

Open Banking and Bank M&A Activity: Global Evidence

Abstract

Open banking (OB) reallocates control over transaction data to consumers and standardizes access through APIs, altering competitive advantages in retail finance. We examine how OB reshapes the market for bank mergers and acquisitions (M&As). Exploiting the staggered introduction of OB across countries and a stacked-cohort difference-in-differences design, we document that banks exposed to OB conduct consolidation activity, with a composition shift toward domestic, within-industry transactions consistent with capability scaling and data stewardship. OB-era bank acquisitions by exposed acquirers are value creating, as reflected in positive announcement returns and sustained post-deal performance improvements. Operating outcomes also strengthen following deal completion, indicating that interoperability and standardized data access facilitate integration of screening, monitoring, and distribution. At the same time, market-level indicators point to a more concentrated market structure and greater pricing power, highlighting policy trade-offs between dynamic efficiency and static competition. Our findings suggest that OB not only invites entry and innovation but also reorganizes incumbents through consolidation.

JEL: G21, G34, L51

Keywords: Open Banking; Bank M&A; Capability Scaling

1 Introduction

Open banking (OB), the regulatory initiative that grants consumers ownership over their financial transaction data and the requirement for banks to share financial consumer data securely with authorized third parties, is reshaping the industrial organization of financial services. By lowering data portability frictions and standardizing access through application programming interfaces (APIs), OB reduces entry barriers for technology-enabled challengers and forces incumbent banks to rethink how they create and capture value.¹ A first-order question in this new OB environment is how banks reorganize to remain competitive when proprietary informational moats erode. Mergers and acquisitions (M&As) represent a natural strategic response: Bank acquisitions can achieve economies of scale in data processing, accelerate the building of organizational capabilities and consolidate complementary assets such as payments, digital channels, and analytics talent. Yet, *ex ante*, it is unclear whether OB catalyzes more bank consolidation, whether such deals create value for bank shareholders, and along which margins the real effects unfold.

In this study, we provide the first global evidence that the introduction of mandatory OB materially increases banks' M&A activity and enhances the value and real outcomes of those deals. We assemble a panel of publicly listed acquirer banks in 63 countries from 2013 to 2023. Exploiting the staggered adoption of OB across countries as a plausibly exogenous shock to banks' data rights and competitive exposure, we implement a stacked-cohort difference-in-differences (DiDs) framework that absorbs cohort-by-year shocks and cohort-by-bank fixed effects (e.g., [Gormley and Matsa, 2011](#); [Cengiz et al., 2019](#); [Deshpande and Li, 2019](#)). We show that banks headquartered in jurisdictions that adopt OB subsequently undertake significantly more M&A activities. We further document that the post-OB M&A deals undertaken by treated banks generate positive M&A deal announcement returns and large post-deal long-run abnormal returns, and are followed by meaningful improvements in

¹OB regimes such as the UK's post-CMA remedies, the European Union's PSD2, Australia's Consumer Data Right, Brazil's Open Finance, and the U.S. CFPB's Section 1033 rule have lowered portability frictions and encouraged data-driven product design.

profitability and lending growth. At the same time, we uncover adverse competitive spillovers at the market level. In stimulating greater consolidation within the banking sector, mandatory OB adoption is associated with slower growth in the number of active banks and higher pricing power (measured by Lerner index) in their home markets. Our results reveal that OB reconfigures the industrial structure of the banking sector not only through inviting new entrants but also by triggering incumbent consolidation that creates value for acquirers while raising salient policy trade-offs for competition and consumer welfare.

Theoretically speaking, OB has ambiguous implications for bank competition and investment (e.g., [He et al., 2023](#)). When transaction data are proprietary, dominant banks enjoy an informational advantage that enables superior screening, customizing and pricing financial products or services ([Hauswald and Marquez, 2006](#); [Gan and Riddiough, 2008](#); [Norden and Weber, 2010](#); [Schenone, 2010](#); [Berger et al., 2017](#)). OB reduces these proprietary advantages by allowing authorized third parties to access customers’ bank accounts and payments data with their consent. If OB mostly empowers new entrants whose algorithms can convert data access into a game-changing information advantage and enhanced predictive super-power, competition should intensify and profit margins should compress. However, when a subset of large incumbent banks can best leverage both data access and organization capital (e.g., by combining robust compliance, brand, customer relationships, and scaled data infrastructure), OB may perversely amplify returns to size, drive capability-seeking acquisitions, and consolidate market power. Which of these opposing forces will dominate under an OB regime is ultimately an empirical question and hinges on how banks strategically adjust their boundaries when data portability becomes a regulatory right rather than a bilateral privilege.

We assemble a novel global panel dataset that links bank-level M&A to country-level OB rollouts. Our treatment indicator flags banks headquartered in countries that adopt binding OB mandates, and our main outcomes are bank-year measures of M&A deal counts and deal values. The econometric design follows a stacked-cohort DiD specification suited

to staggered policy timing, with cohort-by-bank and cohort-by-year fixed effects and rich lagged controls at the bank and country levels. Event-time regressions confirm parallel pre-trends in both deal counts and deal values, with the treatment effect emerging in the OB announcement year and peaking around the second post-announcement year. On average, OB increases treated banks’ deal counts by about 44% and aggregate deal values by approximately 39% relative to the respective sample means, indicating an economically significant intensification of banking sector consolidation. Consistent with OB lowering the costs of integrating data architectures and regulatory interfaces within shared regimes, the effects are concentrated in domestic, within-financial-industry combinations rather than cross-border or cross-industry transactions. These patterns suggest that OB pushes banks toward scale and scope rationalization in the core of financial intermediation rather than diversification into unfamiliar sectors. In the cross-section, our results reveal that increases in deal activity are more pronounced for acquirer banks with larger size and higher brand value, and for countries with higher levels of financial inclusion and digital payment adoption, consistent with a capability-scaling and data-stewardship rationale.

To evaluate whether the OB-induced M&A creates value, we analyze deal announcement cumulative abnormal returns (CARs) and long-horizon buy-and-hold abnormal returns (BHARs). Treated acquirers (i.e., those subject to OB mandates), relative to control acquirers, experience higher five-day CARs by approximately 1.2 to 1.5 percentage points around deal announcements, implying that market investors anticipate value-enhancing synergies in the new regulatory landscape. Strikingly, these deals also deliver persistent long-term gains: one- and three-year BHARs are about 11 to 12 percentage points and 45 to 48 percentage points higher, respectively. These magnitudes are substantial in light of the typical under-performance of acquirers documented in the general M&A literature, and they indicate that the market’s initial optimism is borne out in operating results rather than merely reflecting contemporaneous sentiment.

We then open the black box of post-merger real effects. Using bank-level operating

data, we show that treated acquirers improve profitability after acquisitions, with return on assets rising in the three years following deal completion. We also document strategic expansion on the asset side: loan growth is materially higher for treated acquirers in the three years after their deals, consistent with OB-enabled bank consolidation supporting scalable origination and cross-platform distribution. These real operating performance improvements align with mechanisms in which OB raises the value of combining complementary data assets, technology stacks, and distribution networks, and profit margin of incumbents improves when data standards are mandated and APIs are institutionalized.

Finally, we examine competition in the home lending markets of treated banks. While OB can reduce information frictions for new entrants, our evidence indicates that the consolidation response by incumbents may countervail these pro-competitive forces. Specifically, we find that the growth rate of the number of active banks declines and local Lerner indices increase materially by roughly 4 to 6 percentage points, in the subsequent three years following OB adoption. These market-level outcomes highlight a potential policy trade-off: OB can spur innovation and reallocation, but if the equilibrium response of well-positioned incumbents is to scale up via acquisition, the resulting market structure may feature fewer competitors and greater pricing power, potentially harming borrower welfare.

In summary, by leveraging the global staggered rollout of OB and detailed bank-, deal-, and market-level data, we document a robust, economically meaningful increase in bank consolidation after OB adoption, accompanied by positive value creation and real outcomes for acquirers and nontrivial shifts in market structure. These new findings reframe the conversation about OB from one focused solely on market entry and consumer switching to one that emphasizes incumbents' strategic reorganization and the resulting industry equilibrium that reduces consumer welfare. The evidence points to a world in which data-rights regulation is a powerful determinant of firm boundaries in banking and calls for future research on how complementary policies can harness OB's innovative potential while safeguarding competition and consumer welfare.

This study contributes to several strands of literature. First, we add to the emerging OB literature by shifting the focus from fintech entry and bank API adoption to the strategic firm-boundary response among banks through M&A. Prior work suggests that data access via OB can, in some environments, soften price competition if it widens capability gaps between lenders and induces winner’s-curse dynamics (He et al., 2023). Prior studies further show that OB and related data-rights policies spur fintech VC investment and reduce consumer search and switching frictions (Babina et al., 2025), and that large banks are early and intensive API adopters (Lin et al., 2024). We show that, in the market for corporate control, OB catalyzes a distinct consolidation channel: banks strategically expand their reach through acquisitions in response to heightened data openness.

Second, we contribute to the bank M&A literature ² by identifying a regulatory shock, the introduction of OB, that both stimulates acquisition deal activity and is associated with positive value creation for bank acquirers, measured in the short run by deal announcement returns and in the long run by BHARs and profitability measures.

Third, we speak to the debates about competition and consumer welfare under digital transformation (e.g., Jones and Tonetti, 2020; Parlour et al., 2022). While OB is often framed as pro-competitive, our findings suggest that incumbent adaptation via consolidation can partially offset entry-induced competition, an equilibrium outcome that regulators should consider when evaluating the aggregate impact on market power and pricing.

Our study has policy implications. If the adoption of OB is to achieve the dual goals of innovation and competition, authorities may need to complement data-rights mandates with merger policy that recognizes the heightened strategic value of scale under standardized data access. Importantly, the concentration of effects in domestic, within-industry deals implies that the largest implications for market structure will materialize locally rather than through cross-border expansions. Moreover, the strong long-run performance of OB-era acquisitions suggests that, from the acquirer’s perspective, these deals are not merely defensive but reflect

²e.g., see DeYoung et al. (2009) for a review

genuine efficiency gains in integrating data, technology, and distribution. A nuanced policy approach might therefore weigh dynamic efficiency benefits against static competition losses, potentially tailoring merger review to the specific OB implementation stage, API standard maturity, and the competitive conditions of local lending markets. To our best knowledge, we provide the first global study into how mandated data sharing through OB adoption spurs financial consolidation and has the unintended consequences of reducing banking competition and consumer welfare.

2 Hypotheses Development

Open banking (OB) reallocates control over transaction data to consumers and standardizes access through secure APIs. This change lowers data portability frictions, reduces onboarding costs between institutions, and enables authorized third parties to reuse granular account and payments information for screening, monitoring, and personalization. In credit markets, broader access to high-frequency account-level transaction data increases the return to analytic scale and to the stewardship of consented data. As the marginal value of each additional record, feature store, and distribution node rises with the capability of the system that processes it, banks face an opportunity to reoptimize firm boundaries. A pure entry view emphasizes greater contestability and switching as new entrants exploit consented data (Babina et al., 2025). In contrast, a capability view holds that well-positioned incumbents are best able to integrate data assets, model pipelines, compliance, and distribution, thereby raising the returns to capability-seeking acquisitions (Lin et al., 2024). Models of competition with borrower-owned data also show that changes in relative screening ability can reshape strategic interaction across lenders (He et al., 2023). These considerations motivate three testable hypotheses that map directly to our empirical design.

