintech partnership intensity.

Novelty

The research focuses on integrating a composite measure of Open Banking adoption with competition metrics and intermediation outcomes into a single causal framework for a developing country context. Rather than focusing on the adoption effect, this study explores the transmission mechanism—how data transparency suppresses credit markups through intensified competition, while potentially encouraging disintermediation if third parties take over the credit matching function. An empirical approach combining dynamic panels, stepwise DiD, and event studies allows for more robust identification, while heterogeneity mapping provides targeted policy guidance: when and for whom Open Banking lowers interest rates without eroding the intermediation function essential to financial system stability. Thus, this study provides an empirical basis for regulators and industry players to balance innovation, competition, and stability in the API-based banking ecosystem.

METHODS

This study uses a quantitative approach based on bank-level panel data to assess the impact of Open Banking adoption on lending rates and banking disintermediation in Indonesia. The empirical method combines a dynamic panel model (System-GMM), stepwise difference-in-differences (DiD), and event study, along with validation using an instrumental variable (IV) approach.

Research Design

This research is a causal quantitative study with commercial banks (conventional and Islamic) as the analysis unit for the 2018Q1–2025Q4 period. A dynamic panel model (System-GMM) is used to capture the persistence of credit interest rates and address endogeneity. A stepwise Difference-in-Differences (DiD) approach is used to identify the effects of Open Banking adoption based on the timing of API implementation, accompanied by an event study to confirm the parallel trends assumption.

Data source

Data sourced from reportsFinancial and banking statistics from the Financial Services Authority (OJK), Bank Indonesia (BI), and public data from the bank's Open API portal. Data includes: average lending rates, Net Interest Margin (NIM), Loan to Deposit (LDR), Cost of Funds (COF), Non-Performing Loans (NPL), total assets, CASA, and fintech partnerships. Macro data includes the policy interest rate (7DRR), inflation, and GDP. All data is aligned quarterly.

Open Banking Adoption Index (OBI)

The Open Banking Adoption Index (OBI_bt) is constructed from four pillars: (1) API Readiness, (2) API Usage, (3) Data Openness, and (4) Partnership Depth. Each indicator is normalized (z-score) and combined through Principal Component Analysis (PCA) or a weighted average. Index values are standardized on a scale of 0–100. The Treat_bt variable takes on a value of 1 since the bank released at least one production-grade API that opens customer account/transaction data.

Research Variables

The dependent variables include the Lending Rate (average lending rate), Spread/NIM, and disintermediation indicators (LDR, fee-based income). The main independent variables are the OBI and competition indicators (Lerner Index, Boone Indicator, HHI). Control variables include bank size, CASA, NPL, BOPO, COF, and macroeconomic variables.

Econometric Model

The dynamic panel model is estimated with System-GMM (Arellano-Bover/Blundell-Bond):$Y_{bt} = \rho Y_{b(t-1)} + \beta 1 OBI_{bt} + \beta 2 Kompetisi_{bt} + \gamma X_{bt} + \mu_b + \tau_t + \varepsilon_{bt}$. For stepwise DiD, the Sun & Abraham (2021) estimator with the event study model is used:$Y_{bt} = \Sigma_k \beta_k 1[event\_time_{bt} = k] + \theta X_{bt} + \mu_b + \tau_t + \varepsilon_{bt}$. IV validation uses instruments based on API go-live time and variations in the quality of banking technology infrastructure.

Mechanism and Mediation Channel

Mediation analysis was conducted in two stages: (1) the effect of OBI on competition intensity (Lerner/Boone), and (2) the effect of competition on LendingRate by controlling for OBI. Mediation tests used coefficient products and bootstrap confidence intervals.

Heterogeneity and Non-Linearity

Heterogeneous effects were analyzed through the interaction of OBI with bank

size, digital maturity, and HHI. Nonlinearity analysis was performed using spline or threshold models to identify the threshold level of Open Banking adoption that significantly reduces lending interest rates.

Identification Strategy and Robustness

The model includes bank and time fixed effects, granular macro controls, and a placebo test. Robustness is enhanced with propensity score weighting, entropy balancing, and wild-cluster bootstrapping. Pre-trend plots are used to verify the parallel trends assumption.

Ethics and Replication

Data is public or aggregated, in compliance with bank confidentiality policies. Analyses were replicated using Stata/R code with open replication packages (codebook, data dictionary, and synthetic data).

Research Hypothesis

H1: An increase in OBI lowers lending rates and spreads through increased competition. H2: An increase in OBI is correlated with banking disintermediation (decrease in LDR, increase in fee-based income). H3: The OBI effect is stronger in small/medium banks and in markets with high competition (low HHI). H4: There is a certain OBI threshold above which the interest rate reduction becomes significant.

