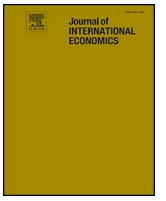
Journal of International Economics 155 (2025) 104094

Contents lists available at ScienceDirect

Journal of International Economics

journal homepage: www.elsevier.com/locate/jie



Implicit guarantees and bank stability: Evidence from a quasi-natural experiment

Anna L. Sobiech [a,b,*], Lechedzani Kgari [b,c], Linh Nguyen [b], John O.S. Wilson [b]

[a] Faculty of Management, Economics and Social Sciences, University of Cologne, Albertus-Magnus-Platz, 50923 Cologne, Germany
[b] Centre for Responsible Banking & Finance, Business School, University of St Andrews, The Gateway, KY16 9RJ St Andrews, Fife, UK
[c] Bank of Botswana, Prudential Authority and Payments Oversight Department, 17938, Khama Crescent, Gaborone, Botswana

ARTICLE INFO

Dataset link: Repository link: https://data.mendeley.com/datasets/v8fw8x3p7j/1.

Keywords:
Implicit guarantees
Bank stability
Ringfencing
Cross-border banking
Africa

ABSTRACT

Do parent bank implicit guarantees enhance or diminish the stability of foreign subsidiaries? Using a quasi-natural experiment in the form of a regulatory intervention which removed parent banks' option to provide financial support to affiliated foreign subsidiaries, we find a substantial increase in the overall default risk of foreign subsidiaries. Less stringent private and supervisory oversight in host countries exacerbates the adverse impacts on risk. Overall, the results align with the notion that a loss in implicit guarantees implies a decline in reputational capital and franchise value. Beyond financial stability, the intervention likely has economic implications. Foreign subsidiaries increase lending and deposit funding, particularly those with stronger initial capitalization. These patterns are consistent with risk-compensating behavior where subsidiaries, following the loss of parental guarantees, expand balance sheets to sustain funding and market presence. Our findings inform ongoing policy debates regarding the merits of implicit guarantees for bank stability.

1. Introduction

The relationship between corporate parents and their constituent subsidiaries is fundamental to the governance, performance, and resilience of complex organizations. Cross-border banks routinely establish subsidiaries to conduct business in foreign countries, which are subject to local regulation and supervision. In principle, the operation of stand-alone subsidiaries implies that the parent bank has limited liability toward affiliates. This allows the parent bank protection from any financial losses incurred by subsidiaries. Despite the availability of this limited liability option, for reputational reasons, cross-border banks often choose to provide financial support to subsidiaries during times of stress. The provision of financial support beyond any legal obligations implies the presence of implicit guarantees. These implicit guarantees pose challenges to regulators globally, given the potential impacts on the overall risk of cross-border banks. Consequently, there is considerable debate, but a paucity of evidence regarding the benefits and costs of implicit guarantees. Critics argue that implicit guarantees reduce market discipline, incentivize excessive risk-taking, and increase the fragility of the financial system. Advocates contend that implicit guarantees are a source of strength and conducive to prudent risk management. Ultimately, the extent to which implicit guarantees enhance or compromise bank stability remains an unanswered empirical

* Corresponding author at: Faculty of Management, Economics and Social Sciences, University of Cologne, Albertus-Magnus-Platz, 50923 Cologne, Germany.
E-mail addresses: asobiech@uni-koeln.de (A.L. Sobiech), lmk20@st-andrews.ac.uk (L. Kgari), lhn2@st-andrews.ac.uk (L. Nguyen), jsw7@st-andrews.ac.uk (J.O.S. Wilson).

https://doi.org/10.1016/j.jinteco.2025.104094
Received 16 April 2024; Received in revised form 10 April 2025; Accepted 11 April 2025
Available online 19 April 2025

question; one that we aim to answer in the present study.

Prior theoretical literature is ambiguous regarding the impacts of implicit parent bank guarantees on the risk-taking of subsidiaries. On one hand, parent bank implicit guarantees may induce excessive risk-taking by reducing incentives for creditors to monitor and discipline subsidiaries (Boot and Schmeits, 2000; Brei and Winograd, 2018). Parent bank implicit guarantees may give rise to moral hazard, leading subsidiaries to engage in riskier behavior on the presumption of being rescued by the parent in the event of distress. In the absence of market discipline, the threat of liquidation may be lower and risk-taking incentives higher. Prior evidence corroborates the notion that market discipline is lower in the presence of implicit and explicit government guarantees (Gropp et al., 2014; Brandao-Marques et al., 2020). On the other hand, parent bank implicit guarantees may moderate excessive risk-taking by enhancing reputation and charter value. Keeley (1990) shows (theoretically) that the threat of losing charter value deters excessive risk-taking. Banks that have more to lose from failing, behave more prudently. Segura and Zeng (2020) further posit that implicit guarantees incentivize banks' monitoring efforts and thereby reduce any excessive risk-taking associated with limited liability. Ueda and Di Mauro (2013) provide evidence that access to parent bank guarantees provides advantageous funding to subsidiaries. Ultimately, the net impact of parent bank implicit guarantees on the risk-taking behavior of subsidiaries depends on the relative importance of the two aforementioned views.

Our empirical strategy is based on a regulatory geographic ringfencing intervention which removed parent banks' discretion to provide financial assistance to subsidiaries in case of financial distress. The intervention, which effectively eliminated any implicit parent bank guarantees for affiliated subsidiaries in foreign countries was instituted by the Central Bank of Nigeria (CBN) in 2012. A time when new regulatory capital requirements were introduced in many African countries. Several host country supervisors demanded that foreign subsidiaries, if in need of recapitalization, should seek assistance from their parent bank. To safeguard the capital of Nigerian parent banks, the CBN prohibited parent banks from providing financial assistance to their subsidiaries. We use this intervention as a natural experiment in a difference-in-differences (DiD) framework to investigate the impact of a loss of implicit parent bank guarantees for the stability of subsidiaries. We compare the risk of subsidiaries of Nigerian parent banks with that of subsidiaries of other cross-border banks before and after the ringfencing intervention.

Our baseline sample comprises 146 bank subsidiaries based in 33 African host countries. We define "treatment" as the CBN ringfencing intervention, and divide our sample of subsidiaries into two groups according to the treatment status of the parent bank. The treated group comprises 11 subsidiaries owned by four Nigerian parent banks. The control group comprises 135 subsidiaries owned by 39 parent banks, headquartered in countries other than Nigeria, and thus not subject to the CBN ringfencing intervention.[1] We saturate our DiD-model with a comprehensive set of host-country $\times$ time fixed effects to control for any time-varying changes, and differences in host-country conditions. In order to alleviate potential concerns that differences in subsidiaries or parent banks are driving our results, we also employ propensity score matching based on an extensive set of subsidiary and parent bank characteristics. Our results are robust in the matched samples.

By way of preview, the results of our analysis suggest that the risk of subsidiaries increases following the ringfencing of parent banks. This is evidenced by a substantial increase in overall default risk. Subsidiaries become more leveraged, have higher credit risk, and are more exposed to liquidity risk following the intervention. Overall, these results are in line with the notion that parent bank implicit guarantees contribute to charter value, and as such moderate the risk-taking of subsidiaries. The CBN ringfencing intervention likely also has economic implications. We document an increase in lending and deposit funding of subsidiaries, particularly of those with stronger initial capitalization. These patterns are consistent with risk-compensating behavior—where subsidiaries, following the loss of parental guarantees, expand balance sheets to sustain funding and market presence.