We first investigate whether OB triggers a reorganization of incumbents through the market for corporate control. By standardizing interoperability and accreditation, OB low-

ers the fixed and coordination costs of stitching together data and workflows under a common regime. As these data frictions fall, the marginal benefit of combining data schemas, consent management, model governance, and distribution within a single firm rises. If OB increases the returns to scaled data engineering and stewardship, exposed incumbent banks may exhibit greater consolidation, reflected in more acquisition deals and higher aggregate deal values.

H1. *Following open-banking adoption, exposed banks undertake more mergers and acquisitions and complete transactions with greater aggregate value than unexposed banks.*

This OB-triggered reorganization implies systematic heterogeneity. Returns to scale in data pipelines and distribution are larger when acquirers already have substantial customer bases and brand capital, and when the surrounding ecosystem produces richer transaction data (e.g., widespread use of digital payments). In countries with higher financial inclusion and greater digital-payments adoption, the informational content and frequency of consented data flows further amplify the value of integration. Under a capability-scaling and data-stewardship rationale, OB should therefore induce stronger consolidation by bank acquirers with greater ex-ante capacity to process and monetize data, and in environments where the data are most informative.

H2. *The OB-induced increase in acquisition activity is stronger for larger, higher-brand-value bank acquirers and in countries with higher levels of financial inclusion and digital-payments adoption.*

If OB increases the strategic value of combining complementary data assets, engineering capacity, and distribution, then acquisitions undertaken by exposed bank acquirers in the OB era should create value. Market investors should anticipate synergies in loan processing capacity, risk segmentation, personalization, and approval speed under interoperable standards, and those expectations should be borne out in realized operating performance. This prediction links OB adoption to classic evidence on merger gains in banking, where value improvements arise when combinations unlock efficiency and scope rather than rely solely

on market power (e.g. see [DeYoung et al. \(2009\)](#)).

H3. *Relative to unexposed acquirers, exposed acquirers experience higher announcement returns and more positive post-deal-completion abnormal returns around OB-era acquisitions, followed by subsequent improvements in operating performance.*

Taken together, these hypotheses describe a coherent mechanism. OB lowers data-portability frictions and broadens contestability, yet it simultaneously raises the returns to scaled data stewardship within capable incumbent banks. Exposed incumbents respond with capability-seeking consolidation, and the response is strongest where acquirers possess greater brand capital and scale and where the surrounding ecosystem generates high-frequency, information-rich payments data. Under this mechanism, equity markets should recognize value creation at M&A deal announcement, and subsequent operating performance should reveal persistent synergy gains.

3 Institutional Background and Sample Construction

3.1 Open Banking Around the World

Open banking (OB) refers to a framework under which banks, at a customer’s request, must provide other authorized financial service providers secure access to that customer’s account data as the data is primarily owned by the customers. These authorized third parties include both incumbent financial institutions and FinTech firms ([Juneja et al., 2024](#)). Data sharing typically occurs through standardized Application Programming Interfaces (APIs) that allow these institutions to retrieve not only account balances as in traditional credit bureau systems but also detailed transaction-level information such as dates, amounts, merchants, and descriptions that empowers advanced machine learning algorithms.

Although institutional designs vary across jurisdictions, the primary policy objective is to promote competition and innovation in retail financial markets and potentially the small-to-medium enterprises (SMEs) financing. By lowering informational barriers and requiring

incumbent banks to share customer data, regulators seek to reduce switching costs, foster market new entry, and improve pricing efficiency. The underlying rationale is that when customers can take seamlessly share their financial data, new entrants can design products and services that compete more effectively with established incumbents, eroding information-based monopolies.

Globally, OB adoption follows two broad paths: (i) *regulation-led* initiatives that legally mandate data sharing, and (ii) *market-driven* initiatives where banks and fintechs voluntarily adopt open-data frameworks. Our study focuses on the mandatory and regulation-led regimes that are enforceable by law and require incumbent banks to provide standardized API access to authorized third parties. Without such enforceable provisions, banks have little incentive to share proprietary customer data with potential competitors. Specifically, our identification strategy relies on the exogenous imposition of open banking regulations, which legally require banks to share proprietary customer data with potential competitors. This policy represents a significant negative shock to the banks’ informational monopoly, creating a forced-sharing environment that would not have occurred in an unregulated equilibrium. We use this regulatory shock to isolate how banks strategically adjust their business practices in response to this legislated increase in competition, particularly through banks M&A activities decision-making.

We compile a global novel and comprehensive dataset of mandatory OB policies across 48 jurisdictions. Table 1 reports the regulation announcement year, the data-sharing enforcement year, the legal source and the issuing authority for each country in details. The United Kingdom (UK) was the pioneer of the OB reform. The Competition and Markets Authority (CMA) in UK concluded the Retail Banking Market Investigation in 2016 and mandated the open banking regulation in 2017 ³. This framework seeks to reduce concentration in retail banking and stimulate FinTech competition (CMA, 2016). In the European Union, the Second Payment Services Directive (PSD2) requires all payment-account providers to

³We use 2016 as the treatment year of the UK as the information is disseminated during the Retail Banking Market Investigation. But 2017 is used in a robustness check and the baseline results still hold.

grant third-party providers access to account and payment data with customer consent and was transposed by member states to national laws by 2018 and transposed by European economic areas by 2019.

[Insert Table 1 about here]

This regulatory innovation diffused globally, revealing a stark contrast in adoption patterns between developed and emerging markets as shown in Figure 1. Developed jurisdictions often leveraged existing robust legal and financial infrastructures to implement complex data-sharing regimes, as seen in Canada’s advisory-led path and South Korea’s integration with its advanced electronic finance ecosystem. Conversely, many emerging markets, including India, Brazil, and Mexico, have strategically deployed open banking not merely to enhance competition but as a foundational tool for financial inclusion and development of their financial systems. For instance, India’s India Stack integrates digital identification (Aadhaar), payment infrastructure (UPI), and a consent-based data-sharing layer (Account Aggregators), enable Indian individuals and firms to share verified financial information across institutions. This infrastructure-driven model illustrates how open banking can be embedded within broader digital public systems (Juneja et al., 2024).

In sum, OB represents a shift from institution-centric to customer-centric data governance (He et al., 2023). Despite heterogeneity across jurisdictions, the core principle is uniform: customers own their financial data and may authorize its use to promote competition, innovation, and inclusion. This staggered and heterogeneous adoption of OB regulations provides a natural laboratory to examine how data-sharing mandates reshape banking competition and merger activity across countries.

3.2 Sample Construction

3.2.1 Baseline Sample Construction

To estimate the effect of OB regulations on bank merger and acquisition (M&A) activity, we integrate multiple datasets. Information on M&A transactions is obtained from the LSEG (formerly Refinitiv) SDC Platinum database. Bank-level financial characteristics and stock returns are obtained from Compustat North America and Compustat Global. Country-level macroeconomic variables are drawn from the World Bank and the International Monetary Fund (IMF). OB regulation information is hand-collected and compiled from official legislative documents and verified industry sources as summarized in Table 1.

OB regulations are adopted in a staggered manner between 2016 and 2021. To mitigate biases associated with staggered difference-in-differences (DiD) estimation (Baker et al., 2022), we implement a stacked cohort design following Gormley and Matsa (2011), Cengiz et al. (2019) and Deshpande and Li (2019). For countries adopting in the same year, we construct event-time panels spanning five years before and five years after the policy implementation year. The control group comprises banks headquartered in countries that never adopt mandatory OB regulations by 2024. The resulting baseline panel consists of 42,750 bank-year observations for 1,750 banks across 63 countries over 2013–2023.

M&A transactions are defined as announced deals classified in SDC Platinum as Merger, Acquisition of Assets, or Acquisition of Majority Interest, with announcement dates between 2013 and 2023. The deal value is restricted to no less than \$1 million to eliminate small and economically insignificant deals. Because OB primarily targets retail banking, we further restrict the sample to deals in which the acquirer is a commercial or depository bank (SIC codes 6000, 6019, 6021, 6022, 6029, 6035, 6036). Acquirers are required to be publicly traded so that their accounting and market data are observable in Compustat. These filters yield 979 deals. Table 2 presents the sample distribution of bank M&A activities, detailing the number of deals and their aggregate value in millions of USD. Panel A of Table 2 summarizes

the data by acquirer country or region, revealing significant concentration in the market; for instance, acquirers from the United States account for the vast majority of both deal count (720) and value (\$204,005 million), while other major contributors include Italy, Japan, Spain, and India. Panel B of Table 2 displays the temporal distribution from 2013 to 2023, illustrating notable fluctuations in annual M&A activities, with deal count peaking in the mid-2010s before a sharp decline in 2020, which nonetheless featured a substantial spike in total deal value, suggesting a trend towards larger, albeit fewer, transactions in recent years. The full sample comprises 979 M&A transactions with a combined value of approximately \$338.6 billion, providing a comprehensive overview of the global bank M&A landscape over the decade. ⁴

[Insert Table 2 about here]

3.2.2 Summary Statistics

Panel A of Table 3 reports descriptive statistics for the main variables used in the baseline analysis. On average, banks engage in 0.084 M&A transactions per year, underscoring that acquisitions are infrequent events. The average deal value is \$37.47 million, and the large standard deviation of \$481.28 million highlights substantial cross-sectional dispersion in transaction size. The average bank size, measured as the natural logarithm of market capitalization, is 6.705 with a standard deviation of 2.134, indicating wide heterogeneity in bank scale. The mean leverage ratio is 0.056, while the average return on assets (ROA) is 0.009, suggesting that most sample banks are moderately levered and consistently profitable. The mean market-to-book ratio of 2.053, coupled with a wide interquartile range, points to considerable variation in growth opportunities across banks around the world. At the macro level, countries in the sample exhibit average annual GDP growth of 4.0% and inflation of 3.2%, while the mean private-sector credit-to-GDP ratio is 1.407. Together, these statistics describe a diverse sample covering banks of different sizes, profitability, and macroeconomic

⁴Because the United States and several European countries dominate the sample, robustness tests are conducted by excluding these countries in Table A5.

environments from developed and developing countries.

[Insert Table 3 about here]

Panel B of Table 3 summarizes deal performance variables. Following Li et al. (2018); Levine et al. (2020); Chen et al. (2021), we examine cumulative abnormal returns for the acquirer around acquisition announcements over the five-day window from two days before to two days after the announcement ($CAR(-2,2)$). The average $CAR(-2,2)$ is 0.3%, indicating a modest positive market reaction. The mean one-year and three-year buy-and-hold abnormal returns ($BHAR1$ and $BHAR3$) are -0.7% and -4.7%, respectively, consistent with the well-documented pattern of weak long-run acquirer performance in the M&A literature. Changes in post-deal profitability, measured by $\Delta(ROA)$ over one- and three-year horizons, are close to zero.

Regarding deal characteristics, 36.6% of targets are privately held, 21.1% are subsidiaries, and only 0.8% are technology-focused, implying that few transactions diversify into high-technology sectors. Nearly all deals involve financial institutions (98.5%) and domestic targets (94.4%). Cash-only transactions represent 15.6% of the sample, while all-equity deals account for 24.9%. The average relative size of the target to the acquirer is 0.136, confirming that most acquisitions are small relative to the acquirer’s market value.