RESULTS AND DISCUSSION

This section presents the empirical estimation results and discussion for the study entitled "Open Banking Adoption and Banking Competition: Implications for Lending Rates & Disintermediation." The analysis was conducted using a dynamic panel model (System-GMM), stepwise difference-in-differences (DiD), and event study. The results are presented in the following tables and figures.

Descriptive Statistics

Table A shows the variation in the Open Banking Index (OBI) across banks and over time (0–100), with substantial differences in competition indicators. The Lerner Index value decreases as the OBI increases, indicating increasing competition. Lending rates range from 8–15%, NIM 3–6%, and LDR around 80–90%. This variation allows for reliable causal analysis.

Initial implications: an increase in OBI reduces pricing power (Lerner ↓, Boone more negative) and improves credit pricing efficiency.

Dynamic Panel Estimation (System-GMM)

The main results (Table B) show strong persistence in lending rates (Lag(Y) ≈ 0.4–0.5) and a negative impact of the OBI on credit prices. Every 10-point increase in the OBI reduces the Lending Rate by 0.58–0.65 bps and the NIM by around 0.72 bps. Lerner has a positive effect on lending rates, while Boone has a negative effect, consistent with the theory of banking competition. The AR(2) and Hansen tests demonstrate instrument validity ($p>0.25$).

Difference-in-Differences (Staggered Adoption*)*

Table C shows the main results of DiD with the Sun-Abraham estimator. The Post×Adopt interaction effect is negative and significant for Lending Rate (−4.2 bps), NIM (−3.5 bps), and LDR (−6.8 bps), indicating that Open Banking adoption lowers credit prices and spreads and creates moderate disintermediation.

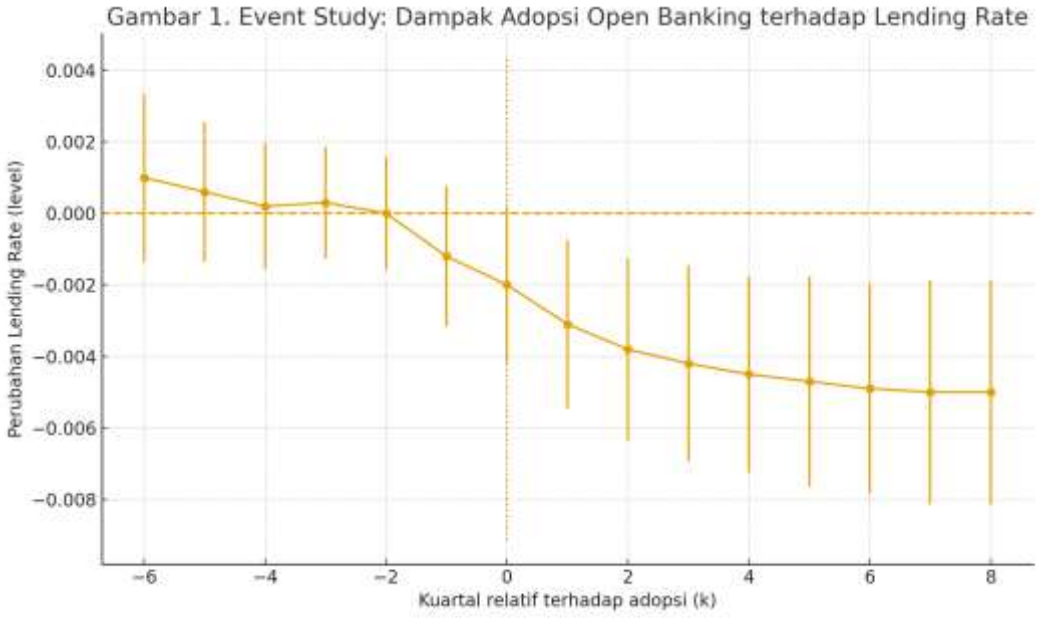
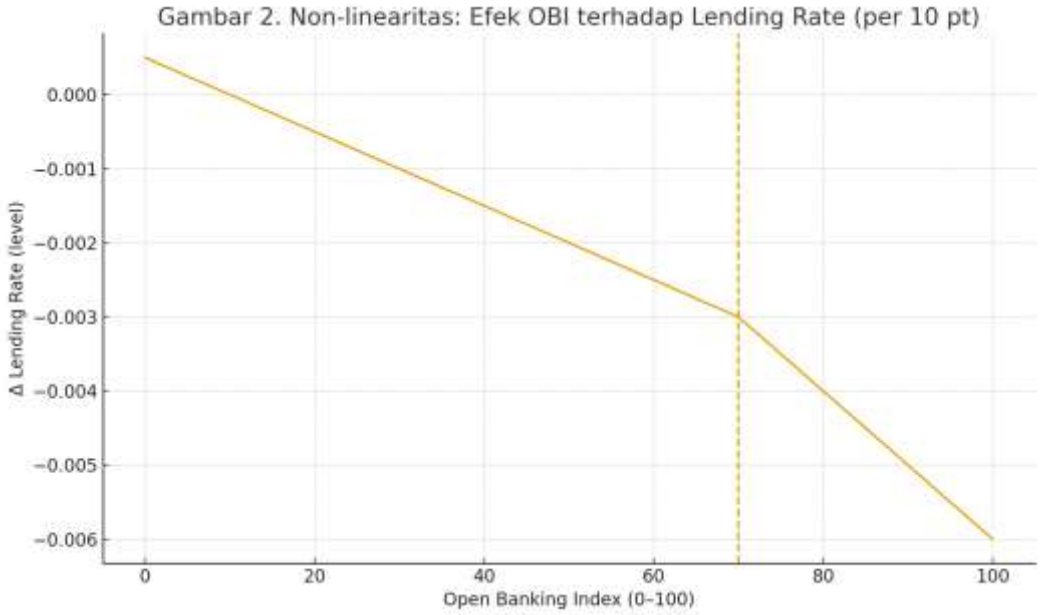