We perform a series of cross-sectional tests to explore heterogeneities arising from differences in supervisory oversight and market discipline across host countries. We find considerable heterogeneity in the response of subsidiaries to the intervention. A more substantial increase in the risk of subsidiaries is observed in host countries with weaker private and supervisory oversight. This implies that implicit parent bank guarantees contribute to the stability of subsidiaries when external controls are weak.

We rule out alternative explanations for the observed increase in risk via several robustness tests. Specifically, we investigate whether changes in investors' perceptions, new capital requirements in host countries, internal capital market integration, or parent bank specific factors drive our findings. By ruling out these alternative explanations, we are confident that our research design provides a robust assessment of the impact of the ringfencing intervention on the risk of subsidiaries.

The results of our study are relevant beyond Nigeria and Africa. For example, in Europe, the global financial crisis and various sovereign debt crises left a legacy of nationally based ringfencing interventions, which have slowed progress toward achieving a fully integrated banking market (Enria and Fernandez-Bollo, 2020). As a potential way to advance the integration of banking markets in Europe, moving from a subsidiary-based organizational model (where parent banks are protected by limited liability from losses of affiliates) to a branch-based organizational model (where parent banks and affiliates operate as a unified legal entity) has been proposed (Enria, 2023). The findings of this study indicate that implementing strict subsidiarization measures, such as geographic ringfencing that eliminates implicit guarantees, can have adverse effects on the stability of subsidiaries. This underscores the potential benefits of organizational structures where parent banks extend implicit financial support to their subsidiaries. However, the optimal organizational structure depends on the institutional environment and the nature of financial shocks that prompt ringfencing

[1] We examine financial stability reports, IMF country reports, supervisory disclosures and newspaper articles from January 2010 to December 2013 to verify whether parent banks headquartered in African jurisdictions outside Nigeria faced interventions similar to the CBN ringfencing intervention. Specifically, we check for ad hoc ringfencing measures that explicitly prohibited banks from recapitalizing their foreign subsidiaries. Online Appendix A1 provides a detailed discussion of our assessment.

interventions. While subsidiarization can protect host countries from spillovers when parent banks face distress, our findings suggest that implicit guarantees from the parent play a crucial role in stabilizing subsidiaries, and that strict ringfencing during non-crisis periods may heighten financial risks. This implies that regulation should balance the benefits of financial integration with the need to minimize risk transmission.

We contribute to two important strands of literature. First, we contribute to empirical evidence regarding the impacts of guarantees on bank risk-taking. Most evidence produced to date focuses on the role of government guarantees. The existing evidence is mixed, with some studies finding that government guarantees reduce market discipline and increase risk-taking, while others find evidence for lower risk-taking, consistent with the notion that government guarantees enhance bank charter value.[2] We augment and complement this literature by evaluating the role of financial guarantees in the bank parent-subsidiary context. Using an extensive cross-country panel of bank parents and subsidiaries, we provide evidence regarding the importance of implicit parent bank guarantees for the risk-taking of affiliated foreign subsidiaries.

Owing in large part to an absence of suitable empirical settings, there is a paucity of empirical evidence regarding the impacts of geographic ringfencing on cross-border banks. Two earlier simulation-based investigations by Cerutti et al. (2010) and Cerutti and Schmieder (2014) find that ringfencing has a negative impact on the solvency of European banks. The authors find that stricter forms of ringfencing (such as fully restricted intra-group transfers) result in a greater need for capital at the parent and subsidiary level. Our results confirm these findings. However, by studying the CBN ringfencing intervention, we can examine actual, rather than simulated bank behavior. Our results suggest that subsidiaries' response to the ringfencing intervention is not homogeneous, but rather depends on prevailing market discipline and supervisory oversight in host countries.

The remainder of the paper is organized as follows. Section 2 provides an historical background of cross-border banking in Africa and describes the setting used as the basis of the research design employed. The dataset and empirical model are presented in Section 3. Section 4 discusses the results, examines confounding factors and heterogeneous effects. Section 5 presents robustness tests, while Section 6 concludes.

2. Background

2.1. Cross-border banking in Africa

Cross-border banks operating in Africa comprise non-African and Pan-African banks. Pan-African banks are indigenous to Africa and operate either under a widespread network spanning the continent, or are more regionally oriented, confining cross border activities in close proximity to their home country. Over the past two decades, Pan-African banks expanded to overtake long established European and American banks with a presence in Africa (Beck and Cull, 2014; Beck, 2015; Beck et al., 2015; Enoch et al., 2015).[3] In many African countries, the subsidiary-based organizational structure dominates. Subsidiaries typically operate in host countries with limited integration across the banking group (Beck et al., 2014; Zins and Weill, 2018b). In comparison to non-African banks, Pan-African banks focus more on traditional financial intermediation activities based on deposit taking and lending (Nguyen et al., 2016), while their ownership of subsidiaries is associated with higher bank risk (Kanga et al., 2020).

2.2. Geographic ringfencing by the CBN

Geographic ringfencing imposes geographical constraints or limitations on the operations of cross-border banks. The aim is to contain risks within specific geographic regions, thus preventing the transmission of financial distress across borders. Geographic ringfencing measures range from short-term ad-hoc restrictions to long-term structural changes that aim to contain capital and liquidity within national borders (Goldberg and Gupta, 2013; D'Hulster and Ötker-Robe, 2015; Enria and Fernandez-Bollo, 2020). These can be implemented in response to crises or as a pre-emptive measure to prevent financial instability. While geographic ringfencing is considered prudent for insulating domestic banks from foreign shocks (Claessens, 2019; Fillat et al., 2023), this view neglects the potential source of strength of intra-group financial support during crises (De Haas and Van Lelyveld, 2010; Cetorelli and Goldberg, 2012; Cerutti and Schmieder, 2014).

The CBN ringfencing intervention is an ad-hoc, safeguarding measure that was implemented at a time of no acute banking crisis. In May 2012, the central bank prohibited Nigerian parent banks from recapitalizing *foreign* subsidiaries incorporated and operating outside Nigeria. From the date of the announcement, the measure became immediately effective. These guarantees were withdrawn for all Nigerian parent banks and their constituent foreign subsidiaries without exception and without any transition period (Central Bank of Nigeria, 2012). Importantly, the CBN imposed this restriction uniformly across institutions, regardless of their individual financial condition. In other words, the policy treatment was applied consistently, even though ex-post capital needs may have varied across

[2] Gropp et al. (2014) find that German savings banks have lower credit and funding risk after the abolishment of government guarantees. In a similar vein, Hagendorff et al. (2018) and Brandao-Marques et al. (2020) find a positive link between government support and bank risk taking. These results support the notion that guarantees increase bank risk-taking through reduced market discipline. In contrast, Körner and Schnabel (2013) and Fischer et al. (2014) find that the removal of government guarantees increases bank funding costs and risk-taking.

[3] Prior studies investigating the impact of Pan-African bank expansion, provide evidence in support of: lower cyclicality in lending (Zins and Weill, 2018a); efficiency improvements (Zins and Weill, 2018b); increased competition (Léon, 2016); and increased financial inclusion (Beck, 2015; Léon and Zins, 2020). Pan-African bank expansion leads to greater bank stability in some countries, and fragility in others (Kanga et al., 2021).

subsidiaries. For our difference-in-differences approach, we consider treatment to be represented by the removal of *implicit guarantees.* These are guarantees that had not yet materialized but were nevertheless expected by subsidiaries to be available in times of need.