4 The Impact of Open Banking on Banks’ M&A Activities

4.1 Stacked-Cohort Difference-in-Differences Regressions

We investigate how open banking adoptions impact banks’ M&A activities. The empirical strategy we employ is similar to the stacked cohort DiD approach for multiple shocks used in Gormley and Matsa (2011). We include five years before and five years after the open banking adoption years to create cohorts for each shock. Control countries in each cohort include

countries that have never mandated an open banking policy and are not included in Table 1. We then stack all cohorts together and employ the DiD regression framework to examine the impact of open banking adoptions on banks' M&A activities. In our setting, it is appropriate to employ the stacked cohort DiD analysis because the shocks were largely exogenous and unexpected to the focal banks. Open banking initiation represents an exogenous shock, as it is a regulatory change imposed externally on the banking sector, typically driven by governmental pressures and international trends, rather than by domestic economic conditions or market forces. These regulatory changes often introduce a rapid change in market dynamics, particularly when enacted within a compressed time frame. This element of unpredictability reinforces the characterization of open banking initiation as an exogenous shock, as both banks and their clients are generally unprepared for such regulatory adjustments. Therefore, open banking offers a unique opportunity to study the effects of mandatory data sharing with external parties on banks' M&A activities within a natural experimental setting. We employ the following ordinary least squares (OLS) stacked cohort DiD regression framework:

$$\begin{aligned} \text{Bank M\&A Activities}_{c,i,t} = & \beta_1 \text{Treat}_{c,k} \times \text{Post}_{c,t} + \text{Firm Controls}_{c,i,t-1} \theta \\ & + \text{Country Controls}_{c,k,t-1} \gamma + \alpha_{c,i} + \lambda_{c,t} + \varepsilon_{c,i,t} \end{aligned} \quad (1)$$

In Equation (1), the dependent variable, $\text{Bank M\&A Activities}_{c,i,t}$, is either the natural logarithm of the total number of M&A deal count announced in year t plus 1 or the natural logarithm of the average M&A deal value announced in year t plus 1. Treat equals 1 if banks' headquarters are located in countries mandating the open banking policy, and it equals 0 otherwise. Post equals 1 if year t is on or after the actual adoption years of the open banking policy, and it equals 0 otherwise. Control variables include bank characteristics such as *Bank Size*, *Leverage*, *Cash*, *Capital*, *ROA*, *Market-to-Book*, *Stock Return*, and country characteristics such as *GDP Growth*, *Private Debt to GDP*, *Inflation*, all of which are lagged one year and are shown to predict M&A activities (Harford, 2005; Ortiz et al., 2023). Cohort-bank fixed effects ($\alpha_{c,i}$) are included to absorb the potential influence of any time-invariant bank

heterogeneity in each country. Cohort-year ($\lambda_{c,t}$) fixed effects are included to absorb the potential influence of any macro trends in M&A activities in each country. Robust standard errors (SE) are clustered at the cohort-country level. The results are reported in Table 4.

[Insert Table 4 about here]

It is clear that open banking adoptions have a significant positive effect on banks' M&A activities, as the regression coefficients of the DiD term, $Treat \times Post$, are positive and statistically significant at the 1% level across all regressions, both with and without control variables. The magnitude of the effect is also economically sizable. In column (2), the coefficient estimate of $Treat \times Post$ is 0.024 (t -stat=3.43) when the dependent variable is $Log(DealCount+1)$. It indicates that deal count on average increases by about 44% for treated banks relative to the respective sample mean after the open banking initiation. Moreover, in column (4) for the dependent variable $Log(DealValue+1)$, the DiD coefficient estimate is 0.131 (t -stat=3.12). Thus, aggregate deal value on average increases by approximately 39% for treated banks relative to the sample mean after the open banking initiation. Overall, the results in Table 4 show that, relative to control banks, treated banks exhibit significant increases in both M&A deal count and deal value after open banking initiation. ⁵

4.2 Dynamic Difference-in-Differences Regressions

To examine whether the documented treatment effect of adopting open banking policy on banks M&A activities is driven by potential nonparallel M&A trends between the treated banks and control banks prior to the mandatory OB adoptions, we include the following dynamic DiD regression framework (Gormley and Matsa, 2011) to identify the exact timing of the treatment effect:

⁵Note that the economic significance of the results is interpreted based on the coefficients from DiD regressions using the logged dependent variables. Results from regressions using the unlogged dependent variables are qualitatively similar. Results are also qualitatively similar when we exclude the exact treatment years observations in the OLS regressions, as shown in Online Appendix Table A2 and A4.

$$\begin{aligned}
Bank\ M\&A\ Activities_{c,i,t} = & \beta_n \sum_{n=-3}^3 (Treat_{c,k} \times Year(\Delta t = n)_{c,t}) + Firm\ Controls_{c,i,t-1} \theta \\
& + Country\ Controls_{c,k,t-1} \gamma + \alpha_{c,i} + \lambda_{c,t} + \varepsilon_{c,i,t}
\end{aligned} \tag{2}$$

Such a dynamic DiD regression model enables us to examine both the existence and timing of the treatment effect. If the increase in banks' M&A activities is indeed caused by adoptions of the open banking policy, then we should expect zero DiD effect between treated banks and control banks prior to the policy adoption—that is, β_{-3} and β_{-2} should be insignificant.⁶ Moreover, we expect the event-year DiD estimate, β_0 , to be either zero or positive and the post-event DiD estimates, β_1 to β_3 , to be positive. The results are reported in Table 5.

[Insert Table 5 about here]

In Table 5, we find no difference between the changes in M&A activities of the treated banks and the changes in M&A activities of the control banks before the adoptions of the open banking policy. The effect of treatment is observed only at and after years of open banking policy adoptions in all specifications. This finding suggests that the treatment effect on banks' M&A activities starts to occur only on the open banking adoption year and persists into future years but does not exist in the years prior to open banking adoptions. The strongest treatment effect is observed two years after the open banking adoptions, as the coefficient β_2 consistently shows the largest magnitude across all dynamic DiD specifications.

[Insert Figure 2 about here]

Figure 2 illustrates coefficient estimates on interaction terms between treatment and time dummies around open banking adoption years. The effect of adopting the open banking policy on banks' M&A deal count is shown in Panel (a), and the effect on M&A deal value is shown in Panel (b). The figure clearly shows that there is no significant difference in M&A

⁶We use $Year(t = -1)$ as the reference year.

deal value and deal count between the control and treatment group before the onset of the treatment. The treated group, compared to the control group, experienced a statistically and economically significant increase in both deal value and deal count only after the open banking adoption years. Thus, the parallel-trends assumption for the efficacy of the DiD approach is satisfied, and the documented effect of open banking adoptions on banks' M&A activities is most likely causal.

4.3 The Heterogeneous Treatment Effects Conditional on Bank and Country Characteristics

We next investigate the heterogeneity of the open banking initiation treatment effects on banks' M&A activities. Equation 3 below elucidates the conditional heterogeneous treatment effects of open banking mandates on banks M&A activities conditional on varied bank- and country-level characteristics.

$$\begin{aligned}
Bank\ M\&A\ Activities_{c,i,t} = & \beta_1 Treat_{c,k} \times Post_{c,t} + \beta_2 Post_{c,t} \times Pre-OB\ Characteristics_i \\
& + \beta_3 Treat_{c,k} \times Post_{c,t} \times Pre-OB\ Characteristics_i \\
& + Firm\ Controls_{c,i,t-1}\theta + Country\ Controls_{c,k,t-1}\gamma + \alpha_{c,i} + \lambda_{c,t} + \varepsilon_{c,i,t}
\end{aligned} \tag{3}$$

As discussed earlier in the hypothesis development (Section 2), we conjecture that the positive treatment effects of open banking initiation on banks M&A activities should be more pronounced for banks with larger size and higher brand value, and countries with pre-existing higher levels of financial inclusion and digital payment adoption. The results in Table 6 provide compelling evidence of heterogeneous treatment effects of open banking mandates on banks M&A activities, contingent on varied bank-specific and country-level characteristics.

[Insert Table 6 about here]

Panel A of Table 6 reveals that the positive effect of open banking adoptions on banks M&A deals is significantly more pronounced for banks with ex-ante competitive advantages. The variables measuring pre-policy bank characteristics are defined as follows. *Pre-OB Brand Value Top 500* is an indicator that equals one for banks listed in the Brand Finance Banking 500 ranking in the year preceding the open banking announcement. *Pre-OB High Market Value* is an indicator variable that identifies banks whose market capitalization, measured in the fiscal year-end prior to the policy announcement, places them in the top tercile relative to all sample banks within their headquarter country. Similarly, *Pre-OB High Total Assets* is an indicator that equals one for banks whose total assets in the year prior to the announcement exceed the top tercile of the asset distribution among sample banks in the same country. The triple interaction coefficients for *Pre-OB High Market Value* and *Pre-OB High Total Assets* are positive and statistically significant at the 1% level for both M&A deal count and deal value. This suggests that larger, more valuable banks responded more aggressively to the new competitive landscape, potentially using M&A as a strategic tool to consolidate market position and acquire innovative capabilities. The positive, though slightly weaker, effect for *Pre-OB Brand Value Top 500* banks indicates that intangible capital also facilitates a strategic response in incentivizing banks consolidation. The small and even negative coefficient on the baseline *Treat × Post* interaction across specifications implies that the average treatment effect is primarily driven by this subset of leading financial institutions, with non-dominant banks exhibiting a muted or negligible response.

Panel B of Table 6 demonstrates that the national financial and technological environment is a critical moderator of the open banking treatment. The variables *Pre-OB High SavedFI*, *Pre-OB High BorrowedFI*, and *Pre-OB High Digital Payment* are indicator variables that capture a country’s pre-existing level of financial development and digital adoption prior to the open banking initiation. Specifically, each variable is set to one if the bank’s headquarter country, based on 2014 World Bank Global Findex database, falls within the

top tercile of the sample countries for the respective metric: the percentage of the population aged 15 and above holding a savings account at a financial institution (*Pre-OB High SavedFI*), the percentage that has borrowed from a financial institution (*Pre-OB High BorrowedFI*), and the percentage that has made or received digital payments (*Pre-OB High Digital Payment*).

The positive and highly significant coefficients on the interactions with *Pre-OB High SavedFI*, *Pre-OB High BorrowedFI*, and *Pre-OB High Digital Payment* indicate that the policy was most effective at stimulating M&A in countries with pre-existing high levels of financial inclusion and digital payment adoption. This is consistent with the view that open banking initiation operates as an accelerant in already fertile ground; a population accustomed to digital finance represents a more competitive market but also a richer ecosystem of potential targets and greater opportunity for synergies after the open banking policy forced banks to share their client information with all their competitors. The consistently insignificant baseline *Treat* $\times$ *Post* term in the deal count regressions further underscores that the policy’s impact is not uniform, but is contingent upon these foundational country characteristics.

In summary, the heterogeneous effects suggest that open banking policies act as a catalyst for industry consolidation, but this effect is strategically led by well-resourced, dominant banks and is economically meaningful primarily in countries where the financial ecosystem is already primed for digital competition after the data sharing.

5 Why Banks Involve in M&A Activities After Open Banking?

The adoption of open banking policies induces strategic M&A in the banking sector as financial institutions seek to optimize profitability in the new competitive landscape. After open banking initiation, banks benefit from conducting M&A by gaining operational

efficiency through the consolidation of fixed compliance costs and technological infrastructure, enhancing revenue generation capabilities through expanded data assets, and increasing market power resulting from reduced competitive pressures. If banks aim to increase M&A activities to create value after the adoption of open banking policies, their profitability should improve subsequently. Thus, we also examine the treatment effect of open banking initiation on banks' performance post M&A deals.

5.1 The Treatment Effects on Post-M&A Market Reactions

The results in Table 7 provide direct evidence on investor perception of M&A deals conducted in the post-open banking environment. Following Li et al. (2018) and Chen et al. (2021), we calculate five-day cumulative abnormal returns (CARs), one- and three-year buy-and-hold abnormal returns (BHARs) to assess market reaction on these open banking driven M&A deals. The positive and statistically significant coefficients on the $Treat \times Post$ interaction across all specifications indicate that the stock market reacts more favorably to M&A announcements by acquirer banks subject to open banking mandates. The short-term market reaction, captured by the five-day cumulative abnormal return ($CAR(-2,2)$), shows a significant increase of approximately 120 to 150 basis points. This immediate positive revaluation suggests that investors perceive these acquisitions as value-enhancing in the new competitive landscape, potentially anticipating strategic benefits such as market consolidation, technology acquisition, or improved scalability that are particularly valuable under open banking initiation.