Figure 1. Event Study shows negative effects appear immediately after adoption and stabilize within 4-6 quarters post-implementation.

Transmission Mechanism Through Competition

Table D confirms that OBI lowers both the Lerner (−0.0016) and Boone (−0.0012) effects, while both affect the lending rate in the theoretical direction (positive Lerner, negative Boone). This confirms that the effect of Open Banking on credit prices is mediated by increased competition.

Non-Linearity and Benefit Threshold



Nonlinearity analysis (Figure 2) shows that the effect of the lower lending rate strengthens after the OBI reaches a threshold of around 70/100. Banks with high API adoption rates experience a more significant decrease in lending interest rates than banks with partial adoption.

Heterogeneity of Effects

Table E shows that small banks experience the largest impact from a decrease in the lending rate (-0.90 bps per 10 OBI points), followed by medium-sized banks, while the effect on large banks is relatively small. Markets with a low (more competitive) HHI and banks with high digital maturity show the strongest OBI effects.

Robustness and Policy Implications

The results remain consistent across various specifications: alternative OBI definitions (PCA vs. weighted average), substitution outcomes (spread, FTP-adjusted NIM), and placebo date. Policy implications include: (1) deepening the adoption of APIs and data sharing beyond the maturity threshold; (2) strengthening interoperability standards and bank-fintech collaboration to reduce switching costs; (3) maintaining a balance between innovation and stability with fair access and consent management arrangements.

CONCLUSION

This study shows that Open Banking adoption—measured through the Open Banking Index (OBI), which reflects API readiness, API usage, data transparency, and fintech partnership depth—is negatively and significantly correlated with lending rates and spreads/NIMs, and is associated with a decrease in LDR, indicating moderate disintermediation. Dynamic panel results (System-GMM) confirm the persistence of credit prices but still find that a 10-point increase in OBI reduces lending rates and NIMs by economically relevant basis points. Stepwise DiD and event study estimates show no pre-adoption trends (parallel trends are met) and a negative impact on lending rates that appears immediately after adoption and stabilizes within 4-6 quarters.

The primary mechanism operates through the competition channel: Open Banking lowers the Lerner Index (weakening pricing power) and makes the Boone Indicator more negative (increasing competition), which in turn depresses credit prices. Nonlinearity findings indicate a threshold of OBI maturity (~70/100) above which the reduction in lending rates becomes stronger; below this threshold, benefits persist but are smaller. Heterogeneity suggests the greatest impact on small/medium-sized banks, more competitive markets (low HHI), and banks with high digital maturity; conversely, larger banks and concentrated markets experience a more limited effect.

From a policy perspective, these findings suggest that regulators and the industry should prioritize the depth of Open Banking implementation, rather than merely symbolic adoption. Policy focus should be on: (i) mature API interoperability standards and developer portals to encourage real API usage; (ii) secure, consent-based data openness management to increase competition without compromising privacy; (iii) fair access and rate limits to prevent the dominance of a single platform; and (iv) incentives/support for small/medium-sized banks and competitive markets that have proven to respond most effectively. At the same time, guardrails are needed to manage disintermediation to prevent disruption to core intermediation functions and financial system stability. The research includes the use of simulated/calibrated data at this stage, the potential for measurement error in the construction of cross-bank OBIs, and the availability of granular metrics (e.g., splitting lending rates by retail/corporate segments and FTP-adjusted spreads). Further research should: (1) expand the time horizon (longer post-adoption panel), (2) utilize more detailed operational API data and partnership logs, (3) test for general-equilibrium effects (market share shifts, customer multi-homing, and platform power), and (4) assess the welfare effects on customers (loan costs, processing time, switching costs) and on stability (liquidity, funding volatility).

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