3. Method and data

3.1. Model

We use a difference-in-differences approach to identify the impact of the CBN ringfencing intervention on the stability of subsidiaries. Specifically, we compare the risk of treated and control subsidiaries in the pre- and post-regulatory intervention period. Treated subsidiaries are those located in host countries, and owned by Nigerian parent banks subject to the intervention in 2012 and 2013. Control subsidiaries are owned by parent organizations unaffected by the intervention. We estimate nested versions of Eq. (1):

$$y_{i,b,j,t} = \beta_1 \underbrace{(treated_{i,b} * post_t)}_{RINGF_{i,b,t}} + \beta_2 X_{i,t-1} + \beta_3 P_{b,t-1} + \theta_{j,t} + \delta_t + \gamma_i + \epsilon_{i,b,j,t} \quad (1)$$

where *i, b, j,* and *t* denote foreign subsidiary, parent bank, host country and time. The dependent variable, *y*, is the so-called *Z*-score, a measure applied widely in the salient literature (Laeven and Levine, 2009; Houston et al., 2010; Beck et al., 2013). The Z-score measures a bank's distance from insolvency, and is defined as the sum of the return on assets and the capital asset ratio in relation to the standard deviation of asset returns. We calculate the Z-score as:

$$\text{Z\_score}_{it} = \frac{\text{ROA}_{it} + \text{CAR}_{it}}{\sigma \text{ROA}_{it}}$$

Higher values imply that a bank is more stable (less risky), and further from default. In order to reduce the skewness of the distribution, we take the natural logarithm of the Z-score (Lepetit and Strobel, 2013). To allow for time variation in the denominator of the Z-score, we compute the standard deviation, σROA_i using a five-year rolling window.

The indicator variable *treated* equals one if a foreign subsidiary has a Nigerian parent, and zero otherwise. The *post* variable equals one for the two-year period following enactment of the ringfencing intervention, and zero for the two-year period preceding. The treatment indicator $RINGF_{i,t}$ equals one for Nigerian subsidiaries in the years after 2011, and zero otherwise. β_1, our coefficient of interest, captures the impact of the ringfencing intervention on risk.

We control for time-varying subsidiary-specific factors likely to affect foreign subsidiaries' stability. $X_{i,t-1}$ are subsidiary specific controls. We use size *(Size)* as well as the ratio of loans to assets (*Loans)*, and the ratio of loans to deposits (*Loan-to-deposit ratio*) to account for differences in subsidiary size, the composition of assets, and the loan and deposit profile of subsidiaries (Bhagat et al., 2015). *Liquidity* is included to account for subsidiaries' liquidity constraints. We also include *Earnings,* defined as the ratio of non-interest operating income to total operating income to account for the share of income from activities other than lending (Demirgüç-Kunt and Huizinga, 2010). We also include the ratio of *non-deposit* to total assets to measure the extent to which a subsidiary is funded via non-deposits (Khan et al., 2017). *Merger* is an indicator variable that captures merger and acquisition activity of subsidiaries, and equals one in the year of a merger, and zero otherwise. To allow for heterogeneous responses to the ringfencing intervention by foreign subsidiaries, we also estimate a version of Eq. (1) where we interact all subsidiary and parent control variables with the *post* indicator.

Parent bank-level controls, $P_{i,t-1}$, are included to address concerns that the ringfencing intervention may coincide with shocks related to the capital and liquidity of parent banks. We control for parent bank liquidity and capital. We also add time fixed effects δ_t to Eq. (1) to control for time-varying effects. Alternatively, we use time effects interacted with host-country fixed effects, $\theta_{j,t}$. In doing so, we control for any changes in host-country conditions (such as economic shocks, capital inflows or changes in regulatory capital requirements) that may interfere with the ringfencing intervention. Our model is estimated using two-way-fixed effects with multiple levels of fixed effects (Correia, 2017). Robust standard errors clustered at the parent level are used to account for within-parent bank correlation (Arellano, 1987). Abadie et al. (2023) show that the treatment assignment mechanism determines the correct level of clustering. Given that the treatment varies at the parent level, we choose to cluster at this level. $\epsilon_{i,b,j,t}$ is a stochastic error term.

We also investigate whether factors specific to the host country mitigate or exacerbate the impact of the ringfencing intervention. To do so, we estimate Eq. (2) (an augmented version of Eq. (1)) where we interact the dichotomous treatment effect variable *RINGF* with ex-ante differences in supervisory oversight and market discipline in host countries, *HostC*.

$$y_{i,b,j,t} = \beta_1 RINGF_{i,b,t} \times HostC_{j,2011} + \beta_2 RINGF_{i,b,t} + \beta_3 X_{i,t-1} + \beta_4 P_{b,t-1} + \theta_{j,t} + \gamma_i + \epsilon_{i,b,j,t} \quad (2)$$

3.2. Data

We collect balance sheet, income statement, and ownership data for bank subsidiaries operating in Africa from Fitch Connect. Our analytical sample period spans from 2010 to 2013, covering both the pre-intervention period (2010−2011) and post-intervention

period (2012−2013) surrounding the CBN ringfencing intervention implemented in 2012.[4] We limit the sample to affiliates that operate as foreign commercial bank subsidiaries, excluding branches and non-bank entities. We manually collect information regarding the ownership structure of each subsidiary during the sample period from bank websites and annual reports. Consistent with prior cross-border banking literature, we define a foreign bank subsidiary as one in which the parent bank owns 50 % or more of the shares. For host country supervisory characteristics, we use indicators sourced from the Barth et al. (2013) supervisory dataset. Definitions of these indicators are provided in Section A2 (Online Appendix).

A key assumption underlying our research design is that foreign subsidiaries in the treated and control group are relatively homogeneous in their financial characteristics prior to treatment. To alleviate concerns that pre-treatment differences in characteristics could drive our results, we use four different samples of banks as well as a propensity score matching approach. In Section A3 (Online Appendix), we provide a description of these four samples. Table A3.1 depicts the geographic composition of each sample and reports the number of control units. Summary statistics for each sample are provided in Table A3.2 Panel A.

4. Empirical results

4.1. Baseline results

Table 1, Columns 1 to 6 present the results from estimating Eq. (1) with the *Z*-score as the dependent variable. The first column shows the results of the basic difference-in-differences specification with subsidiary-level control variables, subsidiary fixed effects and time effects. The coefficient on the treatment variable, *RINGF*, is negative and statistically significant. In Column 2, we also control for parent bank characteristics, and add host-country × time fixed effects. The coefficient in Column 2 is negative and takes the value of −0.981, suggesting that the Z-score decreases. For comparison, the within-subsidiary variation in the Z-score for the average subsidiary in the full sample over the period from 2008 to 2011 is 0.595 (see Table A3.2 Panel B). In order to allow for possible heterogeneous responses to the ringfencing intervention, we interact all foreign subsidiary-level and parent-level control variables with *post*. The results are reported in Column 3. In Columns 4, 5, and 6, we use the same regression specification as in Column 2, but utilize alternative samples. The estimated coefficient on *RINGF* is negative and remains statistically significant across various specifications. Overall, the negative coefficients on *RINGF* in Columns 1 through 6 suggest that subsidiaries owned by Nigerian parent banks have higher risk relative to control group subsidiaries after the ringfencing intervention. Lower Z-scores imply a higher probability of bank insolvency, suggesting that subsidiaries of Nigerian parent banks became less stable following the ringfencing intervention. These results suggest that parent bank implicit guarantees increase bank charter value, and mitigate excessive risk-taking of foreign subsidiaries.