[Insert Table 7 about here]

Ben-David et al. (2025) documents CAR around acquisition announcement is not a good proxy for expected value creation. Therefore, we also assess the deal performances over longer horizons with one- and three-year buy-and-hold abnormal returns ($BHAR1$ and $BHAR3$). We find that the economic significance of the treatment effect of OB on bank M&A activities becomes even more pronounced over longer horizons. The coefficients for

the one- and three-year BHARs are substantially larger, reaching approximately 11-12% and 45-48%, respectively. The persistence and magnitude of these long-term abnormal returns suggest that the market’s initial optimism is subsequently validated by the acquirer’s post-merger performance. This pattern is consistent with the interpretation that open banking has fundamentally altered the strategic imperative for banks, making M&A a critical tool for adapting to a more open, data-driven financial ecosystem. The deals are not merely viewed as positive short-term signals but are expected to generate sustained competitive advantages. The inclusion of extensive control variables in columns (3), (6), and (9) reinforces the robustness of the core finding. The positive and highly significant $Treat \times Post$ coefficient remains stable after controlling for various bank characteristics, target attributes, and deal financing structures. This stability indicates that the positive market reaction is not driven by observable differences in these deal or acquirer characteristics but is intrinsically linked to the post-open banking regulatory context.

5.2 The Treatment Effects on Bank Long-Term Profitability

Table 8 below presents evidence on the operating performance and strategic outcomes of M&A activities following open banking implementation, providing insight into the channels through which market expectations (documented in Table 7) are realized.

[Insert Table 8 about here]

Panel A of Table 8 examines changes in profitability, measured by banks’ ΔROA in the following three years (Li et al., 2018; Chen et al., 2021). The coefficients for the $Treat \times Post$ interaction on $\Delta ROA1$ and $\Delta ROA3$ are positive and statistically significant once bank- and deal-level characteristics are controlled for in columns (2), (3), (5), and (6). Compared with control banks, treated banks, on average, increase their $\Delta ROA1$ ($\Delta ROA3$) by 0.5-1.2% (0.6-1.4%). This indicates that M&A deals conducted by treated banks in the post-policy period led to a modest but significant improvement in long-term profitability. The economic significance emerges more clearly over the three-year horizon, suggesting that

the integration benefits and revenue synergies from these strategic acquisitions materialize over time rather than immediately. The strongly negative and significant coefficients on the lagged *ROA* control across all specifications confirm the expected mean reversion in profitability, but the positive treatment effect demonstrates that open banking-related deals provide an incremental boost to this dynamic.

Panel B offers a more direct channel for these performance improvements: enhanced total loan growth. The results show that M&A activities post-open banking initiation are associated with a substantial and statistically significant increase in both one-year and three-year gross loan growth (*Gross Loan Growth*). The economic magnitude is particularly striking for the three-year horizon, with treated banks exhibiting gross loan growth approximately 34 to 42% higher than control banks. This suggests that the acquisitions enabled banks to achieve significant scale economies and expand their core lending business more aggressively. The positive and significant coefficient on *Relative Size* further supports the scale hypothesis, indicating that larger deals are associated with greater subsequent loan growth.

Collectively, the findings from both panels suggest that open banking policies shape M&A activities toward more strategically valuable deals that enhance long-term operating performance. The market’s positive reaction, as shown in Table 7, appears to be rationally based on the anticipation of these fundamental improvements. The evidence points to a strategic repositioning where banks use M&A not merely for defensive consolidation but as a proactive tool to achieve the scale and operational efficiency necessary to compete in the new data-driven ecosystem. The stronger effects on loan growth relative to direct profitability measures are consistent with a strategy of prioritizing market share and revenue growth in the transitional period following regulatory change, with profitability improvements following as synergies are realized.

6 Open Banking and Industry Competition

The primary policy objective of OB is to intensify competition in retail banking (CMA, 2016). However, the empirical evidence on its effects at the country level is limited. Thus, we next investigate the impact of adopting open banking policies on the overall banking industry competition. Because most fintechs and private banks are not observable, our sample is limited to publicly listed banks, which predominantly represent incumbents. We use Lerner index as the banking industry competition proxy. Lerner index (*Lerner Index*) is defined as the median gross margin in the bank’s 2-digit SIC industry classifications following Demirguc-Kunt and Martínez Pería (2010) and Aghion et al. (2013). Bank gross margin is calculated as operating revenue minus operating expense scaled by operating revenue in that year. Lower values of *Lerner Index* indicate lower market power and greater industry competition. We measure the banking industry’s competition in the following three years after the implementation of the open banking policy. The results are reported in Panel A of Table 9.

[Insert Table 9 about here]

In Panel A of Table 9, we find that the coefficient estimate on *Treat X Post* is positive and significant at least for the 5% level across all regressions. The results indicate that the banking industry’s *Lerner Index* on average increases by 3.7-6.0% for the treated countries relative to the control countries after open banking adoptions. The findings remain qualitatively unchanged when we exclude (columns (1), (3), (5)) or include (columns (2), (4), (6)) lagged country controls. Overall, we find that treated countries exhibit a significant increase in *Lerner Index* relative to control countries in the following three years after the open banking initiation, which is consistent with our conjecture. This finding is consistent with a market consolidation story, where surviving institutions gain greater pricing power as competition is reconfigured around scale and data-driven services rather than mere presence.

We further examine the treatment effect of open banking initiation on the growth of number of banks ($\Delta Num\ Banks$) in each country-year observations. $\Delta Num\ Banks$ is defined

as the change in the total number of banks in each country-year observation. As shown in Panel B of Table 9, the coefficient estimates on *Treat X Post* are negative and statistically significant across all regression specifications. Thus, the findings suggest that the growth of number of banks is indeed mitigated relative to the control countries after the treatment of open banking initiation. These results indicate that open banking initiation ultimately leads to lower industry competition in the financial sector.

Overall, the findings from both panels indicate that the primary competitive effect of open banking is to spur industry consolidation, thereby increasing the market power of remaining institutions. This suggests that while the policy intends to foster innovation and lower barriers to entry through data sharing, its initial effect is to strengthen the position of incumbent banks that can leverage their scale, brand, and resources to engage in strategic M&A and outcompete smaller rivals. The results imply that the competitive dynamics shift from fragmentation to oligopolistic concentration, at least in the medium term, as the industry adapts to the new technological and regulatory paradigm.

7 Additional Analyses

7.1 Treatment Effect for Banks with M&A History

Table A3 examines whether the effect of open banking is distinct for banks with a history of acquisitions. This test addresses the concern that our baseline results may be driven by banks with no prior M&A experience, for whom a marginal increase in activity may be less economically meaningful. By restricting the sample to experienced acquirers, we test the hypothesis that open banking induces a strategic, consolidation-driven response from players most likely to shape market structure.

To test this explanation, we examine whether our results hold within the subsample of banks with a prior acquisition history. The results, presented in Online Appendix Table A3, are informative. Columns (1) and (2) report estimates for deal count, and columns (3) and

(4) for deal value, both with and without additional lagged controls.

Results indicate that the effect of open banking is substantially stronger for banks with prior M&A experience. The coefficient on our variable of interest, *Treat X Post*, remains positive and statistically significant across all specifications. This finding indicates that the effect of open banking adoption is distinct from—and operates in addition to—the documented persistence of M&A activity. We therefore conclude that our baseline results are unlikely to be driven solely by the self-reinforcing nature of bank acquisition programs.

7.2 Poisson Model and Inverse Hyperbolic Sine Transformation

We conduct additional robustness checks using alternative dependent variables and estimation methods. In columns (1) and (2) in Online Appendix Table A4, we use Poisson regressions instead of ordinary least squares (OLS) regressions for the DID analysis when the dependent variable is M&A deal count. In columns (3) and (4), we use the Inverse Hyperbolic Sine (IHS) transformation of the M&A deal value as the dependent variable (e.g., Bellemare and Wichman, 2020) for the DID analysis. The results show that our baseline findings of the positive treatment effect of adopting the open banking policy on banks’ M&A activities remain robust across these different specifications.

7.3 Excluding Dominant Countries

A potential concern with our baseline analysis is that the results may be unduly influenced by early adopters of open banking reforms or by a single country that contributes a disproportionate share of the sample. For instance, several European jurisdictions implemented open banking between 2016 and 2018 pursuant to the European Union’s Second Payment Services Directive (PSD2). Furthermore, as shown in Online Appendix Table A5, U.S. bank-year observations constitute 6,425 of our total sample (36.819%).

To mitigate these concerns, we conduct a series of robustness tests in which we sequentially exclude these influential subsamples. The Online Appendix A5 presents the results.

Columns (1) and (2) exclude all EU countries, columns (3) and (4) exclude the United States, and columns (5) and (6) exclude both. Across all specifications, the estimated positive effect of open banking adoption on bank M&A activity remains statistically significant and economically meaningful, whether measured by deal count or aggregate value.

This pattern of results indicates that our core findings are not an artifact of early-adopting economies nor driven by the overrepresentation of a single country. Consequently, these checks bolster the external validity of the documented positive relationship between open banking and M&A consolidation in the banking sector.

7.4 Alternative Specifications on Fixed Effects and Standard-Errors Clustering

Our baseline DID specification includes cohort-bank and cohort-year fixed effects to account for time-invariant bank-level heterogeneity and common macroeconomic shocks, respectively. Heteroskedasticity-robust standard errors are clustered at the cohort-country level.

To ensure our findings are not sensitive to the choice of fixed effects or standard error clustering structure, we conduct a series of robustness tests incorporating more granular controls for unobserved heterogeneity arising from industry, country, year, and their interactions. The results are presented in Online Appendix Table [A6](#).

To evaluate the robustness of our empirical specification, we implement a series of tests with progressively more demanding fixed effects and alternative error structures. The specification in columns (1) and (6) of Appendix Table [A6](#) is augmented with cohort-industry fixed effects. Columns (2) and (7) introduce a more stringent set of cohort-industry by year fixed effects, which absorb all time-varying, industry-specific unobservables. We further assess the sensitivity of our inference to different correlation structures in the error term. Standard errors are clustered at the country level in columns (3) and (8), and two-way clustered at the country and year levels in columns (4) and (9). Finally, columns (5) and (10) report standard errors clustered by country and industry.

The estimated coefficient on the variable of interest remains positive and statistically significant at conventional levels across all alternative specifications, irrespective of whether the dependent variable is measured as deal count or deal value. The stability of the economic and statistical significance in these more demanding specifications reinforces the robustness of our central finding—the adoptions of open banking policy incentivize more valuable banks M&A activities, indicating that it is not an artifact of unobserved heterogeneity, specific clustering assumptions, or omitted time-varying shocks.

7.5 Different Types of Banks’ M&A

We separately examine the impact of adopting open banking policy on banks’ different types of M&A activities: 1). Financial industry M&A; 2). Non-financial industry M&A 3). Domestic M&A; 4). Cross-border M&A using the same stacked-cohort DID regressions framework. The results are reported in the Online Appendix Table [A7](#).

Panel A of Table [A7](#) reports the treatment effects of adopting open banking on financial industry and non-financial industry M&A activities, respectively. Open banking intensifies intra-industry competition and makes scale, efficiency, and data access critical. As a result, banks are more likely to pursue M&A within the financial sector to consolidate power, share costs, and remain competitive—rather than branching out into unfamiliar industries with higher integration risks. Financial industry M&A are defined as mergers and acquisitions where both the acquirer and the target firms share the same first-digit SIC code of 6, indicating classification within the financial sector. As expected, we find that the increase in treated banks’ M&A activities mainly concentrates on financial industry M&A deals but not in deals involving different industry acquirers and targets.

In addition, the adoption of open banking policies is likely to promote same-country M&A activities among banks rather than cross-border M&A. By facilitating data sharing and intensifying competition, open banking incentivizes domestic banks to consolidate, achieving greater scale and operational efficiency. Same-country mergers benefit from stream-

lined regulatory compliance, fewer data privacy hurdles, and simpler operational integration. In contrast, cross-border M&A face complexities arising from divergent regulatory regimes, data localization requirements, and currency risks, rendering domestic mergers a more viable strategy for banks adapting to open banking. Panel B of Table A7 reports the treatment effects of open banking adoption on same-country and cross-border M&A. Consistent with our hypothesis, we find that open banking policies significantly increase same-country M&A activities but have no discernible effect on cross-border deals. Moreover, we detect no evidence of risk spillovers between acquirers and targets across different countries.

8 Conclusion

Open banking reallocates control over transaction data to consumers and standardizes access through APIs. This reform reshapes the production of information in banking and alters how incumbents defend and rebuild their advantage. Using the global staggered rollout of open banking and a stacked-cohort difference-in-differences research design, we show that banks exposed to open banking reorganize along the market for corporate control. The composition tilts toward domestic and within-finance transactions, and the pattern is strongest where incumbent bank acquirers have greater scale and brand capital and where digital payments and financial inclusion are already high. These features are consistent with a capability-scaling and data-stewardship rationale in which standardized access raises the returns to integrating data assets, engineering capacity, and distribution inside the firm and leads to an expansion of the firm boundary.

We further find that open banking era deals undertaken by exposed acquirers create value and are followed by improvements in operating performance, which suggests that data interoperability lowers integration frictions and enables more granular screening, monitoring, and cross-selling. At the same time, market indicators point to a more concentrated market structure and greater pricing power. The evidence therefore highlights a potential policy

trade-off: OB invites entry and innovation, yet it also encourages well-positioned incumbents to internalize complementarities through M&A, which can temper gains from heightened contestability.

These results contribute to the literature on open banking by documenting an incumbent reorganization margin that complements evidence on entry, switching, and API adoption. They also contribute to research on bank mergers by identifying a regulatory shock that shifts both the quantity and quality of bank M&A transactions and by linking data interoperability to post-deal value and performance. For policy implications, the findings imply that data-rights regimes and merger review should be considered jointly. Interoperability and non-discrimination standards that level capabilities across providers can preserve contestability, while merger assessment that accounts for data complementarities can safeguard consumer welfare without suppressing dynamic operating efficiency.

Figure 1: Announcement Years of Open Banking

This figure displays the announcement years of mandatory Open Banking policies from 2016 to 2021 around the world. Data on the open banking policies are current as of December 2024.

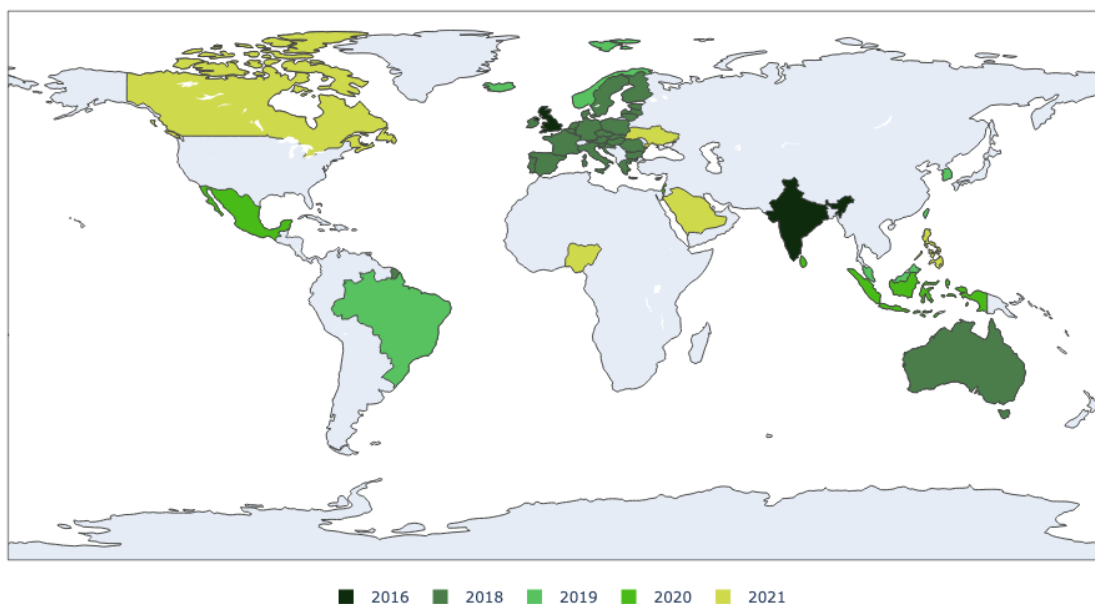
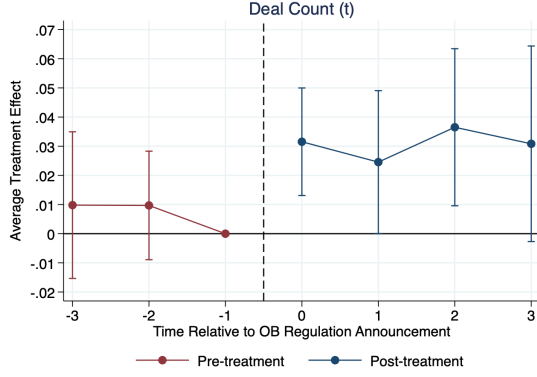
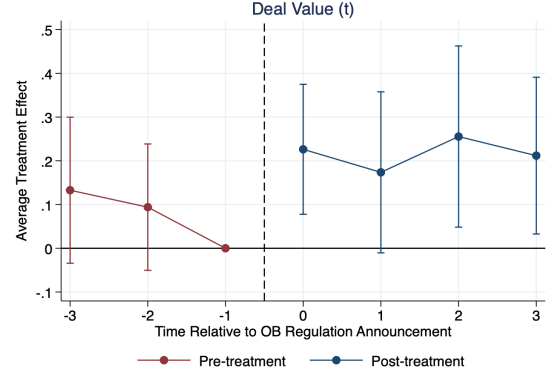


Figure 2: Dynamic Effects of OB on Bank M&A Activities

This figure shows the dynamic effects of the mandatory Open Banking policy announcement on bank M&A activities. Coefficients are estimated using the dynamic difference-in-differences regression with Equation 2. Panel (a) presents the dynamic treatment effect on the log of deal count plus one, and Panel (b) presents the effect on the log of deal value plus one. The x-axis represents the year indicator for the n th year relative to the Open Banking announcement year and equals one if $\Delta t = n$ (where $n = -3, -2, 0, 1, 2, 3$) and equals zero otherwise. We use $Year(\Delta t = -1)$ as the reference year.



(a) Bank M&A Log(Deal Count+1)



(b) Bank M&A Log(Deal Value+1)

Table 1: Open Banking Regulations by Country/Region

This table provides a comprehensive overview of the introduction of mandatory Open Banking policies around the world. For each country or region, we report the year in which open banking is formally announced, the year in which the regulation is effective, the primary regulatory instrument or national law underpinning its implementation, and the issuing institution. For European Union and European Economic Area (EU/EEA) member states, the table reflects the transposition of the European Union’s Second Payment Services Directive (PSD2), alongside the specific national legislative act or amendment that incorporated PSD2 into domestic law. For non-EU jurisdictions, the table identifies the country-specific regulatory approach, which ranges from statutory enactments to central bank circulars and policy frameworks.

Country/ Region	OB announcement year	Data sharing year	Regulation	Issuing institution
Australia	2018	2020	Consumer Data Right	Australian Government (Treasury) and Australian Competition and Consumer Commission
Austria	2018	2019	Transposition of PSD2: Austrian Payment Services Act	Bank Austria
Bahrain	2018	2020	Bahrain Open Banking Framework	Central Bank of Bahrain
Belgium	2018	2019	Transposition of PSD2: Act of 11 March 2018	National Bank of Belgium
Brazil	2019	2021	Banco Central do Brasil Joint Resolution No. 1 (announced through BCB Public Consultation No. 73/2019)	Banco Central do Brasil
Bulgaria	2018	2019	Transposition of PSD2: Law on Payment Services and Payment Systems	Bulgarian National Bank
Canada	2021	2026	Advisory Committee Final Report on Open Banking	Department of Finance Canada
Croatia	2018	2019	Transposition of PSD2: Payment System Act (OG 66/2018)	Croatian National Bank
Cyprus	2018	2019	Transposition of PSD2: Provision and Use of Payment Services and Access to Payment Systems Laws of 2018 to 2022	Central Bank of Cyprus
Czechia	2018	2019	Transposition of PSD2: Act No. 370/2017 Coll. on Payment System	The Parliament of the Czech Republic
Denmark	2018	2019	Transposition of PSD2: Danish Payments Act	Danish Financial Supervisory Authority
Estonia	2018	2019	Transposition of PSD2: Payment Institutions and E-money Institutions Act	Riigikogu (the unicameral parliament of Estonia)
Finland	2018	2019	Transposition of PSD2: Finnish Payment Services Act	The Financial Supervisory Authority
France	2018	2019	Transposition of PSD2: Ordinance No. 2017-1252 and Decree No. 2017-1313	The Minister of the Economy and Finance
Germany	2018	2019	Transposition of PSD2: Payment Services Supervision Act	Federal Financial Supervisory Authority (BaFin)
Greece	2018	2019	Transposition of PSD2: Law 4537/2018	Bank of Greece
Hungary	2018	2019	Transposition of PSD2: Amendments to Act LXXXV of 2009 on the Pursuit of the Business of Payment Services	Hungarian National Bank
Iceland	2019	2019	Transposition of PSD2: Amendments to Act on Payment Services No. 120/2011	Central Bank of Iceland
India	2016	2021	RBI Master Directions on Account Aggregator under the Non-Banking Financial Company Master Directions	Reserve Bank of India
Indonesia	2020	2021	National Standard for Open API for Payments	Bank Indonesia
Ireland	2018	2019	Transposition of PSD2: S.I. No. 6/2018	Central Bank of Ireland
Israel	2020	2020	Proper Conduct of Banking Business Directive 368	Bank of Israel
Italy	2018	2019	Transposition of PSD2: Legislative Decree No. 218/2017	Bank of Italy
Latvia	2018	2019	Transposition of PSD2: Amendments to Payment Services and Electronic Money Law	Financial and Capital Market Commission and Bank of Latvia
Liechtenstein	2019	2019	Transposition of PSD2: Payment Services Act (Zahlungsdienstegesetz, ZDG)	Liechtenstein Financial Market Authority
Lithuania	2018	2019	Transposition of PSD2: Amendments to Law on Payments	Bank of Lithuania
Luxembourg	2018	2019	Transposition of PSD2: Law of 20 July 2018	Commission de Surveillance du Secteur Financier
Malaysia	2019	2019	Policy Document on Publishing Open Data using Open API	Bank Negara Malaysia
Malta	2018	2019	Transposition of PSD2: Amendments to Financial Institutions Act	Malta Financial Services Authority
Mexico	2020	2020	Article 76 of the Fintech Law	Congress of Mexico, The National Banking and Securities Commission and Banco de México
Netherlands	2018	2019	Transposition of PSD2: Wet implementatie PSD2	De Nederlandsche Bank
Nigeria	2021	2025	CBN Regulatory Framework for Open Banking	Central Bank of Nigeria
Norway	2019	2019	Transposition of PSD2: Amendments to the Financial Contracts Act in 2019	Ministry of Finance and Finanstilsynet
Philippines	2021	2023	BSP Circular No. 1122 – Open Finance Framework	Bangko Sentral ng Pilipinas
Poland	2018	2019	Transposition of PSD2: Act of 10 May 2018 on Payment Services	Komisja Nadzoru Finansowego (Polish Financial Supervision Authority)
Portugal	2018	2019	Transposition of PSD2: Decree-Law No. 91/2018	Banco de Portugal
Romania	2018	2019	Transposition of PSD2: Law No. 209/2019	National Bank of Romania
Saudi Arabia	2021	2022	SAMA Open Banking Policy	Saudi Central Bank
Slovakia	2018	2019	Transposition of PSD2: Amendments to Act No. 492/2009 Coll. on Payment Services	National Bank of Slovakia
Slovenia	2018	2019	Transposition of PSD2: Payment Services, Electronic Money Issuance Services and Payment Systems Act	Banka Slovenije
South Korea	2019	2019	Electronic Financial Transactions Act (EFTA)	Financial Services Commission
Spain	2018	2019	Transposition of PSD2: Royal Decree-Law 19/2018	Banco de España
Sweden	2018	2019	Transposition of PSD2: Amendments to Swedish Payment Services Act	Swedish Financial Supervisory Authority
Taiwan	2019	2019	Open Banking Guidelines	Financial Supervisory Commission
Turkey	2019	2020	Amendments to Law No. 6493	Central Bank of the Republic of Turkey
Ukraine	2021	2025	Law on Payment Services	National Bank of Ukraine
United Kingdom	2016	2018	Final Report on Retail Banking Market Investigation	Competition and Markets Authority