4.2. Alternative risk measures and dynamics

An exploration of how the ringfencing intervention impacts several types of bank risk is of significant policy interest. We employ three alternative risk measures that capture the credit, liquidity, and leverage risk of foreign subsidiaries. In Section A2 (Online Appendix), we provide specific details on the composition of the aforementioned risk proxies. We estimate Eq. (1) using the three alternative risk measures. From the results presented in Table 2, we observe that the ringfencing intervention impacts credit, liquidity, and leverage risk. The coefficients in Columns 1, 2, and 3 for credit, liquidity, and leverage risk respectively, are positive and statistically significant. Credit, liquidity and leverage risk increase by 58 %, 23 % and 7 % respectively. For comparison, the within-bank variation for the average foreign subsidiary in the full sample over the period from 2008 to 2011 is 62 % for credit risk, 16 % for liquidity risk, and 5 % for leverage risk (see Table A3.2 Panel B). Columns 4 to 12 report the coefficients for the alternative samples. The coefficients remain positive and consistent throughout.

Next, we examine the dynamics for subsidiary risk using the four risk measures. Fig. 1 depicts the cumulative effects of the ringfencing intervention on the *Z*-score (Panel A), credit risk (Panel B), liquidity risk (Panel C), and leverage risk (Panel D). To analyze the dynamic effects of the ringfencing intervention, we interact the treatment indicator – *treated* – with relative time dummies that are equal to one if the observation falls in period ρ relative to the intervention year 2012, and zero otherwise. The omitted period ($\rho = -1$) is the year before the intervention. Dots represent point estimates, while grey vertical lines are uniform 90 % confidence intervals. The results suggest that the ringfencing intervention had an immediate negative impact on the stability of foreign subsidiaries. Notably, the effects persisted for up to four years following the ringfencing intervention for the Z-score. For liquidity risk and credit risk, the effects abate after approximately three years, while for leverage risk, the effects last beyond the fourth year, indicating a more prolonged adjustment phase. However, risk impacts do not extend beyond the fifth year, suggesting that while the ringfencing intervention initially impacted risk, this increase was not permanent.

4.3. Heterogeneous effects

The results reported in the previous sections suggest a strong link between implicit parent bank guarantees and subsidiaries' risk. In this section, we examine whether subsidiaries' responses to the CBN ringfencing intervention varies according to the degree of external

[4] Our raw dataset spans from 2005 to 2019. To compute the *Z*-score, we use rolling averages over a five-year window. Given this specification, observations prior to 2009 do not have sufficient historical data for calculation.

Table 1
Baseline results.

	(1)	(2)	(3)	(4)	(5)	(6)
	Z-score	Z-score	Z-score	Z-score (PAB)	Z-score (Within-country)	Z-score (PS-match)
RINGF (*Treated* × *Post*)	−0.509***	−0.981***	−1.310***	−1.120***	−0.628**	−1.131***
	(0.108)	(0.274)	(0.333)	(0.283)	(0.246)	(0.284)
Size	0.667*	0.467	0.445	0.337	1.180	2.178**
	(0.332)	(0.345)	(0.360)	(0.553)	(0.769)	(0.818)
Liquidity	−0.488	0.323	0.795	1.361	−0.0391	0.630
	(0.392)	(0.408)	(0.546)	(1.050)	(0.740)	(0.920)
Earnings	−0.0603	−0.0422	0.262	0.574	0.759	−0.185
	(0.272)	(0.335)	(0.455)	(0.531)	(0.537)	(0.616)
Loan-deposit	−0.316	−0.0310	−0.0960	0.177	−0.656	−1.821**
	(0.367)	(0.404)	(0.540)	(0.766)	(0.541)	(0.716)
Non-deposit	−1.256	−1.233	−0.255	−1.486	0.163	−0.153
	(0.810)	(0.777)	(1.057)	(1.796)	(1.943)	(1.866)
Liquidity (parent)		−3.952***	−4.918***	−3.925***	−4.310***	−5.039***
		(0.829)	(1.350)	(0.860)	(1.274)	(0.628)
Capital (parent)		−3.084	−3.456	−2.682	6.626	−6.138
		(3.288)	(4.085)	(3.517)	(5.055)	(6.104)
Merger		−0.0507	−0.0904	−0.183	−0.0822	−0.346
		(0.196)	(0.196)	(0.184)	(0.284)	(0.472)
Observations	460	417	417	241	152	105
Adj. R-squared	0.1000	0.7255	0.7239	0.6642	0.7485	0.6885
Subsidiary FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	No	No	No
Year*Country FE	No	Yes	Yes	Yes	Yes	Yes
Subs. ctrls × *Post*	No	No	Yes	No	No	No
Parent ctrls × *Post*	No	No	Yes	No	No	No
Cluster	Parent	Parent	Parent	Parent	Parent	Parent

This table reports the results from estimating Eq. (1). The explanatory variable of interest is *RINGF*, an indicator variable that is equal to one in year 2012 and 2013 for foreign subsidiaries of Nigerian parent banks and zero otherwise. The dependent variable in Columns 1 to 6 is the Z-score (log). In Column 1, we use OLS and include subsidiary-level control variables comprising the lagged values of size, liquidity, earnings, loan-deposit ratio, and the ratio of non-deposit to total assets. We also use subsidiary fixed effects and time effects. In Column 2, we use the estimator by Correia (2017) for high-dimensional fixed effects. We include parent-level control variables comprising capital ratio and liquidity and introduce host country*time fixed effects. In Column 3, we add interaction terms of *post* with foreign subsidiary covariates as well as parent covariates. In Column 4, 5 and 6 we use the PAB sample, within-country sample, as well as the PS-matched sample, respectively (see Section A3 for a detailed description of these samples). See Section A2 (Online Appendix) for variable definitions. Robust standard errors clustered at the parent level are reported in parentheses. ***, **, *, indicate significance at the 1 %, 5 %, and 10 % level, respectively.

oversight in the host country. In order to investigate this proposition, we examine whether market discipline and supervisory oversight in host countries mitigates or exacerbates the impact of the ringfencing intervention. Prior evidence suggests that government guarantees weaken the threat of bankruptcy and lead to higher risk-taking, given that creditors have less incentive to monitor banks when their investments are protected (Gropp et al., 2014; Berger and Turk-Ariss, 2015; Brandao-Marques et al., 2020). Consequently, the prevailing level of private and public oversight of banks (in the form of market discipline and banking supervision) in host countries is likely to impact the risk-taking of foreign subsidiaries following the ringfencing intervention.