Table 2: Sample Distribution

This table summarizes the number of M&A deals and their value in millions of USD in raw numbers. Panel A displays the data by acquirer country or region, and Panel B shows the breakdown by year from 2013 to 2023.

Panel A: Bank M&A Deals by Acquirer Country/Region						Panel B: Bank M&A Deals by Year		
Acquirer Country/Region	Deal Count	Deal Value	Acquirer Country/Region	Deal Count	Deal Value	Year	Deal Count	Deal Value
Argentina	3	64.418	Morocco	3	526.381	2013	107	19384.780
Australia	9	3038.683	Netherlands	3	232.971	2014	131	27623.290
Austria	4	382.159	Nigeria	2	120.017	2015	138	34279.608
Brazil	9	6948.275	Norway	6	163.129	2016	115	34972.634
Canada	14	26245.183	Pakistan	2	159.552	2017	122	37081.372
Chile	5	1389.400	Peru	4	501.371	2018	122	38391.631
China	2	3138.648	Philippines	5	2182.461	2019	95	26314.426
Colombia	2	2102.714	Poland	11	3812.968	2020	55	59116.055
Croatia	2	47.571	Saudi Arabia	4	19775.529	2021	93	54582.655
Denmark	11	2688.141	South Africa	1	29.744	2022	53	23473.919
Finland	2	150.976	South Korea	16	6274.704	2023	34	20759.986
France	5	2521.425	Spain	30	20634.617	Total	979	338,628.651
Germany	11	2094.192	Sri Lanka	2	11.754			
Greece	4	1709.397	Sweden	2	939.649			
Hong Kong	1	66.159	Switzerland	9	5171.213			
India	20	13917.934	Taiwan	2	1007.294			
Indonesia	4	848.577	Thailand	6	4155.968			
Israel	1	411.532	Turkey	10	264.920			
Italy	51	13485.892	United Kingdom	11	10821.031			
Japan	40	11252.442	United States	720	204005.136			
Malaysia	2	53.357	Vietnam	3	568.089			
Mexico	8	1955.969	Total	979	338,628.651			

Table 3: Summary Statistics

This table presents the summary statistics of all variables used in our main difference-in-differences regression sample and the deal-level analysis. The summary statistics include mean, median, standard deviation, p25, p75 and the number of observations for each variable. The sample period covers 2013-2023. Table A1 in the Appendix provides detailed variable definitions. Bank-level, country-level and deal-level variables are winsorized at the 1st and 99th percentile.

Panel A: Bank characteristics						
Variable	Mean	Median	Std. Dev.	P25	P75	N
Deal Count	0.084	0.000	0.334	0.000	0.000	42,750
Log(DealCount+1)	0.054	0.000	0.201	0.000	0.000	42,750
Deal Value	37.473	0.000	481.281	0.000	0.000	42,750
Log(DealValue+1)	0.337	0.000	1.299	0.000	0.000	42,750
Bank Size	6.705	6.457	2.134	5.160	8.089	42,750
Leverage	0.056	0.032	0.065	0.014	0.075	42,750
Cash	0.054	0.025	0.065	0.012	0.077	42,750
Capital	0.101	0.096	0.046	0.075	0.119	42,750
ROA	0.009	0.009	0.008	0.005	0.012	42,750
Market-to-Book	2.053	1.414	3.004	0.864	2.442	42,750
Stock Return	0.098	0.064	0.282	-0.077	0.234	42,750
GDP Growth	0.040	0.043	0.072	0.016	0.066	42,750
Private Debt to GDP	1.407	1.534	0.531	1.501	1.605	42,750
Inflation	0.032	0.021	0.064	0.012	0.041	42,750
Panel B: Deal characteristics						
Variable	Mean	Median	Std. Dev.	P25	P75	N
CAR(-2,2)	0.003	0.001	0.045	-0.022	0.028	979
BHAR1	-0.007	-0.015	0.243	-0.147	0.129	977
BHAR3	-0.047	-0.084	0.426	-0.341	0.216	977
Δ ROA1	0.000	0.001	0.011	-0.002	0.003	857
Δ ROA3	0.000	0.001	0.011	-0.002	0.003	857
Bank Size	7.556	7.364	2.002	6.105	8.651	979
Leverage	0.114	0.087	0.098	0.048	0.147	979
ROA	0.010	0.009	0.008	0.006	0.012	979
Market-to-Book	2.355	1.916	1.584	1.241	3.048	979
Stock Return	0.174	0.125	0.320	-0.017	0.316	979
Private Target	0.366	0.000	0.482	0.000	1.000	979
Subsidiary Target	0.211	0.000	0.409	0.000	0.000	979
Technology Target	0.008	0.000	0.090	0.000	0.000	979
Financial	0.985	1.000	0.123	1.000	1.000	979
Domestic	0.944	1.000	0.230	1.000	1.000	979
All Cash	0.156	0.000	0.363	0.000	0.000	979
All Equity	0.249	0.000	0.433	0.000	0.000	979
Relative Size	0.136	0.065	0.202	0.019	0.165	979

Table 4: The Impact of Open Banking on Banks' M&A Activities

This table reports the treatment effects of Open Banking on bank M&A activities for the period between 2013 and 2023, which is estimated using the stacked cohort difference-in-differences regression with Equation 1. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . Treat is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. Post is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	$\text{Log}(\text{DealCount} + 1)_t$		$\text{Log}(\text{DealValue} + 1)_t$	
	(1)	(2)	(3)	(4)
Treat $\times$ Post	0.026*** (0.006)	0.024*** (0.007)	0.140*** (0.041)	0.131*** (0.042)
Bank Size $_{t-1}$		-0.014*** (0.005)		-0.088*** (0.026)
Leverage $_{t-1}$		-0.111*** (0.034)		-0.686*** (0.216)
Cash $_{t-1}$		-0.010 (0.025)		0.047 (0.180)
Capital $_{t-1}$		-0.066 (0.074)		-0.457 (0.490)
ROA $_{t-1}$		0.134 (0.112)		1.314** (0.590)
Market-to-Book $_{t-1}$		0.003*** (0.001)		0.014*** (0.005)
Stock Return $_{t-1}$		0.018*** (0.004)		0.124*** (0.029)
GDP Growth $_{t-1}$		-0.013 (0.015)		-0.062 (0.098)
Private Debt to GDP $_{t-1}$		-0.003 (0.011)		0.039 (0.088)
Inflation $_{t-1}$		-0.034* (0.018)		-0.166 (0.116)
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	42,750	42,750	42,750	42,750
Adjusted R^2	0.196	0.198	0.173	0.175

Table 5: Dynamic Effects of Open Banking on Banks' M&A Activities

This table reports the dynamic effects of Open Banking on bank M&A activities for the period between 2013 and 2023, which is estimated using the dynamic difference-in-differences regression with Equation 2. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . Treat is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. $\text{Year}(\Delta t = n)_{c,t}$ represents the year indicator for the n th year relative to the Open Banking announcement year in cohort c and equals one if $\Delta t = n$ (where $n=-3, -2, 0, 1, 2, 3$) and equals zero otherwise. We use $\text{Year}(\Delta t = -1)$ as the reference year. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	$\text{Log}(\text{DealCount} + 1)_t$		$\text{Log}(\text{DealValue} + 1)_t$	
	(1)	(2)	(3)	(4)
$\text{Treat} \times \text{Year}(\Delta t = -3)$	0.010 (0.013)	0.010 (0.014)	0.130 (0.086)	0.133 (0.090)
$\text{Treat} \times \text{Year}(\Delta t = -2)$	0.009 (0.010)	0.010 (0.010)	0.088 (0.077)	0.094 (0.078)
$\text{Treat} \times \text{Year}(\Delta t = 0)$	0.032*** (0.010)	0.032*** (0.010)	0.225*** (0.079)	0.226*** (0.079)
$\text{Treat} \times \text{Year}(\Delta t = 1)$	0.026** (0.013)	0.025* (0.013)	0.182* (0.097)	0.174* (0.098)
$\text{Treat} \times \text{Year}(\Delta t = 2)$	0.039*** (0.015)	0.037** (0.014)	0.272** (0.115)	0.255** (0.111)
$\text{Treat} \times \text{Year}(\Delta t = 3)$	0.032** (0.014)	0.031** (0.015)	0.217*** (0.082)	0.212** (0.083)
Controls	No	Yes	No	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	42,750	42,750	42,750	42,750
Adjusted R^2	0.196	0.198	0.173	0.175

Table 6: Heterogeneous Effects Conditional on Bank and Country Characteristics

This table reports the treatment effects of Open Banking on bank M&A activities conditional on bank characteristics and bank headquarter country characteristics, which are estimated using the stacked cohort difference-in-differences regression with interaction terms. Panel A reports heterogeneity based on bank characteristics and Panel B reports the results for bank headquarter country characteristics. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . *Treat* is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. *Post* is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. *Pre-OB Brand Value Top 500* is an indicator variable that equals one if the bank is included in the top 500 Banking Brands from Brand Finance prior to the Open Banking announcement. *Pre-OB High Market Value* is an indicator variable that equals one if the bank's market capitalization in the year prior to the Open Banking policy announcement exceeds the tercile market capitalization of all banks in the same country during that year and equals zero otherwise. *Pre-OB High Total Assets* is an indicator variable that equals one if the bank's Total Assets in the year prior to the Open Banking policy announcement is higher than the tercile total assets of all banks in the same country during that year and equals zero otherwise. *Pre-OB High SavedFI* is an indicator variable that equals one if the percentage of the population aged 15 and above with savings accounts at a financial institution in the bank's headquarter country exceeds the top tercile across all countries in 2014, and zero otherwise. *Pre-OB High BorrowedFI* is an indicator variable that equals one if the percentage of the population aged 15 and above who borrowed a financial institution in the bank's headquarter country exceeds the top tercile across all countries in 2014, and zero otherwise. *Pre-OB High Digital Payment* is an indicator variable that equals one if the percentage of the population aged 15 and above who made or received digital payments in the bank's headquarter country exceeds the top tercile across all countries in 2014, and zero otherwise. All specifications include lagged firm and country characteristics, cohort-bank fixed effects and cohort-year fixed effects. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Bank Characteristics						
Dependent Variable	$Log(DealCount + 1)_t$			$Log(DealValue + 1)_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
Treat $\times$ Post $\times$ Pre-OB Brand Value Top 500	0.026*			0.240**		
	(0.014)			(0.098)		
Treat $\times$ Post $\times$ Pre-OB High Market Value		0.057***			0.392***	
		(0.016)			(0.111)	
Treat $\times$ Post $\times$ Pre-OB High Total Assets			0.075***			0.484***
			(0.016)			(0.103)
Treat $\times$ Post	0.018**	0.003	-0.005	0.070	-0.013	-0.054
	(0.008)	(0.007)	(0.006)	(0.043)	(0.043)	(0.039)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	42,750	42,405	42,405	42,750	42,405	42,405
Adjusted R^2	0.198	0.200	0.201	0.175	0.177	0.178

Panel B: Bank Headquarter Country Characteristics						
Dependent Variable	$Log(DealCount + 1)_t$			$Log(DealValue + 1)_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
Treat $\times$ Post $\times$ Pre-OB High SavedFI	0.048***			0.222***		
	(0.011)			(0.078)		
Treat $\times$ Post $\times$ Pre-OB High High BorrowedFI		0.047***			0.212***	
		(0.011)			(0.078)	
Treat $\times$ Post $\times$ Pre-OB High Digital Payment			0.048***			0.225***
			(0.011)			(0.079)
Treat $\times$ Post	-0.001	-0.001	-0.001	0.041	0.045	0.041
	(0.006)	(0.006)	(0.006)	(0.042)	(0.042)	(0.042)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	42,567	42,567	42,567	42,567	42,567	42,567
Adjusted R^2	0.196	0.196	0.196	0.174	0.174	0.174

Table 7: Why Do Open Banking Affect Banks' M&A Activities? Market Reaction

This table reports the relation between the Open Banking policy for acquirers and their stock market reaction to deal announcements. The sample consists of 979 completed bank M&A deals between 2013 and 2023 from the LSEG SDC database. The dependent variables $CAR(-2, 2)$ is cumulative abnormal returns from 2 trading days before to 2 trading days after the announcement; $BHAR1(3)$ is the one-year (three-year) buy-and-hold abnormal stock return of the acquirer starting from the month after deal completion with market indices as the benchmark. $Treat$ is an indicator that equals one if the acquirer bank is headquartered in a country that has mandated the Open Banking policy and zero otherwise. $Post$ equals one if deal announcement year is in the post-event period and zero in the pre-event period. All specifications include country, 2-digit Standard Industrial Classification (SIC) industry, and year fixed effects. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	CAR(-2,2)			BHAR1			BHAR3		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treat $\times$ Post	0.015*** (0.005)	0.012* (0.006)	0.013** (0.006)	0.117** (0.051)	0.120** (0.051)	0.114** (0.054)	0.481*** (0.096)	0.455*** (0.101)	0.455*** (0.101)
Bank Size		-0.003*** (0.001)	-0.001* (0.001)		-0.010 (0.007)	-0.014** (0.007)		-0.018* (0.009)	-0.028*** (0.009)
Leverage		-0.001 (0.024)	-0.004 (0.021)		0.107 (0.074)	0.114 (0.097)		-0.056 (0.131)	0.019 (0.149)
ROA		-0.097 (0.200)	-0.097 (0.184)		0.972 (1.116)	0.743 (1.447)		1.047 (1.478)	1.760 (1.451)
Market-to-Book		-0.001 (0.001)	-0.001 (0.001)		0.002 (0.009)	-0.000 (0.009)		-0.018 (0.016)	-0.022 (0.017)
Stock Return			-0.005 (0.007)			0.010 (0.058)			-0.129*** (0.046)
Private Target			0.020*** (0.003)			-0.015* (0.007)			-0.002 (0.014)
Subsidiary Target			0.019*** (0.004)			0.017 (0.022)			-0.026 (0.036)
Technology Target			-0.070*** (0.010)			-0.107* (0.059)			-0.102 (0.143)
Financial			-0.008 (0.010)			-0.034 (0.070)			-0.084 (0.053)
Domestic			0.012* (0.007)			0.048 (0.034)			0.118* (0.065)
All Cash			0.003 (0.003)			0.016 (0.011)			0.040** (0.019)
All Equity			-0.005** (0.002)			0.007 (0.014)			0.029** (0.012)
Relative Size			0.007 (0.010)			-0.119** (0.045)			-0.263*** (0.058)
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	979	979	979	977	977	977	977	977	977
Adjusted R^2	0.025	0.032	0.089	0.288	0.289	0.294	0.412	0.423	0.440

Panel B: Loan Growth Post M&A Deals						
Dependent Variable	Gross Loan Growth _{t+1}			Gross Loan Growth _{t+3}		
	(1)	(2)	(3)	(4)	(5)	(6)
Treat × Post	0.078*** (0.026)	0.064** (0.024)	0.064** (0.028)	0.418*** (0.120)	0.349*** (0.113)	0.341** (0.131)
Bank Size		-0.018*** (0.002)	-0.002 (0.003)		-0.091*** (0.008)	-0.059*** (0.013)
Leverage		-0.019 (0.064)	-0.043 (0.053)		-0.334 (0.594)	-0.409 (0.545)
ROA		-2.108*** (0.621)	-2.625*** (0.631)		-16.608** (6.070)	-18.421** (7.561)
Market-to-Book		0.003* (0.002)	0.004 (0.003)		0.021*** (0.004)	0.023*** (0.005)
Stock Return			0.114*** (0.012)			0.373*** (0.068)
Private Target			-0.009 (0.007)			-0.048*** (0.012)
Subsidiary Target			-0.016 (0.010)			-0.023 (0.026)
Technology Target			-0.174** (0.068)			-0.162 (0.152)
Financial			-0.183* (0.091)			-0.176 (0.177)
Domestic			0.005 (0.018)			-0.136 (0.085)
All Cash			-0.016** (0.006)			-0.041** (0.019)
All Equity			0.006 (0.006)			0.055*** (0.019)
Relative Size			0.345*** (0.045)			0.766*** (0.141)
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	796	796	796	733	733	733
Adjusted R^2	0.076	0.092	0.208	0.165	0.218	0.282

Table 8: Why Do Open Banking Affect Banks' M&A Activities? Bank Long-term Profitability

This table reports the relation between the Open Banking policy for acquirers and long-term deal performance. The dependent variable $\Delta ROA1$ is the change in acquirer return on assets from the year before deal announcement to the year after deal completion. $\Delta ROA3$ is the average ROA of the acquirer in the 3-year period after deal completion minus ROA of the acquirer in the year prior to deal announcement. Gross Loan Growth $_{t+1}$ (Consumer Loan Growth $_{t+1}$) is the gross (consumer) loan growth for the acquirer one year after the deal announcement. *Treat* is an indicator that equals one if the acquirer bank is headquartered in a country that has mandated the Open Banking policy and zero otherwise. *Post* equals one if deal announcement year is in the post-event period and zero in the pre-event period. All specifications include country, 2-digit SIC industry, and year fixed effects. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: ΔROA Post M&A Deals						
Dependent Variable		$\Delta ROA1$			$\Delta ROA3$	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat $\times$ Post	0.012 (0.008)	0.005** (0.002)	0.005** (0.002)	0.014* (0.008)	0.006*** (0.002)	0.006*** (0.002)
Bank Size		-0.001 (0.001)	-0.000 (0.001)		-0.000 (0.001)	-0.000 (0.001)
Leverage		0.003 (0.006)	0.002 (0.005)		-0.000 (0.005)	-0.001 (0.004)
ROA		-1.087*** (0.129)	-1.110*** (0.130)		-1.097*** (0.145)	-1.121*** (0.144)
Market-to-Book		0.001 (0.001)	0.001 (0.001)		0.001 (0.001)	0.001 (0.001)
Stock Return			0.003 (0.002)			0.004 (0.002)
Private Target			0.000 (0.000)			0.000 (0.000)
Subsidiary Target			-0.000 (0.001)			-0.000 (0.001)
Technology Target			-0.007*** (0.002)			-0.005*** (0.002)
Financial			-0.004 (0.003)			-0.003 (0.003)
Domestic			0.000 (0.001)			0.001 (0.001)
All Cash			-0.001* (0.001)			-0.001 (0.001)
All Equity			-0.001*** (0.000)			-0.001** (0.000)
Relative Size			-0.001 (0.001)			-0.002 (0.001)
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	855	855	855	855	855	855
Adjusted R^2	0.113	0.562	0.568	0.126	0.574	0.579

Table 9: The Impact of Adopting Open Banking on Country-level Banking Competition

This table reports the impact of adopting the open banking policy on country-level banking competition measures. Panel A (B) presents the results from stacked cohort difference-in-differences regressions examining the impact of adopting open banking on the Lerner Index (the change in the number of banks) from t to $t+2$. The Lerner Index is the median gross margin in the bank's two-digit SIC industry. Δ Num Banks is the change in the number of banks in a country. *Treat* is an indicator variable that equals one if the country has mandated the Open Banking policy and equals zero otherwise. *Post* is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. Panel A includes country, 2-digit Standard Industrial Classification (SIC) industry, and year fixed effects. Panel B includes country and year fixed effects. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Lerner Index						
Dependent Variable	Lerner Index _{t}		Lerner Index _{$t+1$}		Lerner Index _{$t+2$}	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat $\times$ Post	0.060*** (0.017)	0.057*** (0.017)	0.051*** (0.018)	0.051*** (0.018)	0.037** (0.018)	0.037** (0.019)
Controls	No	Yes	No	Yes	No	Yes
Cohort-Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,812	1,715	1,643	1,556	1,442	1,367
Adjusted R^2	0.576	0.607	0.582	0.611	0.585	0.598

Panel B: Growth of Number of Banks						
Dependent Variable	Δ Num Banks _{t}		Δ Num Banks _{$t+1$}		Δ Num Banks _{$t+2$}	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat $\times$ Post	-0.875** (0.437)	-0.968** (0.467)	-1.565* (0.844)	-1.765* (0.948)	-1.678* (0.926)	-1.818* (1.028)
Controls	No	Yes	No	Yes	No	Yes
Cohort-Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,751	1,636	1,599	1,502	1,447	1,360
Adjusted R^2	0.135	0.133	0.140	0.138	0.101	0.103

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Appendix Table A1: Variable Definitions

Variable	Definition	Source
Deal Count	The number of M&A deals announced in a given bank-year.	LSEG SDC Platinum
Log(Deal Count+1)	The natural logarithm of one plus the number of M&A deals.	LSEG SDC Platinum
Deal Value	The total value of M&A deals (in millions of USD) for a given bank-year.	LSEG SDC Platinum
Log(Deal Value+1)	The natural logarithm of one plus the total deal value.	LSEG SDC Platinum
Bank Size	The natural logarithm of market capitalization (in millions of USD).	Compustat North America & Global
Leverage	The ratio of total liabilities to total assets.	Compustat North America & Global
Cash	The ratio of cash and short-term investments to total assets.	Compustat North America & Global
Capital	The ratio of equity capital to total assets.	Compustat North America & Global
ROA	Return on assets, measured as net income before extraordinary items divided by total assets.	Compustat North America & Global
Market-to-Book	The ratio of market value of equity to book value of equity.	Compustat North America & Global
Stock Return	The annual stock return of the bank.	Compustat North America & Global
GDP Growth	Annual nominal GDP growth rate of the country.	World Bank
Private Debt to GDP	The ratio of private sector debt to GDP.	IMF