To explore heterogeneities in the responses of subsidiaries to the CBN ringfencing intervention, we collect data on host-country characteristics that capture differences in market discipline and bank supervision. Using the database by Barth et al. (2013), we focus on the set of variables classified as *official supervisory action*, which capture the degree of supervisory power, independence, discretion, and stringency (Section A2 of the Online Appendix provides definitions). We create binary variables that are equal to one if our proxies are indicative of low supervisory oversight or market discipline, and zero otherwise. We consider supervisory oversight and market discipline to be low if the index values are below the mean. All variables are measured as at 2011, and as such capture ex-ante differences in private and supervisory oversight. As outlined in Section 3.1, we interact these dummy variables with *RINGF*, the dichotomous treatment effect variable (as defined in Eq. (2)).

Table 3 Columns 1 to 10 report the results from estimating Eq. (2) with the *Z*-score as the dependent variable. We begin with variables related to supervisory oversight. The coefficients on the interaction terms are negative and statistically significant in Columns 1 through 5 (with the exception of restructuring power in Column 2). The results suggest that the response of foreign subsidiaries to the ringfencing intervention depends on ex-ante supervisory oversight. Foreign subsidiaries exhibit higher risk in countries where banking supervisors have less power to deal with failing banks, are less independent from government, and show more leniency toward the elevated credit risk of banks. We observe higher risk of foreign subsidiaries following the ringfencing intervention in countries where supervisors have higher discretion and may engage in forbearance when confronted with violations of laws and imprudent bank behavior. For market discipline, we observe that the coefficients for the interaction terms in Columns 6 and 7 are negative and statistically significant. This suggests that the impact of the ringfencing intervention is somewhat more pronounced in host countries with weaker private market oversight, although the effects related to market discipline are overall less robust than for supervisory oversight.

Table 2
Credit, liquidity, and leverage risk.

	Full sample			PAB sample			Within-country sample			PS-matched sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Credit risk	Liquidity risk	Leverage risk	Credit risk	Liquidity risk	Leverage risk	Credit risk	Liquidity risk	Leverage risk	Credit risk	Liquidity risk	Leverage risk
RINGF (*Treated* × *Post*)	0.578**	0.225***	0.0693**	0.634**	0.152*	0.0712**	0.551*	0.284**	0.0498**	0.381*	0.253*	0.0521**
	(0.264)	(0.0762)	(0.0268)	(0.298)	(0.0784)	(0.0284)	(0.269)	(0.100)	(0.0219)	(0.195)	(0.133)	(0.0222)
Observations	323	410	420	178	235	244	143	153	155	107	108	108
Adj. R-squared	0.137	0.809	0.732	0.026	0.751	0.585	0.190	0.817	0.607	0.319	0.694	0.490
Subsidiary FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subsidiary controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parent controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent

This table reports the results from estimating Eq. (1). The explanatory variable of interest is *RINGF*, an indicator variable that is equal to one in year 2012 and 2013 for foreign subsidiaries of Nigerian parent banks and zero otherwise. The dependent variables in Columns 1, 2, and 3 are credit risk, liquidity risk, and leverage risk respectively. Columns 4, 5, and 6 show results for the PAB sample. Columns 7, 8, and 9 show results for the within-country sample. Columns 10, 11, and 12 show the results for the PS-matched sample. See Section A2 (Online Appendix) for variable definitions. Robust standard errors clustered at the parent level are reported in parentheses. ***, **, *, indicate significance at the 1 %, 5 %, and 10 % level, respectively.

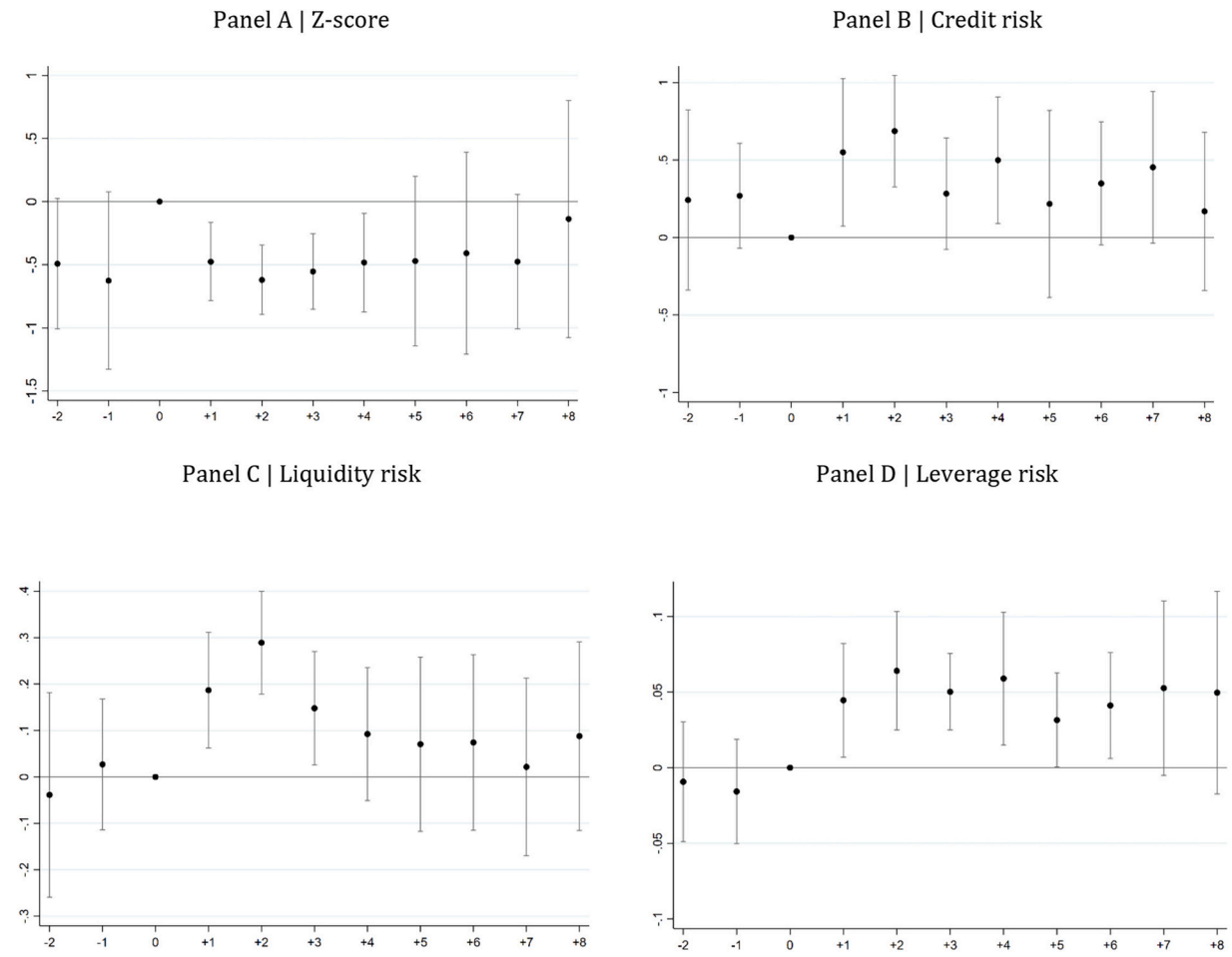


Fig. 1. Dynamic effects.

Overall, the results of our analysis suggest that the response of foreign subsidiaries to the CBN ringfencing intervention depends on the level of market discipline and banking supervision in host countries. This highlights considerable heterogeneity in the responses of subsidiaries to the ringfencing intervention. Specifically, the ringfencing of parent banks adversely affects the stability of foreign subsidiaries. This is particularly pronounced in host countries with less private sector monitoring and supervisory oversight.

4.4. Economic implications and the role of initial capitalization

The observed changes in subsidiaries' risks are likely to carry broader economic implications. To examine this dimension, we focus on lending and deposit funding of subsidiaries, and thus on the fundamental role subsidiaries play as providers of liquidity to the economy. In theory, the increase in subsidiary risk could correspond with an expansion or contraction in lending. Lending may increase if subsidiaries seek to offset diminished access to parent support by shifting toward higher-yielding, riskier assets, and by accessing alternative funding sources such as deposits. Better-capitalized subsidiaries may have greater capacity to expand lending and attract funding in response to the shock. Conversely, lending may decrease if capital constraints lead subsidiaries to tighten credit supply, and funding pressures limit their ability to extend new loans.

To investigate the economic implications of the intervention, we re-estimate Eq. (1) using four subsidiary-level outcome variables. These comprise two measures of lending - the ratio of net loans to equity and the ratio of net loans to total assets - and two measures of deposit funding - the ratio of deposits to total assets and the ratio of interbank deposits to total assets. The net loans to equity ratio measures the relative share of the loan portfolio to equity capital, while the net loans to total assets ratio provides insights regarding the allocation of assets to loans relative to other investments. The deposit and interbank deposit to assets ratio measure the proportion of a bank's total assets that are financed through customer deposits and interbank deposits respectively.

Table 4 Panel A presents the results from estimating Eq. (1). In Columns 1 and 2, the positive significant coefficients on *RINGF* indicate that treated subsidiaries increase lending after the ringfencing intervention. In Column 3, the coefficient is positive and weakly statistically significant, suggesting that subsidiaries increase funding via customer deposits. The coefficient in Column 4 is close

Table 3
Heterogeneous effects - the role of market and supervisory oversight.

	Supervisory Oversight (Columns 1–5)					Market Oversight (Columns 6–10)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score
RINGF (*Treated* × *Post*)	−0.468***	−0.822***	−0.709***	−0.758***	−0.896***	−0.493***	−0.548***	−0.871***	−0.748***	−0.796***
	(0.105)	(0.243)	(0.244)	(0.180)	(0.261)	(0.130)	(0.155)	(0.276)	(0.231)	(0.228)
RINGF × *PrmtCorrPwr*	−0.957**									
	(0.363)									
RINGF × *Restrucpwr*		−0.844								
		(0.521)								
RINGF × *SupIndPolitical*			−0.638*							
			(0.370)							
RINGF × *LoanClassStrin*				−1.538**						
				(0.631)						
RINGF × *ProvStrin*					−0.547*					
					(0.296)					
RINGF × *SupForbear*						−0.788**				
						(0.346)				
RINGF × *MoralHazard*							−0.714**			
							(0.275)			
RINGF × *IntCreditRating*								−0.341		
								(0.543)		
RINGF × *AccontingPractice*									−0.724	
									(0.431)	
RINGF × *ExtRatiCredMonit*										−0.510
										(0.557)
Observations	417	417	417	417	417	417	417	417	417	417
Adj. R-squared	0.727	0.726	0.726	0.730	0.725	0.726	0.726	0.724	0.726	0.725
Subsidiary FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subsidiary controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parent controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent	Parent

This table reports the results from estimating Eq. (2) using the full sample. The explanatory variable of interest *RINGF* interacted with host-country characteristics capturing differences in supervisory oversight and market discipline. Interaction terms in Columns 1 through 10 are dummy variables that are equal to one if country-specific value is below the mean measured across all countries and zero otherwise. For a full list of variable definitions see Section A2 (Online Appendix). *RINGF* is an indicator variable that is equal to one in year 2012 and 2013 for foreign subsidiaries of Nigerian parent banks and zero otherwise. Robust standard errors clustered at the parent level are reported in parentheses. ***, **, *, indicate significance at the 1 %, 5 %, and 10 % level, respectively.

to zero and not statistically significant, indicating that the intervention did not affect interbank deposits. Overall, the findings suggest that subsidiaries increase lending and deposit funding after the CBN ringfencing intervention.

In general, we would expect that better-capitalized subsidiaries are likely to be better positioned to absorb the loss in implicit guarantees, and thus may respond differently relative to less well capitalized counterparts. To examine whether the impact of the ringfencing intervention varies by subsidiaries' initial capitalization, we estimate Eq. (3):

$$y_{i,b,j,t} = \beta_1 RINGF_{i,b,t} \times Capital_{i,2010/11} + \beta_2 RINGF_{i,b,t} + \beta_3 X_{i,t-1} + \beta_4 P_{b,t-1} + \theta_{j,t} + \gamma_i + \epsilon_{i,b,j,t} \quad (3)$$

The outcome variables, $y_{i,b,j,t}$ are the four previously used risk measures as well as the measures of lending and deposit funding. The interaction term $Capital_{i,2010/11}$ measures the average capital of subsidiary i in the pre-treatment period.

Table 4 Panel B shows the results for the risk measures. The coefficient for the interaction term $RINGF_{i,b,t} \times Capital_{i,2010/11}$is only statistically significant in Column 4, indicating that leverage risk increased relatively more for subsidiaries with higher initial capital. For the other risks (Columns 1 to 3), the effect is largely independent of initial capitalization levels. Table 4 Panel C presents the results for lending and deposit funding. In Column 1, both the baseline and interaction terms are positive and statistically significant, indicating that the increase in the loan-to-equity ratio is stronger for better-capitalized subsidiaries. In Column 2, only the baseline effect is positive and significant, suggesting that all subsidiaries, regardless of initial capitalization, shift their asset composition toward loans. In Column 3, only the interaction term is significant, indicating that the increase in deposits is driven primarily by better-capitalized banks.

Our findings indicate that the loss of implicit guarantees uniformly increases credit risk, liquidity risk, and solvency risk (measured by the *Z*-score) among subsidiaries. This likely reflects that these types of risk are primarily shaped by regulatory standards and external market conditions, rather than by marginal differences in capitalization. Since Nigerian subsidiaries were generally above critical capitalization thresholds at the time of the intervention (see Online Appendix Fig. A5.2), incremental variations in capital were likely less relevant for these particular risks. By contrast, our findings indicate that capitalization differences do significantly affect leverage and deposit funding. This suggests that better-capitalized subsidiaries were more able to expand their balance sheets in

Table 4
Economic implications and the role of initial capitalization.