Variable	Definition	Source
Inflation	The annual change in the consumer price index (CPI).	World Bank
CAR(-2,2)	Cumulative abnormal return around the M&A announcement, computed over the five-day event window from two days before to two days after the M&A announcement using the market model. Daily abnormal returns are the residuals from a regression of the acquirer's stock returns on the corresponding country's value-weighted market index over the estimation window $(-200, -60)$ relative to the announcement date.	Compustat North America & Compustat Global
BHAR1	One-year buy-and-hold abnormal return (BHAR), defined as the difference between the acquirer's buy-and-hold return and that of the corresponding market index over one year, starting one month after the deal announcement.	Compustat North America & Compustat Global
BHAR3	Three-year buy-and-hold abnormal return (BHAR), defined analogously to BHAR1 but measured over the three years following the deal announcement.	Compustat North America & Compustat Global
$\Delta ROA1$	Change in the acquirer's return on assets (ROA) from the year prior to the deal announcement to the year following deal completion.	Compustat North America & Compustat Global
$\Delta ROA3$	Change in the acquirer's average ROA, defined as the difference between the mean ROA over the three years following deal completion and the ROA in the year prior to the announcement.	Compustat North America & Compustat Global
Gross Loan Growth $_{t+1}$	Growth rate of the acquirer's total gross loans from the year before the deal announcement to the year after deal completion.	LSEG Datastream

Variable	Definition	Source
Gross Loan Growth $_{t+3}$	Growth rate of the acquirer's average gross loans over the three years following deal completion relative to the level in the year prior to the announcement.	LSEG Datastream
Private Target	Indicator equals one if the target is a private firm and equals zero otherwise.	LSEG SDC Platinum
Subsidiary Target	Indicator equals one if the target is a subsidiary and equals zero otherwise.	LSEG SDC Platinum
Technology Target	Indicator equals one if the target operates in a high-technology industry and equals zero otherwise.	LSEG SDC Platinum
Financial	Indicator equals one if the target is a financial firm and equals zero otherwise.	LSEG SDC Platinum
Domestic	Indicator equals one if the acquirer and target are located in the same country and equals zero otherwise.	LSEG SDC Platinum
All Cash	Indicator equals one if the method of payment is 100% cash and equals zero otherwise.	LSEG SDC Platinum
All Equity	Indicator equals one if the method of payment is 100% equity and equals zero otherwise.	LSEG SDC Platinum
Relative Size	Ratio of the deal value to acquirer's market value at the time of the deal.	LSEG SDC Platinum
Pre-OB Brand Value Top 500	Indicator equals one if the bank is included in the top 500 Banking Brands from Brand Finance prior to the Open Banking announcement and equals zero otherwise.	Brand Finance

Variable			Definition	Source
Pre-OB Value	High	Market	Indicator equals one if the bank's market capitalization in the year prior to the Open Banking policy announcement exceeds the top tercile among all banks in the same country and equals zero otherwise.	Compustat North America & Global
Pre-OB High Total Assets			Indicator equals one if the bank's total assets in the year prior to the Open Banking policy announcement exceed the top tercile among all banks in the same country and equals zero otherwise.	Compustat North America & Global
Pre-OB High SavedFI			Indicator equals one if the percentage of the population aged 15 and above with savings accounts at a financial institution in the bank's head-quarter country exceeds the top tercile across all countries in 2014 and equals zero otherwise.	World Bank Global Findex
Pre-OB High BorrowedFI			Indicator equals one if the percentage of the population aged 15 and above who borrowed from a financial institution in the bank's headquarter country exceeds the top tercile across all countries in 2014 and equals zero otherwise.	World Bank Global Findex
Pre-OB High Digital Payment			Indicator equals one if the percentage of the population aged 15 and above who made or received digital payments in the bank's headquarter country exceeds the top tercile across all countries in 2014 and equals zero otherwise.	World Bank Global Findex

Table A2: The Effect of Open Banking on M&A Activity Excluding the OB Announcement Year

This table reports the results of robustness checks using a restricted sample that excludes the open banking regulation announcement year. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . Treat is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. Post is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	$\text{Log}(\text{DealCount} + 1)_t$ (1)	$\text{Log}(\text{DealCount} + 1)_t$ (2)	$\text{Log}(\text{DealValue} + 1)_t$ (3)	$\text{Log}(\text{DealValue} + 1)_t$ (4)
Treat $\times$ Post	0.025*** (0.008)	0.023*** (0.008)	0.133*** (0.047)	0.124** (0.048)
Controls	No	Yes	No	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	37,874	37,874	37,874	37,874
Adjusted R^2	0.192	0.194	0.169	0.170

Table A3: The Effect of Open Banking on M&A Activity for Banks with M&A History

This table reports the results of robustness checks using a restricted sample that includes only banks that completed at least one M&A deal prior to the implementation of the Open Banking policy. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . *Treat* is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. *Post* is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	$\text{Log}(\text{DealCount} + 1)_t$ (1)	$\text{Log}(\text{DealCount} + 1)_t$ (2)	$\text{Log}(\text{DealValue} + 1)_t$ (3)	$\text{Log}(\text{DealValue} + 1)_t$ (4)
Treat $\times$ Post	0.073*** (0.015)	0.057*** (0.018)	0.399*** (0.108)	0.306** (0.120)
Controls	No	Yes	No	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	14,113	14,113	14,113	14,113
Adjusted R^2	0.101	0.106	0.080	0.085

Table A4: Poisson Model on Deal Count and Inverse Hyperbolic Sine Transformation on Deal Value

This table reports the results of robustness checks using Poisson regression on deal count and inverse hyperbolic sine transformation on deal value. $Deal\ Count_t$ represents the raw number of deals and $IHS(Deal\ Value+1)_t$ represents the inverse hyperbolic sine transformation of average value of M&A deals for each bank of the cohort in year t . $Treat$ is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. $Post$ is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	$DealCount_t$		$IHS(DealValue)_t$	
	(1)	(2)	(3)	(4)
Treat $\times$ Post	0.338*** (0.129)	0.327** (0.156)	0.162*** (0.046)	0.152*** (0.048)
Model Type	Poisson	Poisson	OLS	OLS
Lagged Controls	No	Yes	No	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	15,796	12,544	42,750	42,750
Pseudo/Adjusted R^2	0.142	0.147	0.175	0.177

Table A5: The Effect of Open Banking on M&A Activity excluding Dominant Countries

This table reports the results of robustness checks for which we exclude dominant countries in the treatment and control groups. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . *Treat* is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. *Post* is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	Panel A: Excluding EU		Panel B: Excluding the US		Panel C: Excluding EU and the US	
	$\text{Log}(\text{DealCount} + 1)_t$	$\text{Log}(\text{DealValue} + 1)_t$	$\text{Log}(\text{DealCount} + 1)_t$	$\text{Log}(\text{DealValue} + 1)_t$	$\text{Log}(\text{DealCount} + 1)_t$	$\text{Log}(\text{DealValue} + 1)_t$
	(1)	(2)	(3)	(4)	(5)	(6)
Treat $\times$ Post	0.029*** (0.007)	0.152** (0.052)	0.010** (0.005)	0.063* (0.034)	0.014** (0.005)	0.071* (0.042)
Controls	No	No	No	No	No	No
Cohort-Bank FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	41,273	41,273	28,511	28,511	26,313	26,313
Adjusted R^2	0.195	0.173	0.076	0.069	0.043	0.042

Table A6: Alternative Specifications

This table reports the results of robustness checks with alternative fixed effects and standard error clustering. $\text{Log}(\text{Deal Count}+1)_t$ represents the total number and $\text{Log}(\text{Deal Value}+1)_t$ represents the average value of M&A deals for each bank of the cohort in year t . Treat is an indicator variable that equals one if the bank in the cohort is headquartered in a country that has mandated the Open Banking policy and equals zero otherwise. Post is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include cohort-bank fixed effects and cohort-year fixed effects. Columns (2) and (4) further include lagged firm controls and lagged country controls. Table A1 in the Appendix provides detailed variable definitions. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	$\text{Log}(\text{DealCount} + 1)_t$					$\text{Log}(\text{DealValue} + 1)_t$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treat X Post	0.026*** (0.006)	0.026*** (0.006)	0.026*** (0.009)	0.026** (0.010)	0.026** (0.004)	0.144*** (0.040)	0.144*** (0.040)	0.144*** (0.047)	0.144** (0.059)	0.144** (0.015)
Controls	No	No	No	No	No	No	No	No	No	No
Cohort-Bank FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort-Industry FEs	Yes	No	No	No	No	Yes	No	No	No	No
Cohort-Industry by Year FEs	No	Yes	No	No	No	No	Yes	No	No	No
Cohort-Country Clustering	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes
Country Clustering	No	No	Yes	No	No	No	No	Yes	No	No
Country and Year Clustering	No	No	No	Yes	No	No	No	No	Yes	No
Country and Industry Clustering	No	No	No	No	Yes	No	No	No	No	Yes
Observations	42,750	42,741	42,741	42,741	42,741	42,741	42,741	42,741	42,741	42,741
Adjusted R^2	0.196	0.200	0.197	0.197	0.197	0.173	0.177	0.173	0.173	0.173

Table A7: The Impact of Open Banking on Different Types of Banks' M&A Activities

This table reports the heterogeneous treatment effects of Open Banking on different types of bank M&As. Panel A compares the treatment effects of Open Banking on the M&A deals in which the target is from a financial versus a non-financial industry. Panel B compares the effects treatment of Open Banking on domestic versus cross-border M&A deals. The dependent variables are the total number or the average value of M&A deals ($\text{Log}(\text{Deal Count}+1)$ or $\text{Log}(\text{Deal Value}+1)$) for acquirer bank i of cohort c in year t . $\text{Treat}_{c,k}$ is an indicator variable that equals one if the acquirer bank i in cohort c is headquartered in country k that has mandated the Open Banking policy and equals zero otherwise. $\text{Post}_{c,t}$ is an indicator variable that equals one if year t is in the post-event period and equals zero if it is in the pre-event period. All specifications include lagged firm and country characteristics, cohort-bank fixed effects and cohort-year fixed effects. Table A1 in the Appendix provides detailed variable definitions. Standard errors are clustered at the cohort-country level and shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Targets in Financial vs Non-Financial Industry				
Dependent Variable	$\text{Log}(\text{DealCount} + 1)_t$		$\text{Log}(\text{DealValue} + 1)_t$	
	Finc (1)	Non-Finc (2)	Finc (3)	Non-Finc (4)
Treat $\times$ Post	0.022*** (0.007)	0.002 (0.002)	0.116*** (0.044)	0.013 (0.010)
Controls	Yes	Yes	Yes	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	42,750	42,750	42,750	42,750
Adjusted R^2	0.204	0.021	0.175	0.027

Panel B: Domestic vs Cross-Border Deals				
Dependent Variable	$\text{Log}(\text{DealCount} + 1)_{i,c,t}$		$\text{Log}(\text{DealValue} + 1)_{i,c,t}$	
	Domestic (1)	Cross-Border (2)	Domestic (3)	Cross-Border (4)
Treat $\times$ Post	0.026*** (0.007)	-0.002 (0.003)	0.141*** (0.041)	-0.010 (0.023)
Controls	Yes	Yes	Yes	Yes
Cohort-Bank FEs	Yes	Yes	Yes	Yes
Cohort-Year FEs	Yes	Yes	Yes	Yes
Observations	42,750	42,750	42,750	42,750
Adjusted R^2	0.208	0.069	0.184	0.051