	(1)	(2)	(3)	(4)
Panel A	*Net loans/Equity*	*Net loans/TA*	*Deposits/TA*	*Interbank deposits/TA*
RINGF (*Treated* × *Post*)	1.422***	0.0556***	0.0477*	0.00598
	(0.507)	(0.0135)	(0.0271)	(0.0192)
Observations	420	420	420	377
Adj. R-squared	0.889	0.895	0.795	0.568
	(1)	(2)	(3)	(4)
Panel B	*Z-score*	*Credit risk*	*Liquidity risk*	*Leverage risk*
RINGF (*Treated* × *Post*)	−0.985***	0.5024*	0.213***	0.0330*
	(0.318)	(0.2504)	(0.0575)	(0.0194)
$RINGF \times Capital_{2010/11}$	0.00840	0.1447	0.0207	0.0614***
	(0.191)	(0.2037)	(0.0626)	(0.00697)
Observations	417	323	410	420
Adj. R-squared	0.724	0.133	0.808	0.775
	(1)	(2)	(3)	(4)
Panel C	*Net loans/Equity*	*Net loans/TA*	*Deposits/TA*	*Interbank deposits/TA*
RINGF (*Treated* × *Post*)	1.090*	0.0522***	0.0152	0.0003
	(0.542)	(0.0168)	(0.0256)	(0.0120)
$RINGF \times Capital_{2010/11}$	0.559**	0.00575	0.0549***	0.0081
	(0.263)	(0.0125)	(0.0181)	(0.0165)
Observations	420	420	420	377
Adj. R-squared	0.889	0.895	0.795	0.568
Subsidiary FE	Yes	Yes	Yes	Yes
Host-country*Time FE	Yes	Yes	Yes	Yes
Subsidiary controls	Yes	Yes	Yes	Yes
Parent controls	Yes	Yes	Yes	Yes
Cluster	Parent	Parent	Parent	Parent

Panel A presents results from estimating Eq. (1) with the dependent variables net loans to equity; net loans to total assets; deposits to total assets; interbank deposits to total assets. *RINGF* is an indicator variable that is equal to one in year 2012 and 2013 for foreign subsidiaries of Nigerian parent banks and zero otherwise. Panel B of this table presents results from estimating Eq. (3) using the full sample. $Capital_{2010/11}$ measures the average subsidiary capital (equity to total assets) in the pre-treatment period. The dependent variables in Columns 1 to 4 of Panel B are: Z-score, credit risk, liquidity risk, and leverage risk. Panel C presents results from estimating Eq. (3) with the dependent variables net loans to equity; net loans to total assets; deposits to total assets; interbank deposits to total assets. See Section A2 (Online Appendix) for variable definitions. Robust standard errors clustered at the parent level are reported in parentheses. ***, **, *, indicate significance at the 1 %, 5 %, and 10 % level, respectively.

response to ringfencing intervention. The increase in risk and lending following the ringfencing intervention is consistent with the notion that subsidiaries, facing the loss of implicit parent support, reallocated their portfolios toward potentially higher-yielding, riskier assets. The finding that better-capitalized subsidiaries expanded lending and leverage more strongly supports the interpretation that initial capital levels enhanced their capacity to absorb the effects of the intervention.

5. Confounding factors

This section provides a summary of the robustness tests, with detailed analysis and discussion presented in the Online Appendix. Overall, the tests confirm the validity of our findings. We systematically assess potential confounding factors, including differences in initial conditions and regulatory environments.

5.1. Investor perceptions

To address concerns that changes in investor perceptions could confound our findings, we conduct several robustness tests (see Appendix A5.1 for details). First, we analyze subsidiary funding conditions using financial statement data. We find no evidence of increased borrowing costs post-intervention. Second, an event study on publicly listed parent banks shows no significant negative stock price reaction following the ringfencing intervention. Third, we examine parent bank credit ratings and find no downgrades that would indicate a deterioration in perceived solvency. Finally, a review of supervisory reports and news sources reveals no heightened regulatory concerns about specific subsidiaries of Nigerian parent banks in their host countries.[5]

5.2. New capital requirements

We also conduct a robustness check to assess whether new regulatory capital requirements in host countries are a confounding factor (see Appendix A5.2 for details). When excluding subsidiaries subject to higher capital requirements in 2012, we find that the observed increase in risk persists. This suggests that the ringfencing intervention, rather than new capital regulations drives the results.

5.3. Internal capital market flows

We examine whether internal capital market flows between parent banks and foreign subsidiaries confound our results by focusing on geographical distance as a proxy for integration (see Appendix A5.3 for details). We find no significant relationship, suggesting that risk increases regardless of internal capital market integration. This supports the notion that the observed risk increase stems from a loss in implicit parent bank guarantees rather than actual liquidity constraints.

5.4. Parent bank lobbying

We address concerns regarding the potential endogeneity of the ringfencing intervention (see Appendix A5.4 for details). Specifically, we rule out the possibility that certain parent banks may have influenced policy decisions by lobbying for ringfencing as a strategic means to detach from risky subsidiaries. Our findings confirm the robustness of the original results.

5.5. Additional control variables

We investigate the sensitivity of our results to the inclusion of additional variables that control for time-varying factors at the parent-bank and home-country level (see Appendix A5.5 for details). For instance, we include a measure of profitability and loan risk at the parent level as well as measures of macro-economic conditions such as employment change and GDP growth. Overall, the results remain consistent with our baseline estimation.

5.6. Placebo test, alternative clustering, sample period

We perform a comprehensive set of additional sensitivity checks to further validate our main findings. See Appendix A5.6 for details on these tests. First, to address concerns about placebo or anticipation effects, we implement a placebo test by assuming falsely that the ringfencing policy was introduced two years earlier (in 2010 instead of 2012). Second, to ensure that our findings are not sensitive to clustering assumptions, we conduct additional tests using alternative clustering at the home-host country pair level. Finally, we verify whether the length of the sample period influences our results, considering policy adjustments signalled by the CBN in 2013. Overall, the coefficients remain statistically significant and consistent with our baseline estimations.

[5] We thank an anonymous reviewer for drawing our attention to this important confounding factor.

6. Conclusion

Cross-border banks routinely create separate subsidiaries to operate in foreign countries. This provides the parent bank with a degree of financial protection in instances of financial distress experienced by a foreign subsidiary. However, despite this option, banks often choose to support subsidiaries during periods of financial distress, effectively providing implicit financial guarantees with important implications for the risk of foreign subsidiaries. We investigate the impact of a regulatory intervention in Nigeria in 2012, which strengthened the limited liability of parent banks by removing the option to provide financial support to foreign subsidiaries. We use this regulatory intervention to investigate the role of implicit parent bank guarantees for the risk of foreign subsidiaries. The results of our analysis suggest that the intervention led to increased risk across foreign subsidiaries, particularly in countries with weaker banking supervisory oversight. This finding holds across various risk measures.

While our analysis is centered on the African banking context, regulatory ringfencing has been a recurring policy response to crises in various jurisdictions. In Europe, for example, post-crisis measures have slowed banking integration, reigniting discussions on the trade-offs between subsidiarization and financial stability (Enria and Fernandez-Bollo, 2020). As such, the wider implications of our study resonate with ongoing debates on cross-border banking regulation. While institutional contexts differ, the fundamental dynamics of parent-subsidiary relationships and the consequences of limiting intra-group support are widely relevant. By providing empirical evidence from an African setting, this study offers insights that inform regulatory discussions beyond its immediate regional focus.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors thank two anonymous referees and editor Martín Uribe as well as Angela Gallo, Arito Ono, David Marques, Hirofumi Uchida, Iichiro Uesugi, Louis Nguyen, Paul Hark, Wolf Wagner, and participants at the Hitotsubashi University Workshop on Banking, and at the 2023 Muenster Bankenforschungsworkshop for useful comments and suggestions.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jinteco.2025.104094.

Data availability

A replication package containing the code and key data outputs used in the analysis is available at: “RINGF”, Mendeley Data, V1, doi: 10.17632/v8fw8x3p7j.1.

References

Abadie, A., Athey, S., Imbens, G.W., Wooldridge, J.M., 2023. When should you adjust standard errors for clustering? Q. J. Econ. 138 (1), 1–35.
Arellano, M., 1987. Computing robust standard errors for within-groups estimators. Oxf. Bull. Econ. Stat. 49 (4), 431–434.
Barth, J.R., Caprio Jr., G., Levine, R., 2013. Bank regulation and supervision in 180 countries from 1999 to 2011. J. Financ. Econ. Pol. 5 (2), 111–219.
Beck, T., 2015. Cross-border banking and financial deepening: the African experience. J. Afr. Econ. 24 (suppl_1), i32–i45.
Beck, T., Cull, R., 2014. Banking in Africa. In: Berger, A.N., Molyneux, P., Wilson, J.O.S. (Eds.), Oxford Handbook of Banking, 2nd edition. Oxford University Press, Oxford.
Beck, T., De Jonghe, O., Schepens, G., 2013. Bank competition and stability: cross-country heterogeneity. J. Financ. Intermed. 22 (2), 218–244.
Beck, T., Fuchs, M., Singer, D., Witte, M., 2014. Making Cross-Border Banking Work for Africa. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany.
Beck, T., Senbet, L., Simbanegavi, W., 2015. Financial inclusion and innovation in Africa: an overview. J. Afr. Econ. 24 (suppl_1), i3–i11.
Berger, A.N., Turk-Ariss, R., 2015. Do depositors discipline banks and did government actions during the recent crisis reduce this discipline? An international perspective. J. Financ. Serv. Res. 48, 103–126.
Bhagat, S., Bolton, B., Lu, J., 2015. Size, leverage, and risk-taking of financial institutions. J. Bank. Financ. 59, 520–537.
Boot, A.W., Schmeits, A., 2000. Market discipline and incentive problems in conglomerate firms with applications to banking. J. Financ. Intermed. 9 (3), 240–273.
Brandao-Marques, L., Correa, R., Sapriza, H., 2020. Government support, regulation, and risk taking in the banking sector. J. Bank. Financ. 112, 105284.
Brei, M., Winograd, C., 2018. Credit Risk of Foreign Bank Branches and Subsidiaries in Argentina and Uruguay. Working Paper.
Central Bank of Nigeria, 2012. Circular BSD/DIR/GEN/RFS/024. Central Bank of Nigeria, Lagos.
Cerutti, E., Schmieder, C., 2014. Ringfencing and consolidated banks’ stress tests. J. Financ. Stab. 11, 1–12.
Cerutti, E., Ilyina, A., Makarova, Y., Schmieder, C., 2010. Bankers without borders?: implications of ringfencing for European cross-border banks. International Monetary Fund Working Paper, Number 2010/247.
Cetorelli, N., Goldberg, L.S., 2012. Liquidity management of US global banks: internal capital markets in the great recession. J. Int. Econ. 88 (2), 299–311.
Claessens, S., 2019. Fragmentation in global financial markets: good or bad for financial stability? BIS Working Paper, Number 815.
Correia, S., 2017. Linear Models with High-Dimensional Fixed Effects: An Efficient and Feasible Estimator. Duke University Working Paper.
De Haas, R., Van Lelyveld, I., 2010. Internal capital markets and lending by multinational bank subsidiaries. J. Financ. Intermed. 19 (1), 1–25.
Demirgüç-Kunt, A., Huizinga, H., 2010. Bank activity and funding strategies: The impact on risk and returns. J. financ. econ. 98 (3), 626–650.

D'Hulster, K., Ötker-Robe, I., 2015. Ringfencing cross-border banks: an effective supervisory response? J. Bank. Regul. 16, 169–187.
Enoch, C., Mathieu, C., Mecagni, M., 2015. Pan-African Banks: Opportunities and Challenges for Cross-Border Oversight. International Monetary Fund, Washington.
Enria, A., 2023. The integration of EU banking sector and the challenges of global competition. EUROFI Mag. 56–58. September 2023.
Enria, A., Fernandez-Bollo, E., 2020. Fostering the Cross-Border Integration of Banking Groups in the Banking Union. European Central Bank Supervision Blog.
Fillat, J.L., Garetto, S., Corea-Smith, A.V., 2023. Global banking and the international transmission of shocks: a quantitative analysis. J. Int. Econ. 145, 103808.
Fischer, M., Hainz, C., Rocholl, J., Steffen, S., 2014. Government guarantees and bank risk taking incentives. ESMT Working Paper Number 14-02.
Goldberg, L.S., Gupta, A., 2013. Ringfencing and "financial protectionism" in international banking. In: Liberty Street Economics, 9th January 2013..
Gropp, R., Gruendl, C., Guettler, A., 2014. The impact of public guarantees on bank risk-taking: evidence from a natural experiment. Rev. Finance 18 (2), 457–488.
Hagendorff, J., Keasey, K., Vallascas, F., 2018. When banks grow too big for their national economies: tail risks, risk channels, and government guarantees. J. Financ. Quant. Anal. 53 (5), 2041–2066.
Houston, J.F., Lin, C., Lin, P., Ma, Y., 2010. Creditor rights, information sharing, and bank risk taking. J. Financ. Econ. 96 (3), 485–512.
Kanga, D., Murinde, V., Soumaré, I., 2020. Capital, risk and profitability of WAEMU banks: does bank ownership matter? J. Bank. Financ. 114, 105814.
Kanga, D., Murinde, V., Soumaré, I., 2021. How has the rise of Pan-African banks impacted bank stability in WAEMU? J. Int. Financ. Mark. Inst. Money 73, 101364.
Keeley, M.C., 1990. Deposit insurance, risk, and market power in banking. Am. Econ. Rev. 80 (5), 1183–1200.
Khan, M.S., Scheule, H., Wu, E., 2017. Funding liquidity and bank risk taking. J. Bank. Financ. 82, 203–216.
Körner, T., Schnabel, I., 2013. Abolishing public guarantees in the absence of market discipline. Ruhr Economic Papers, No. 437. Available at:. https://doi.org/10.2139/ssrn.2325287.
Laeven, L., Levine, R., 2009. Bank governance, regulation and risk taking. J. Financ. Econ. 93 (2), 259–275.
Léon, F., 2016. Does the expansion of regional cross-border banks affect competition in Africa? Indirect evidence. Res. Int. Bus. Financ. 37, 66–77.
Léon, F., Zins, A., 2020. Regional foreign banks and financial inclusion: evidence from Africa. Econ. Model. 84, 102–116.
Lepetit, L., Strobel, F., 2013. Bank insolvency risk and time-varying Z-score measures. J. Int. Financ. Mark. Inst. Money 25, 73–87.
Nguyen, M., Perera, S., Skully, M., 2016. Bank market power, ownership, regional presence and revenue diversification: evidence from Africa. Emerg. Mark. Rev. 27, 36–62.
Segura, A., Zeng, J., 2020. Off-balance sheet funding, voluntary support and investment efficiency. J. Financ. Econ. 137 (1), 90–107.
Ueda, K., Di Mauro, B.W., 2013. Quantifying structural subsidy values for systemically important financial institutions. J. Bank. Financ. 37 (10), 3830–3842.
Zins, A., Weill, L., 2018a. Cyclicality of lending in Africa: the influence of bank ownership. Emerg. Mark. Rev. 37, 164–180.
Zins, A., Weill, L., 2018b. Do Pan-African banks have the best of both worlds? Econ. Syst. 42 (4), 665–681.